A COMPARISON OF THE RATING OF DEFECTIVE SPEECH BY PARENTS, TEACHERS, AND SPEECH THERAPISTS

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ABSTRACT

A COMPARISON OF THE RATING OF DEFECTIVE SPEECH BY PARENTS, TEACHERS, AND SPEECH THERAPISTS

by Lynda Lee Macaulay

The purpose of this study is to analyze the results obtained from a group of parents, elementary classroom teachers and public school speech therapists as they rated thirty-six children with defective articulation.

The raters for this study were twelve parents of children under nine years of age, twelve elementary teachers, and twelve public school speech therapists. The raters evaluated thirty-six samples of articulatory defective speech on a seven point scale. The rating sessions for the groups of parents and classroom teachers were conducted in several small groups while the therapist session was conducted in a single group session.

The findings of this study indicate the parent and teacher groups differ significantly from the speech therapist group in the rating of articulatory defective speech. The classroom teachers generally rated the children the most severely and reported the greatest standard deviation which indicated the most diversified range of scores. The ratings of the parent group seemed to be more similar to those of the teachers than the therapists.

The public school speech therapists tended to rate the speech samples the lowest in severity which was indicated by the mean scores. The therapist group, with the lowest reported standard deviation revealed the most consistent scoring, thus indicating the most narrow range of scores.

The conclusions which were drawn from this study suggest the possibility that parents and teachers are capable of locating children having articulatory defective speech. Although the parents and teachers might tend to overrate the severity of the problem, it is most likely that they will notice an articulatory deviation in a child's speech.

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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

The contemplation of the realm of rating of speech disorders is likely to evoke a number of questions of both a clinical and philosophical nature. It is possible that one might be interested in the situations which foster speech ratings; the personal motivations which appear to elicit an evaluation of speech; or perhaps, the criterion by which an individual's speech is evaluated. No matter from what perspective the area of speech rating is examined, whether one is a professional person, self-employed, a salaried, or hourly employee, all individuals as they go about their daily living will at sometime make an evaluation of another person's speech. In accord with this general theme, Perrin states:

> Many times, persons who are neither speech therapists nor have taken an academic course in speech therapy find they must judge the relative defectiveness or normalcy of another's speech.[1]

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[1]Elinor H. Perrin, "The Rating of Defective Speech by Trained and Untrained Observers," Journal of Speech and Hearing Disorders, XIX (March, 1954), 48.

This theme was elaborated upon, with the suggestion that parents evaluate their child's speech when considering a referral to a speech clinic; teachers, when referring a child to the speech therapist; and friends, when they find themselves judging the improvement of the child's speech following speech therapy.[2]

As one views the role of the public school speech therapist one of the most important duties is to locate children who need help with their speech. One means of accomplishing this is to accept for diagnostic testing those children recommended by the classroom teacher. Ainsworth[3] suggests this method is advantageous as it saves the time of the therapist. Van Riper states, "Many systems prefer to have the classroom teachers select the cases with whom the speech correction teacher is to work."[4]

Thus, some view the teacher referral method as a means of saving the speech therapist's time, which in turn facilitates the early beginning of therapy sessions. We also see the influence of the school system becoming evident in the recommendation of the teacher referral method.

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[2]Ibid.

[3]Stanley Ainsworth, Speech Correction Methods (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956), p. 29.

[4]Charles Van Riper, Speech Correction Principles and Methods (3rd ed.; Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956), p. 530.

Edney[5] writes of accepting teacher referrals not as a matter of efficiency but as a means of encouragement in the over-all area of teacher relations. He views the area of teacher referrals as just one means of helping the classroom teacher become "a cooperating member of the speech correction team."[6]

Thus, it is possible to conclude that the speech of a child is evaluated by some of the individuals in his environment and that at times the child is made aware of this rating of his speech. It is quite possible the parents and classroom teachers inflict the most intense influence upon the child when they function as the source of referral to the speech therapist. Consequently, it is feasible to assume that an objective speech evaluation is necessary not only for the good of the child but also as a means of assistance to the speech therapist.

Much investigation has been conducted in the area of trained versus untrained raters and/or observers, but little work has been done to study the relationships of the parent, teacher, and therapist evaluations of speech disorders. This is an area which is of importance when considering the potential needs of the child, the efficiency of the public school therapy program, and the significance of parent and teacher referrals to the speech therapist.

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[5]Wendell Johnson, Speech Handicapped School Children (rev. ed.; New York: Harper and Brothers, 1956), p. 425.

[6]Ibid.

Statement of Problem and Purpose of Study

The problem from which this study arose is that of determining the reliability of parent and teacher speech referrals as evidenced in the public school situation. The purpose of this study is to analyze the results obtained from parents, teachers, and therapists in which ratings were made of thirty-six children. From this analysis it is hoped that answers to the following questions can be obtained:

1. How aware are parents of childrens' speech difficulties?
2. To what extent are classroom teachers aware of childrens' speech problems?
3. To what extent do parents and classroom teachers agree in their awareness of speech difficulties?
4. How closely do the speech evaluations made by teachers and parents agree with those of the public school speech therapist?

Hypotheses

To answer the above questions, the following null hypotheses have been proposed:

1. There is no significant difference between parents' and classroom teachers' ratings in their evaluation of an elementary child's articulatory disorder.

2. Parents and therapists do not differ significantly in the rating of children's articulatory disorders.
3. There is no significant difference between teachers' and therapists' ratings of elementary childrens articulatory disorders.

Importance of the Study

As mentioned previously, one of the most important duties of the public school speech therapist is to locate children who are defective in their speech. One method of locating these children is through the use of the teacher referral method.

There appears to be some controversy regarding the merits of this method. Ainsworth[7], and Edney[8] suggest the teacher referral method is second best to that of the method of survey. However, Suydam[9] found twenty-four percent of the public school speech therapists in the Middle West relied completely on the teacher referral method. Oyer[10], makes the inference, dependent upon skills evident in the senior year of college work,

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[7]Ainsworth, loc. cit.

[8]Johnson, loc. cit.

[9]Vanetta R. Suydam, "Speech Survey Methods in Public Schools," Journal of Speech and Hearings Disorders, XIII (March, 1948), 52.

[10]Herbert J. Oyer, "Speech Error Recognition Ability," Journal of Speech and Hearing Disorders, XXIV (November, 1959), 394.

that elementary teachers might perform well in the selection of children having speech disorders.

A study conducted by Diehl and Stinnett[11] revealed that teachers having no orientation in speech disorders located less than sixty percent of the children diagnosed as having defective speech.

In view of the existing controversy regarding the teacher referral method (which will be discussed at greater length in Chapter II) and the reported percentage of speech therapists dependent upon this method, it appears most feasible to determine the amount of agreement between classroom teachers and speech therapists in relation to the selection of children in need of speech therapy. Additionally, it was deemed relevant to compare the relationship of parents' ratings of defective speech with those of teachers and therapists.

Definition of Terms

For the purpose of this study the terms used are defined as follows:

Parent(s).--Individuals whose children range in age from two to nine years.

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[11]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), 36.

Teacher(s).--Individuals academically trained for instruction in the elementary school (grades kindergarten through sixth) who have taught a minimum of one year in the elementary situation and were teaching at that level during the time of the study.

Therapist(s).--Individuals academically prepared for speech therapy work and actively engaged in public school speech therapy during the school year preceding the study.

Speech Defective.--A child with a functional articulatory defect comprised of omission, substitution and/or distortions with no known organic involvement.

Severe Articulatory Disorder.--Speech characterized by fractionation of from eight to sixteen sounds with concommitant vowel distortions.

Moderately Severe Disorder.--Speech characterized by fractionation of from six to eight sounds with no concurrent vowel distortions.

Slight Articulatory Disorder.--Speech characterized by fractionation of from two to five sounds with no vowel distortion.

Organization of the Thesis

Chapter I has presented the statement of the problem which served as a basis for this study. It has consisted of an introduction to the topic and a discussion of the purpose. Stated also in Chapter I have been

several hypotheses of which this study is concerned. A discussion of the importance of the study has been presented along with a definition of the terms which will be used throughout the study.

Chapter II will contain a review of the literature pertinent to the area of the study.

Chapter III will be composed of a presentation and discussion of the subjects, equipment, materials, and procedures of the recording and rating sessions used in this study.

Chapter IV will be concerned with a presentation and discussion of the results of the study.

Chapter V will contain the summary and conclusion of this study.

CHAPTER II

A REVIEW OF THE LITERATURE

Introduction

A review of the literature revealed three general areas pertinent to the theme of the researcher's study. It was deemed important by the researcher to review these areas, because the methods and results reported by the administrators appeared to have a direct relevance to the development and administration of the researcher's study. It was the researcher's intent to present the studies cited in the literature regarding the measuring and scaling of articulation defectiveness, the rating of defective speech, and teacher recognition and referral of speech defective children.

Within the area of the measuring and scaling of articulation defectiveness, the researcher was interested in determining the methods of analysis utilized by the authors and the results indicated by their investigations.

The area of the rating of defective speech was reviewed to determine background information regarding trained versus untrained observers and their reactions to speech samples.

A review of the studies pertaining to teacher recognition and referral of speech defective children was conducted to determine background information in order to develop a frame of reference for the evaluation of the researcher's study.

The Measuring and Scaling of Articulation Defectiveness

A study designed by Morrison[1] investigated the reliability of the measures of articulation defectiveness which were obtained by the method of equal-appearing intervals from the responses of two groups of observers to short segments of continuous speech. Additionally, Morrison attempted to construct a severity scale of articulation defectiveness with recorded short segments of continuous speech. Both a preliminary and major investigation were conducted in which a one minute recording of sixty-six children (45 boys and 21 girls) with speech ranging from normal to severe edited to five, ten, and fifteen second segments were rated by both naive and sophisticated groups. The naive group consisted of undergraduates enrolled in an elementary speech course while the sophisticated group was made up of advanced

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[1]Sheila Morrison, "Measuring the Severity of Articulation Defectiveness," Journal of Speech and Hearing Disorders, XX (December, 1955), 347-351.

students in speech pathology who were trained and experienced in the clinical evaluation of articulation defects.

The results of the preliminary investigation for five, ten, and fifteen second segments of speech samples revealed the following three tendencies: (1) the sophisticated group tended to rate the segments slightly more severely than did the naive listeners; (2) the t tests revealed there were no significant differences; and (3) the results indicated a high agreement between the sophisticated and naive raters with respect to the relative placement of the segments along the severity continuum for each of the three lengths of the segments.

The results of the major investigation further substantiated these results as the administration of the Pearson r and t test reported a correlation of .98 for the ten second and .97 for the five second segments. The difference between the means was found to be non-significant at .11, thus indicating there was no significant difference in the rating of five, ten,and fifteen seconds or longer presentations of speech samples.[2]

The results of the Morrison study proposed the question of whether reliable scale values determining the

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[2] Ibid.

severity of articulation defectiveness could be attained from the responses of an individual observer? Sherman and Morrison[3] conducted a study to determine this aspect of measuring of articulatory defectiveness.

A tape recording of fifty, one-minute recordings of voices ranging in defectiveness from slight to severe was employed as rating material with selection based upon three observers' agreement of the absence of extraneous stimuli which might interfere with valid judgments of articulatory defectiveness. The observers were defined as individuals with considerable experience in clinical speech correction. The investigation utilized two groups of ten individuals comprised of students enrolled in an advanced speech pathology course. Training sessions of one and one-half hours in length preceeded the experimental judging session. In the training sessions the groups listened to a previously prepared severity scale then rated the speech segments on a nine point equal-appearing intervals scale. Following this procedure the raters were given the previously established level of severity after which they again rated the presentations.

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[3]Dorothy Sherman and Sheila Morrison, "Reliability of Individual Ratings of Severity of Defective Articulation," Journal of Speech and Hearing Disorders, XX (December, 1955), 352-358.

An additional forty minute session preceded and followed the experimental listening session in which seventy-five segments of continuous speech were rated. This was an experimental listening session for both the ten second and five second segments of continuous speech.

On the basis of this study, the authors presented four conclusions. The first was that the responses of trained individual observers to one minute speech samples does result in reliable mean scale values regarding the severity of articulatory defectiveness. The second conclusion was that it is possible to obtain responses of mean scale values from a trained individual observer which are precise in regard to the placement of one minute speech samples in relative position along the severity continuum. It was also concluded by the authors that a single individual's absolute values of severity measures of defective articulation are not necessarily comparable to that of another individual. The final conclusion proposed was that it is possible to obtain as reliable mean scale values from both the five and ten second segment presentations regarding the severity of defective articulation as anticipated from longer speech samples.[4]

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[4] Ibid.

Another mode of measuring the defectiveness of articulation mentioned in the literature is that of direct magnitude-estimation.

A study was designed by Prather[5] which investigated the relevance of the method of direct magnitude-estimation to the scaling of articulation defectiveness. The observers participating in the study were 200 students enrolled in an elementary psychology course divided into five groups. Six conditions were developed in regard to a comparison of the severity of the standard stimulus, and the influence of the frequency of presentation of the standard stimulus. Prather reported several results regarding the relevance of the direct magnitude-estimation approach to the scaling of articulation defectiveness. She indicated the observer's scale values were not dependent upon the experimenter's assignment of a specific point or value to the standard stimulus. Additionally, the study determined that scales values are not influenced when left to the discretion of the observer. However, Prather noted the scale values tended to vary according to the number of specific points assigned to the standard stimulus because the scale tended to be relatively extended at the upper end

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[5]Elizabeth M. Prather, "Scaling Defectiveness of Articulation by Direct Magnitude-Estimation," Journal of Speech and Hearing Research, III (December, 1960), 380-392.

with the assignment of 100 points. The results also indicated there was no important advantage in the frequent presentation of the standard stimulus as compared to that of a single presentation at the beginning of a listening session.

The Rating of Defective Speech

Within this portion of the review of literature it was the researcher's intent to determine a frame of reference and the relevance of trained and untrained observer responses to the rating of speech.

Burgi and Matthews[6] utilized trained and untrained observers in their investigation regarding the effects of listeneral sophistication upon the global ratings of speech behavior. The master tape recording employed in the listening sessions consisted of two readings of a single paragraph by twenty-two subjects diagnosed as multiple sclerotic whose speech ranged from very intelligible to almost unintelligible. The carrier phrase "This is pair number _____" prefaced each group of two presentations. Four groups of listeners rated the paired presentations. One group was composed of ten students enrolled in a beginning university speech pathology

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[6]Ernest J. Burgi and Jack Matthews, "Effects of Listener Sophistication Upon Global Ratings of Speech Behavior," Journal of Speech and Hearing Research, III (December, 1960), 348-352.

course who had had no previous courses in this area. The second group of listeners was composed of seven full time undergraduate students enrolled in a second level speech pathology course. Another group consisted of eighteen teachers with more listening experience than the undergraduate group but enrolled in a similar second level course in speech pathology. The fourth group was composed of seven speech pathology graduate students. The administration of the Burgis and Matthews study consisted of a set of oral instructions regarding the use of the rating sheet, and a practice pair of speech samples which prefaced the presentation of the speech samples in the listening sessions. During the four listening sessions, the second sample of each pair was compared to that of the first sample in the pair. A five point scale was utilized in which zero denoted a great deal worse and four a great deal better. The researchers made no attempt to use high fidelity equipment or a soundproofed room. An analysis of the differences among the mean ratings of each group resulted in no significant differences. However, the correlations between the mean ratings for each subject within each group were found to be significantly different from each other. The study further indicated no significant differences between trained and untrained listener groups relevant to the

global or over-all rating of the speech behavior presented by the tape recording.[7]

During the rating of speech one could possibly become interested in the relationship of an articulation test result and the individual's speech rating. A study administered by Jordan[8] investigated the relationships between articulation test measures and listener ratings of articulation defectiveness. Jordan's purpose was to analyze the relationships between certain factors associated with defective articulation and the listener's reactions which were indicated by the ratings of the listeners regarding the severity of defective articulation in short samples of children's speech. The method of a multiple regression analysis was utilized to evaluate the relationship between twenty-two measures of defectiveness of articulation obtained from a phonetic analysis of 150 children's articulation test responses and those measures of defectiveness of articulation obtained from listener ratings of short samples of connected speech. Jordan reported four outstanding results of his study. The first was that the articulation test responses, under the conditions of

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[7] Ibid.

[8] Evan P. Jordan, "Articulation Test Measures and Listener Ratings of Articulation Defectiveness," Journal of Speech and Hearing Research, III (December, 1960), 303-319.

the experiment, provided valid information regarding articulatory behavior in connected speech. It was reported that the influence of defective articulation upon the listener appeared to be dependent upon both the frequency with which the articulatory deviation occurred and the extent of the articulatory deviation. The third result, as stated by Jordan, was that omissions were found to be more deviant than substitutions, and substitutions more deviant than distortions. The fourth result indicated that the articulation test measures regarding the number of defective items and the number of defective single sounds were found to be highly related to the measures of defectiveness as derived from the listener reactions to connected speech.[9]

A study similar to the Jordan study was conducted by Perrin[10] which was concerned with determining the amount of difference in the rating of defective speech by trained and untrained observers. The subjects evaluated were seven children between the ages of nine and thirteen who had functional articulatory problems consisting of substitution, omission, and distortion. The speech severity, which was determined by the experimenter from the recorded speech, ranged on a scale of from zero to

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[9] Ibid.

[10] Perrin, op. cit., pp. 48-51.

five. The raters consisted of trained and untrained individuals. The untrained group were twenty-six college students in an introductory psychology course (ages 17-27) with no course work in speech therapy or pathology. The trained group was composed of thirteen graduate students, enrolled in a clinical methods course of speech correction (ages 21-50) who had completed previous courses in the area of speech therapy. In analyzing the results of the study, the rank order of each rater's preferences was determined. The rank orders for both the trained and untrained were then determined by assigning points to each raters' response in which the least defective voice received one point and the most severe assigned a weight of five. (In case of tie, the numbered points were averaged between the tied number.) The rank order correlation co-efficient between the ranks assigned the trained and untrained groups was .822, significant at the four percent level of confidence. The rank order for the trained group was found to be in close agreement with the objectively counted number of misarticulated sounds. The correlation co-efficient between the rank order obtained from the actual count of articulatory errors and the judges' ranking were .983 for clinicians (significant as the one percent level of confidence) and .822 for non-clinicians (significant at the four percent level.) Both

groups agreed that the speaker with no errors was least defective and the speaker with five errors was the most defective. It was noted there were inconsistencies among both groups as evidenced by the large number of tied rankings. A greater percent of the untrained observers than the trained showed no ties.[11]

Thus far, the studies presented have been concerned with the relationships between articulation testing and listener reactions. A study by Schaffer[12] was concerned particularly with the aspects of listener reactions with no attempt to analyze the relevance to articulation testing. Six professional clinicans and six non-clinicians rated a recording of stuttering, cleft palate, and articulatory defective speech. One-half of the judges rated "attention speech calls to itself," and half rated "understandability." Several results were reported by Schaffer. The results indicated the ratings of the clinicians and non-clinicians regarding understandability indicated no significant difference between the two groups. However, significant differences were noted in the analysis of the ratings regarding

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[11] Ibid.

[12] E. Schaffer, "An Investigation of the Ratings of Speech Clinicians and Non-Clinicians on two Aspects of Defective Speech," M.S. Thesis, University of Pittsburg, 1951, cited by Elinor H. Perrin, "The Rating of Defective Speech by Trained and Untrained Observers," Journal of Speech and Hearing Disorders, XIX (March, 1954), 48.

the rating aspect of "attention speech calls to itself." It was also reported that the correlation between the average ratings made by the clinicians on understandability and attention was found to be significant at the one percent level of confidence. The correlation between the average ratings made by non-clinicians on the two aspects was found to be non-significant at the five percent level of confidence. No significant differences were noted in the reliability of either group's ratings of the "understandability" aspect of the study. However, a significantly higher reliability was noted in the ratings of the clinician group regarding the "attention" aspect of rating than what was indicated by the results of the non-clinician group.[13]

A study conducted by Schaef and Matthews[14] reported a slightly different relationship between the clinician and non-clinician groups. This study utilized a pre and post therapy recording of twenty stutterers which the clinician and non-clinician groups rated, using a five point scale. The recording was rated according to three conditions which were (1) the severity of stuttering (which was based upon the rater's personal criteria);

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[13] Ibid.

[14] Robert Schaef, and Jack Matthews, "A First Step in the Evaluation of Stuttering Therapy," Journal of Speech and Hearing Disorders, XIX (December, 1954), 467-473.

(2) the amount of tension in the recorded voice; and (3) the amount of unfavorable attention the speech calls to itself. Schaef and Matthews presented several results of their study. The inter-judge correlations for the non-clinician group was found to be significantly higher than for the group of clinicians. A comparison of the ratings of both groups to the evaluations stated by the clinicians who originally handled the sugjects in therapy, indicated a uniformity of rating for both groups which was evident in all three criterian conditions.

Teacher Recognition and Referral of Children

There are several studies of teacher recognition and referral of children with defective speech in the literature.

A study conducted by Oyer[15] assessed the speech error recognition ability of two groups of college seniors. The null hypothesis stated was "There is no significant difference in speech error recognition ability between seniors in elementary education and seniors in speech and hearing therapy." One group of raters consisted of twenty seniors majoring in speech and hearing therapy. The other was comprised of twenty seniors majoring in

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[15]Oyer, op. cit. pp 391-394.

elementary education who had completed one course in speech problems. The subjects rated by these groups were six boys and girls who were judged by their public school speech therapists to be typical examples of articulation problems. Judgments were made by both groups regarding the accuracy of the production of certain consonant sounds in selected words. A recording was previously made of each child uttering the complete list of words, which was presented in the listening sessions.

Several conclusions were stated by Oyer, the first being that the *t* scores obtained were found to be significant at the .05 percent level of confidence, which indicated the stated hypothesis could not be rejected. Additionally, Oyer felt it possible to infer that elementary teachers might well serve in the selection of cases if their skills remained in the proportion evidenced in his study.

Another study cited in the literature which appeared to indicate further tendencies of teacher referrals was conducted by Diehl and Stinnett[16] with an investigation of the efficiency of teachers referrals in a school speech testing program. Using the second grade in twenty-one

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[16]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.

school districts, the second grade teachers completed a questionaire regarding each child's general school history and noted whether the child had a speech of voice problem. No attempt was made by the investigators to define or classify the various aspects of the area of speech defects. Following a lapse of time, allowing for the completion of the questionaire, two certified speech therapists using Van Riper's criteria for speech defectives examined all the second grade children. On the basis of this study, the authors reported that the elementary grade teachers with no orientation in speech disorders located less than sixty percent of the children. They suggested that teachers can be expected to fail to identify two out of every five children with speech disorders. However, it was noted that the severe types of articulatory defectives could be located by the teacher with eighty percent accuracy. The least amount of skill evidenced by the teachers in this study was in recognizing the areas of a voice disorder in a second grade child. Additionally, the study indicated that the teachers recognized speech defects in both sexes equally well. The final conclusion reported by the authors was that in-service training programs are justified for teachers to help them identify and recognize speech defectives.[17]

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[17] Ibid.

On the basis of the two previous studies and their reported results, it was felt important by the writer to determine the methods of referral which have been used successfully in the school situation. A study conducted by Suydam[18] was designed to discover the methods used successfully in the public school to locate children and to evaluate these methods in terms of efficiency and general usefulness. Additionally, she attempted to determine the desirability of the speech survey method as a means of locating speech defective children. The results of the Suydam study indicated four principle methods extensively used to locate speech defective children in the public school. The first method stated was the referral, or the process by which teachers, principals, parents, and others refer the child for a speech evaluation. The second method stated was the speech survey, or the process by which the speech therapist personally evaluates the speech of all the children in a particular classroom or school. A combination of the methods of referral and survey comprised the third method reported in the study. The final method stated was that of voluntary enrollment. Suydam found that seventy-five percent of the speech therapists cooperating

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[18]Suydam, op. cit., 51-54.

with this study indicated they used the speech survey method alone or in combination with the method of teacher referral. Twenty-four percentof the public school therapists indicated they were totally dependent upon the teacher referral method.

Summary

Summarizing, a review of the literature produced a wealth of information pertinent to the researcher's study which can be categorized into the three areas of measuring and scaling defectiveness of articulation, the rating of defective speech, and teacher recognition and referral of children with defective speech.

Within the area of the measuring and scaling defectiveness of articulation, the studies by Morrison,[19] and Sherman and Morrison[20] indicated, with the use of the method of equal appearing intervals, that ratings of speech based upon speech samples of five, ten, and fifteen second segments are as reliable as that expected of a longer speech presentation. In addition, Sherman and Morrison[21] reported that the responses of trained individual observers relevant to the severity of

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[19]Morrison, loc. cit.

[20]Sherman and Morrison, loc. cit.

[21]Ibid.

articulation defectiveness result in reliable mean scale values. Prather[22] employed the method of direct magnitude-estimation and reported its limitations and applicability to the scaling of articulation defectiveness.

The area of the rating of defective speech had to do with an investigation of the various studies designed to determine the relationships apparent in the rating of speech between trained and untrained observers. Burgi and Matthews[23] reported no significant differences between the trained and untrained groups relevant to the global rating of speech. Jordan[24] investigated the relationship between a phonetic analysis of speech defectiveness and listener reactions and reported evidence of a high relationship which appeared to be dependent upon the frequency and degree of speech deviation. A study conducted by Perrin,[25] which determined the amount of difference in the rating of speech between trained and untrained observers, indicated both groups agreed on the speaker with the most errors and the least defective speaker. Schaffer[26] conducted an investigation

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[22]Prather, loc. cit.

[23]Burgi and Matthews, loc. cit.

[24]Jordan, loc. cit.

[25]Perrin, loc. cit.

[26]Schaffer, loc. cit.

of listener reactions to defective speech. The ratings of both the clinician and non-clinician groups regarding the "understandability" aspect of rating indicated no significant difference between the groups. However, significant difference was noted between the groups' ratings in regard to the "attention speech call to itself" aspect of rating.

The teacher recognition and referral of children aspect of the researcher's review of the literature revealed a study by Oyer[27] which indicated a possibility that elementary teachers might well serve as a source of referral for speech defective children. The Diehl and Stinnett[28] study which determined the efficiency of teacher referrals indicated that the elementary teacher with no orientation in speech disorders could be expected to fail to identify two out of every five speech defective children. A study designed by Suydam[29] to determine the methods used successfully in the public school indicated that four methods were being utilized by speech therapists. Seventy-five percent of the speech therapists stated they used the speech survey alone or in combination with the method of teacher referral. Approximately twenty-four

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[27]Oyer, loc. cit.

[28]Diehl and Stinnett, loc. cit.

[29]Suydam, loc. cit.

percent of the therapists indicated they were totally dependent upon the teacher referral method. The remaining therapists indicated that they had no systematized method for locating speech defective children.

CHAPTER III

SPEAKER SUBJECTS, RATER SUBJECTS, EQUIPMENT, MATERIALS, AND PROCEDURES

Introduction

This study was conducted in the Melvindale-Northern Allen Park public school system (near Detroit, Michigan) of approximately 5,000 school population. The children involved in the development of the master tape recording were selected from the researcher's case load and received parental permission preceding their participation in the study. The participants involved in making the ratings were parents, teachers, and speech therapists mostly from outside the school district who volunteered their time and cooperation in order to make this investigation possible.

This chapter has the specific purpose of presenting a detailed discussion regarding the selection of the speaker and rater subject's manner of participation; and the equipment, and materials which were utilized throughout the study.

Speaker Subjects

Thirty-six elementary age children chosen from the examiner's school case load comprised the subjects for the

development of the master tape recording. The total group consisted of eleven girls and twenty-five boys ranging in age from six to ten years. The children were selected to conform to the three general groups of slight, medium, and severe articulation disorders. Slight is defined, for the purpose of this study, to consist of from two through five misarticulated sounds. Moderately severe consists of speech ranging from six through eight sounds misarticulated with no vowel distortion involvement. Severe is defined as consisting of from eight sounds with concommitant vowel distortion to sixteen misarticulated sounds. It was deemed necessary to use three groupings to insure having a complete representation of the total range of articulatory disorders.

Rater Subjects

There are three specific types of individuals that compose the group of rater subjects participating in this study.

One, is the parent group, the selection of which was based upon the following requirement. All were required to have at the time of the study, one or more children younger than nine years of age. This criterion was deemed necessary as it was believed that the evaluations reported by parents living with young children and consequently exposed to the patterns of

developing speech would be of greater significance to the study than ratings by parents whose children were beyond the age of nine years. It was believed that this criterion would tend to eliminate any errors which could be attributed to the parents' inability to recall their child's developing speech patterns. The age stipulation seemed most feasible because parent referral and interest in the development of speech is most frequently centered upon the early elementary grades.

Classroom teachers comprised another group of rater subjects. The selection of the teachers was based upon two criteria:

1. They must be academically trained for the elementary level of instruction.
2. They must be teaching, at the time of the study, in an elementary grade. (Defined as kindergarten through the sixth grade.)

These criteria were set because it was felt important to use teachers who were exposed to young children and their speech patterns. It was the researcher's belief that this is most often the level during which much speech therapy is conducted and the level at which the method of teacher referral is most frequently used. It was felt that the investigation should be limited to the speech ratings reported by elementary classroom teachers since this is the most feasible level of

instruction at which developing speech patterns are likely to be exhibited by the children.

The third group of rater subjects consisted of public school speech therapists. The selection of the therapists was based upon:

1. Academic preparation in the field of speech therapy.
2. Employment in public school speech therapy the year preceding the study.

The importance of the trained speech therapists is self-evident. It was felt best to select therapists who had completed one year or more in a public school therapy program as they would be familiar with the public school situation, caseload, and difficulties.

Although no formal hearing screening was administered to the group of rater subjects, all participants were judged to have normal hearing based upon the researcher's observation of their adequacy in understanding speech in a conversational situation.

Equipment

Tape Recorder.--1961 Webcor Stereolite, model number EP 2208-1, serial number NXQX 6496. The volume and bass controls were set at a point approximately halfway between off and full capacity (number 5) for the recording and playback sessions. The treble was off during the recording session (as per the manufacturer's recording

directions) and set at the half on position (number 5) for the playback session.

Magnetic Tape.--Scotch brand all purpose magnetic tape, 1.5 mil. acetate, splice free, 1/4-111-12.

Materials

Stimulus Material Employed in Recording Session

Two types of stimulus material were utilized in the recording session. One consisted of a sampling of most of the consonants and vowels in the English language through the use of twenty-four key words which were represented by pictures. The words are listed below:

1.	apple	9.	flashlight	17.	squirrel
2.	bicycle	10.	mittens	18.	swing
3.	baby buggy	11.	onion	19.	toothpaste
4.	stove	12.	shoes	20.	telephone
5.	drum	13.	sheep	21.	christmas tree
6.	dozen of eggs	14.	thumb	22.	valentine
7.	George Washington	15.	soldier	23.	witch
8.	giraffe	16.	chair	24.	zebra

The second type of stimulus consisted of three questions which were as follows:

1. What did you do yesterday after school?
2. Describe your clothing.
3. What do you plan to do tomorrow after school?

Materials Employed in Rating Sessions

Master Tape Recording.--The master tape recording utilized in the rating sessions consisted of two minute speaker

presentation for the first five children (which served as a means of acclimating the listeners to the procedure and total situation) after which the presentations were edited to one minute followed by a 15 second interval designed for the marking of the rating sheet.

Rating Sheet.--A rating sheet was designed specifically for use in the rating sessions. The sheet consisted of two pages, with the first containing the words Teacher, Parent, and Speech Therapist underneath which were the directions "circle one," in parentheses. The rest of the page was devoted to the numbers one through eighteen followed by a straight line which ran across the page (continuum). Above the line at the left end was the word "slight," at the far right, the word "severe." Below is a sample of this:

1. slight _____ severe

The second page of the rating sheet consisted of the numbers nineteen through thirty-six with the corresponding lines and words. (Please refer to Appendix B for a copy of the rating sheet.) The numbers one through thirty-six corresponded to the thirty-six voices on the master tape recording.

Procedures

Procedure For Recording Speaker Subjects.--The recording sessions were held, in most cases, after school to enable

the researcher to achieve a certain amount of control over the background noise. The name of each picture was reviewed by the total group of children. After all pictures' names were known and questions understood, a trial taping session took place in which each child, individually put the words into sentences and answered any or all of the questions he so desired. Each child's presentation was prefaced with the carrier phrase, "Speaker number_____," the microphone was put into position (approximately six inches from the mouth), and the entire procedure was conducted similar to that of the actual taping with the exception that the recorder was turned off.

The researcher deemed it necessary to have training to this extent in the taping sessions to insure a continuous, verbal response from each child with the least amount of anxiety possible. The master tape recording was made only after all the children understood the complete list of words, were aware of what was expected of them, and exhibited little or no tension.

It was felt that the combination of the use of controlling key words with the samples of general conversation was a fair sample of each individual's general speech patterns and a good indication of the total articulatory disorder. However, due to the length of each presentation and the possibility of the occurence

of fatigue in the rating sessions, the researcher deemed it necessary to edit the tape to one minute individual presentations. In many cases the editing necessitated the elimination of the general conversation portion of the presentation. This was done upon the assumption that the key words served as a more constant source for evaluation and, in view of the results reported by Morrison,[1] that an evaluation based upon a fifteen second segment presentation was as reliable as one based upon a longer presentation of the speech stimulus.

Procedure for Playing of Recording to Raters.--The rating sessions for the parents and teachers were conducted in small groups of from four to seven individuals in private homes and school classrooms. In all cases, noise and background sounds were kept to a minimum. The position of the recorder speakers was between six to ten feet from the listeners.

The therapists' session was conducted in one large group in a classroom in which both noise and background sounds were limited as much as possible. The position of the recorder speakers was approximately ten feet from the listeners due to the classroom situation.

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[1]Sheila Morrison, "Measuring the Severity of Articulation Defectiveness," Journal of Speech and Hearing Disorders, XX (December, 1955), 350.

At the beginning of the rating sessions written directions (thus maintaining consistent behavior) were read. The directions consisted of an explanation of the purpose of the study and what to expect on the tape recording. The raters were instructed to mark their rating sheets by placing an X on the portion of the line which best indicated their evaluation of that child's speech disorder. The raters were informed that ten to fifteen minute breaks would occur after speakers number twelve and twenty-four. (Please refer to Appendix A for the complete text of the directions.)

Great care was taken in the reading of the directions and during the entire rating sessions to not give any type of frame of reference or clues which could be used by the raters as a basis for evaluation.

CHAPTER IV

RESULTS AND DISCUSSION

Results

The raw scores obtained from the rating sheets were subjected to several statistical tests. The objective was to find the differences between the three groups of raters and the deviation within groups.

Mean Scores

The mean of the mean ratings was determined for each rating group. This was accomplished by the addition of the rating means per child and dividing by the number of speaker subjects in the original recording tape used in the study (36 children). The results are presented in Table 1.

TABLE 1

MEAN SCORES FOR EACH GROUP OF RATERS

Group	Number	Mean Scores
Parents	12	4.38
Teachers	12	4.47
Therapists	12	3.51

Standard Deviations From the Mean of Each Rating Group

The standard deviation for each listening group was determined by use of the formula.

$$s=\sqrt{\frac{\Sigma x^2 - \frac{(\Sigma x)^2}{n-1}}{n-1}}$$

The results of this analysis are presented in Table 2.

TABLE 2

STANDARD DEVIATION FOR EACH RATING GROUP

Group	Number	Mean	Standard Deviation
Parents	12	4.38	1.56
Teachers	12	4.47	1.59
Therapists	12	3.51	1.26

Frequency Distribution of the Percent of Mean Scores According to Rating Group

The percentage of occurence of each unit of rating was determined for each rating group. The mean number of times each unit of rating (example: 1 - 1.9) was stated was tallied and converted into a percentage by means of multiplying the tallied number by 100 and dividing by the number of children (36). A bar graph was used in the presentation of the results of this work as the writer felt it to be the most meaningful manner in which to reveal a composite of the range of distribution.

The percentages for the parent group are shown in Figure 1, Figure 2 for the teachers, and Figure 3 for the therapist group.

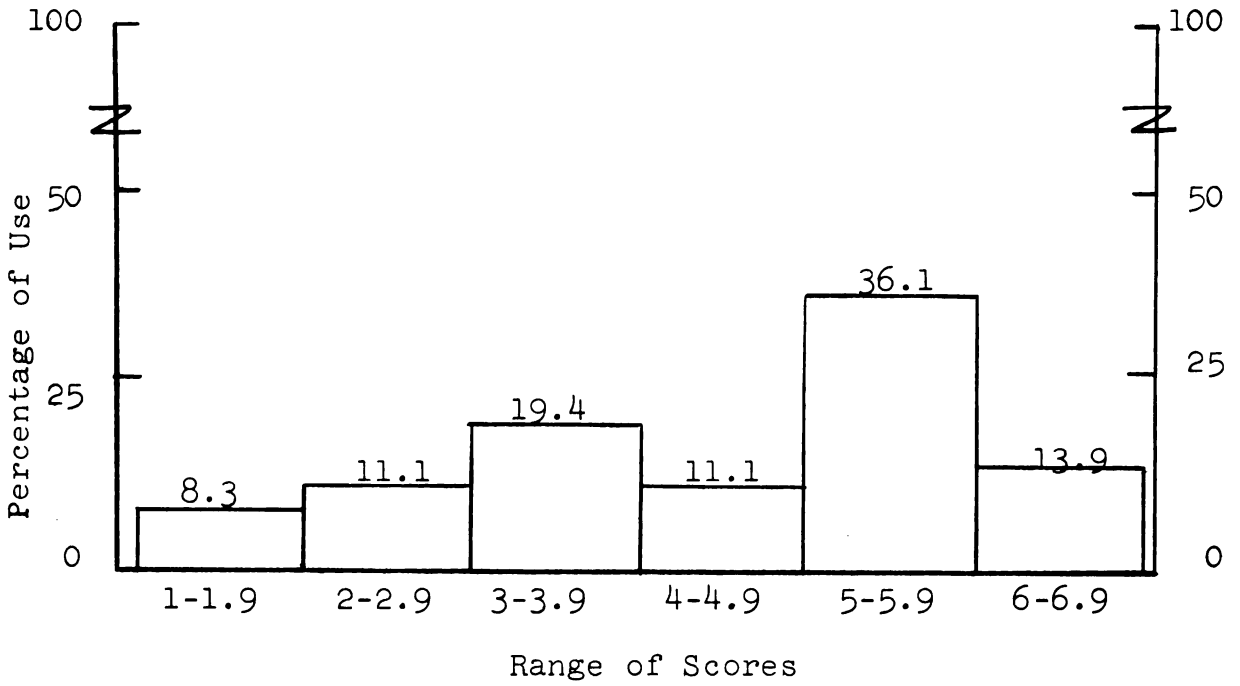

FIGURE 1.--PERCENTAGE OF PERCENT RESPONSES WITHIN THE RATING SCALE

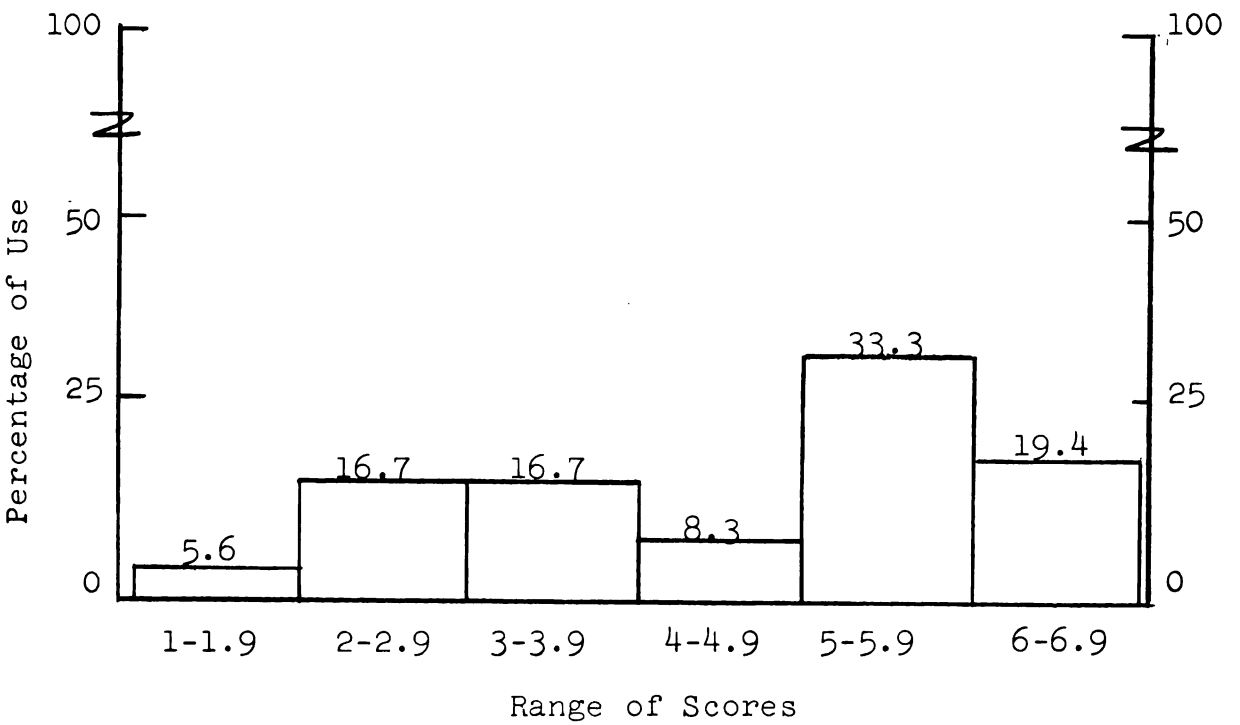

FIGURE 2.--PERCENTAGE OF TEACHER SCORES WITHIN THE RATING SCALE

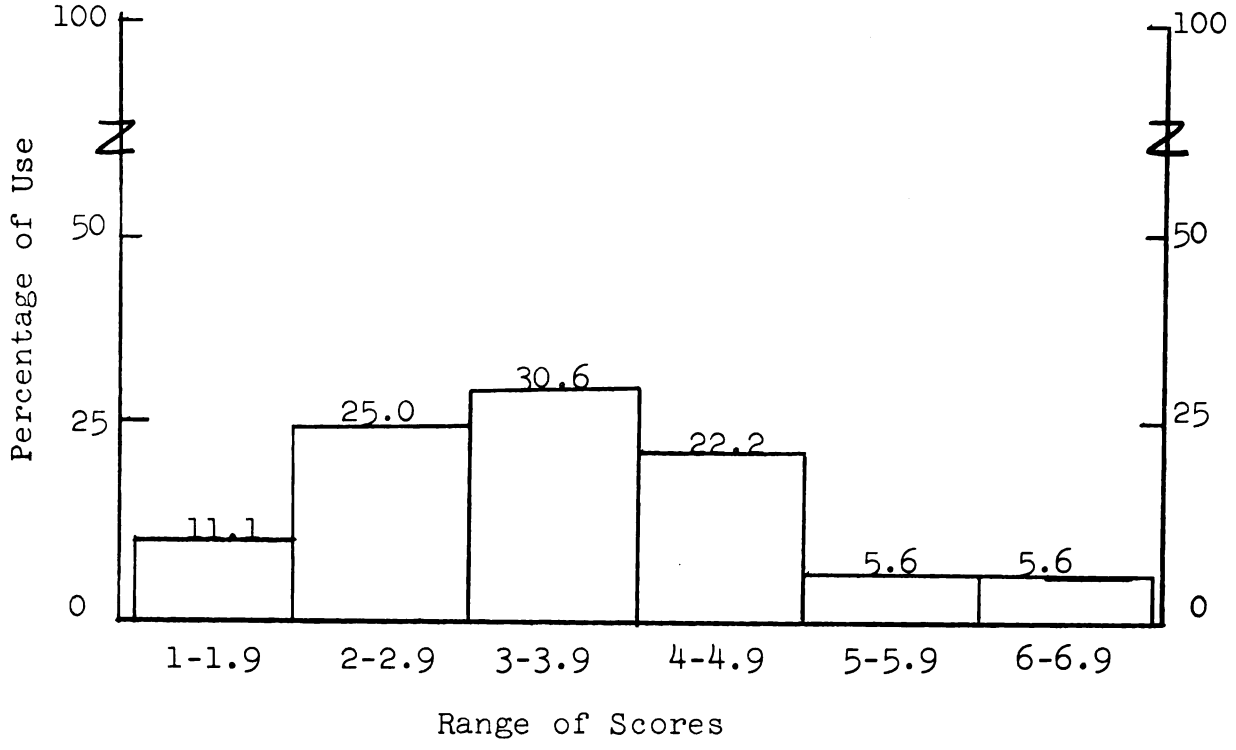

FIGURE 3.--PERCENTAGE OF THERAPIST RESPONSES WITHIN THE RATING SCALE

Frequency Distribution of Mean Scores According to Unit of Rating

Tne percentages introduced in Figures 1, 2, and 3, have been reorganized according to the unit of rating. Frequency distributions of the percentages for each rating group are presented in Figures 4, 5, 6, 7, 8, and 9.

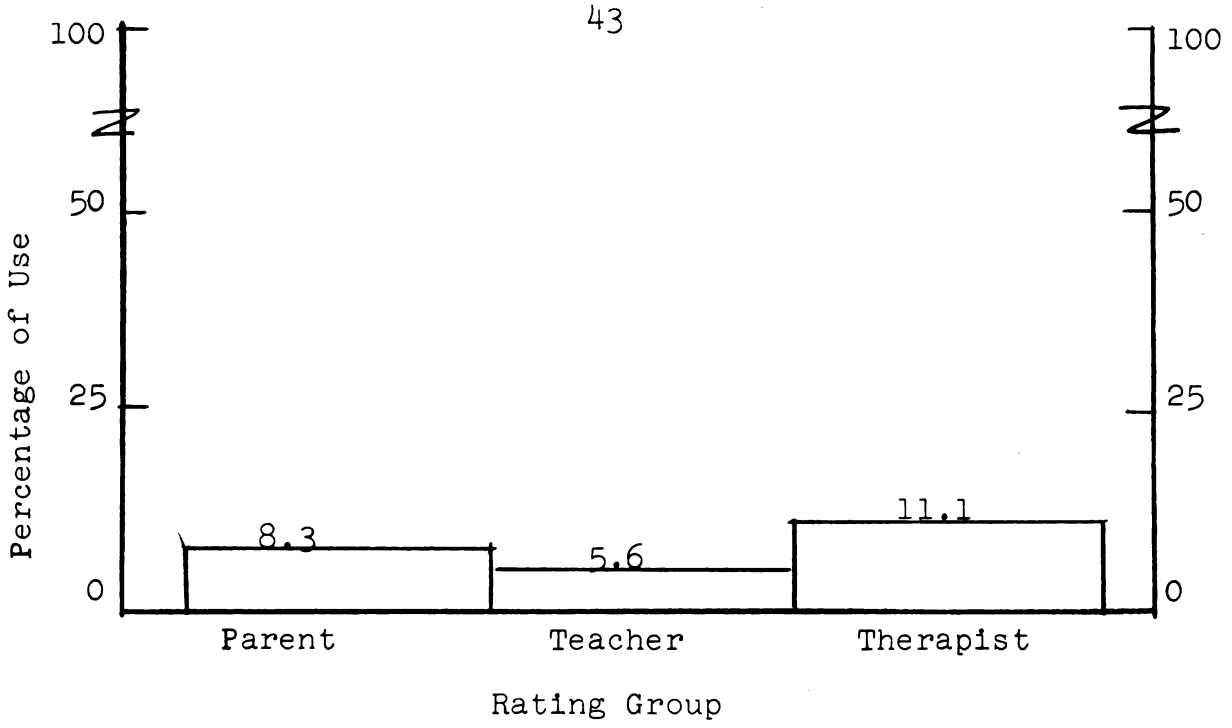

FIGURE 4.--FREQUENCY OF USE OF RATING 1-1.9 EXPRESSED IN PERCENTAGE

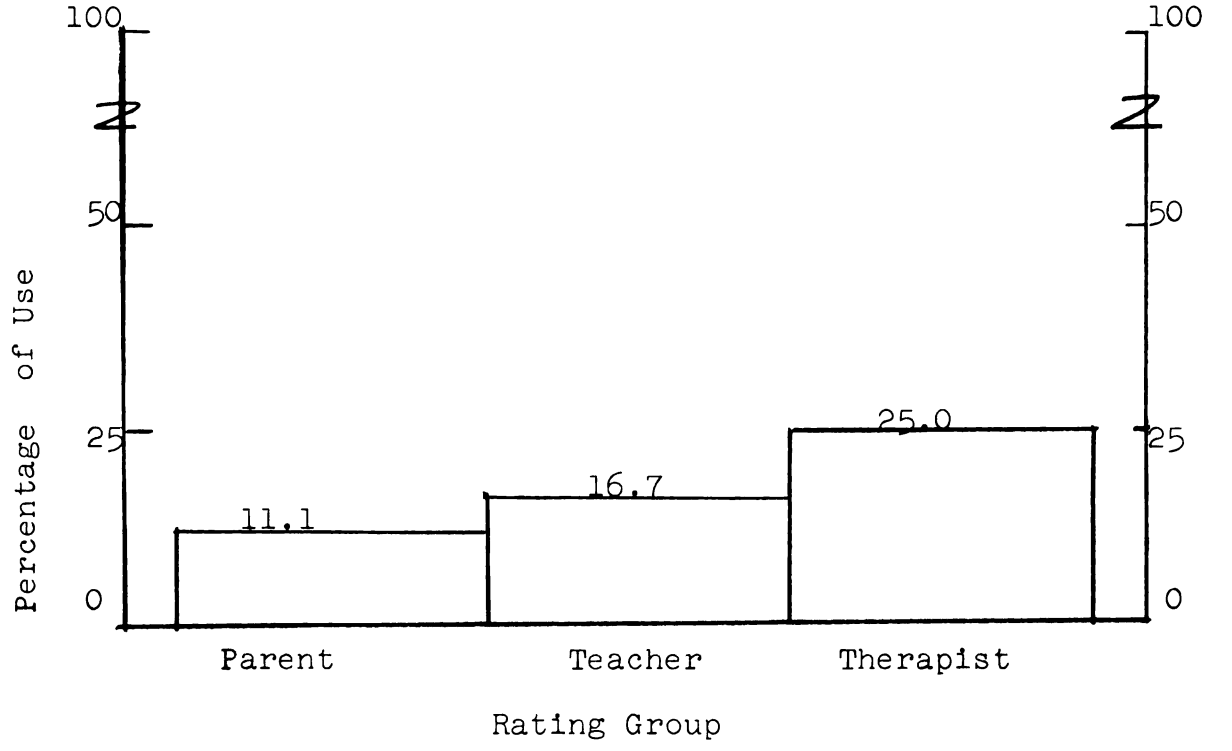

FIGURE 5.--FREQUENCY OF USE OF RATING 2-2.9 EXPRESSED IN PERCENTAGE

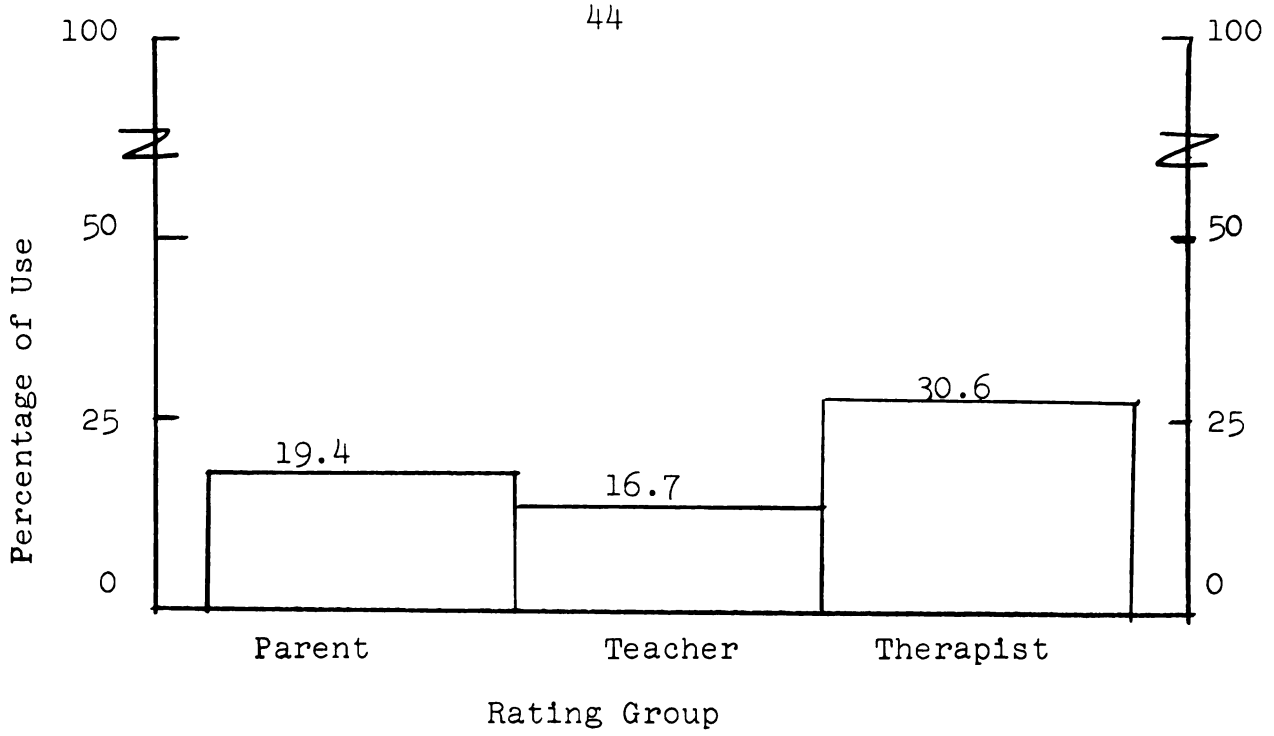

FIGURE 6.--FREQUENCY OF USE OF RATING 3-3.9 EXPRESSED IN PERCENTAGE

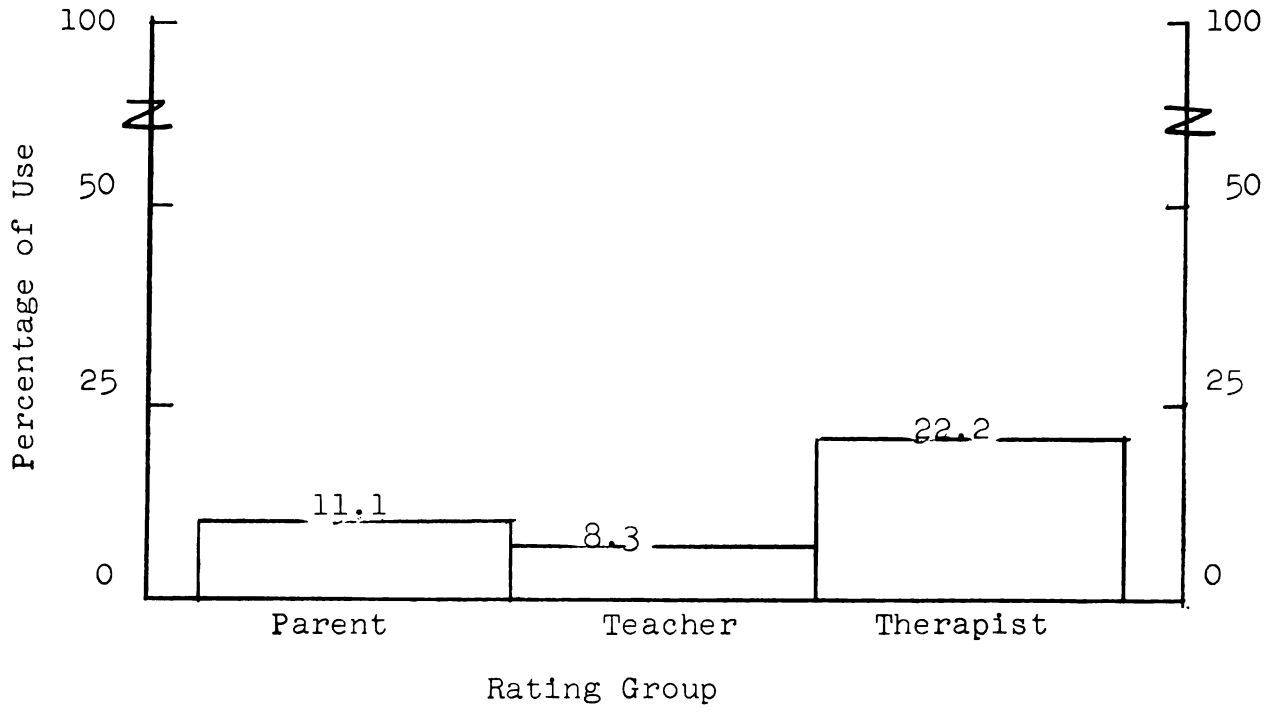

FIGURE 7.--FREQUENCY OF USE OF RATING 4-4.9 EXPRESSED IN PERCENTAGE

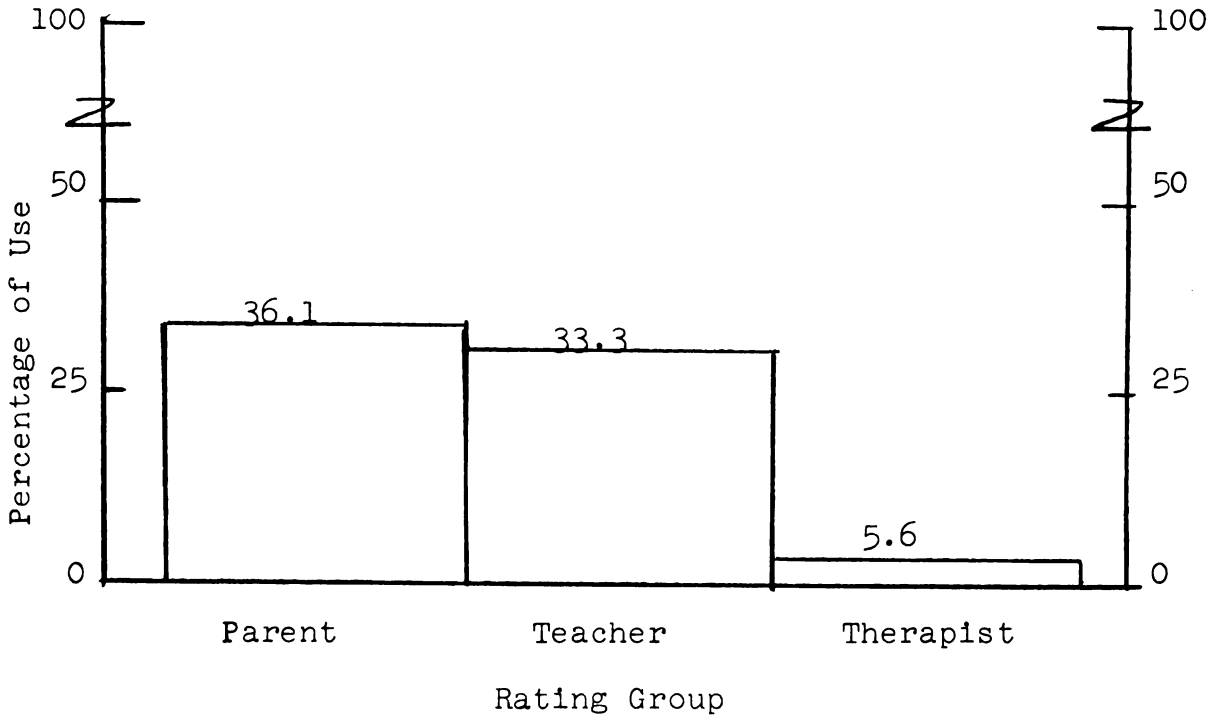

FIGURE 8.--FREQUENCY OF USE OF RATING 5-5.9 EXPRESSED IN PERCENTAGE

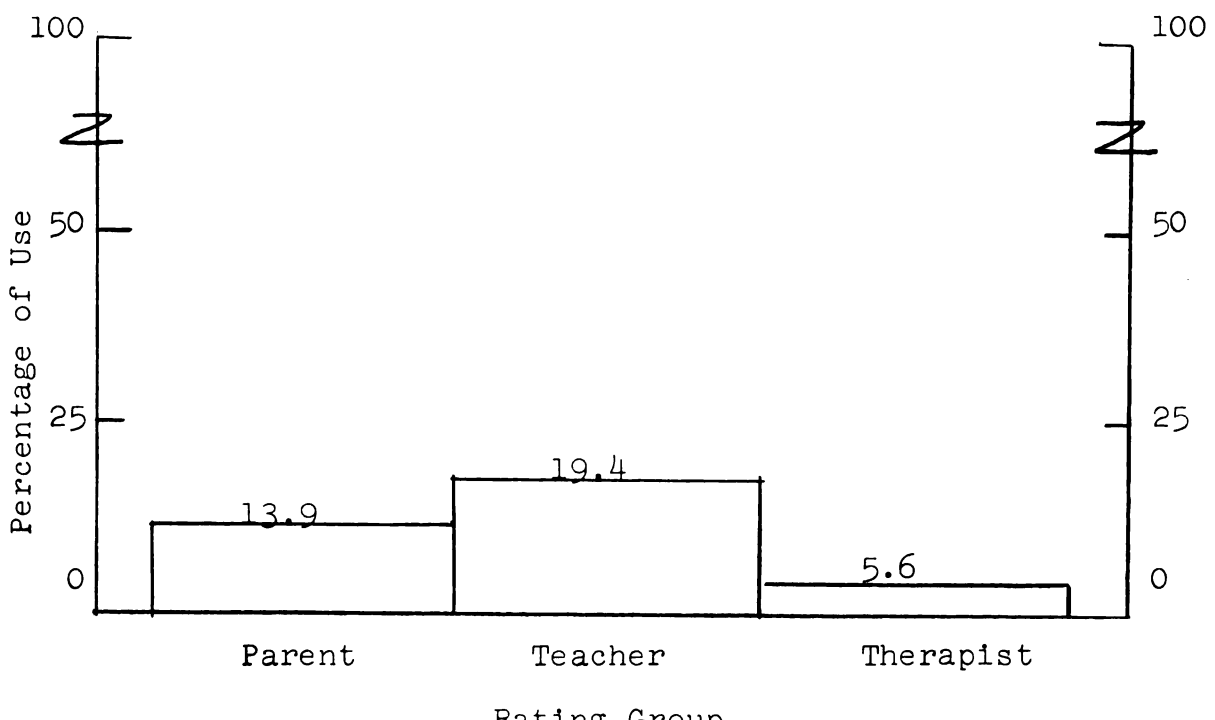

FIGURE 9.--FREQUENCY OF USE OF RATING 6-6.9 EXPRESSED IN PERCENTAGE

Comparison of Group Data

The differences in the rating of the children between groups were determined by use of the *t* test. The following formula was applied.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\bar{x}_1^2 + \bar{x}_2^2}}$$

The results of this means of analysis are presented in Table 3.

TABLE 3

RESULTS OF *t* TESTS

Group	Mean	df	*t*	Level of Confidence
Parent Teacher	4.4 4.5	70	.266	not significant at .05
Teacher Therapist	4.5 3.5	70	2.92	significant at .01
Therapist Parent	3.5 4.4	70	2.66	significant at .01

Discussion

The determination of the mean score for each rating group indicated the teacher and parent groups generally rated the speech as being more severely defective than did the therapist group. This could be interpreted as revealing more concern on the part of parents and teachers, but it is also possible these two groups felt somewhat

inadequate in this task and were inclined to overrate as a means of compensation for their inadequacy.

The fact that therapists rated less severely may indicate less concern on the part of this group for articulatory disorders. This may be due to the fact that the therapist views articulatory disorders of the type shown by the speaker subjects as being far less severe than some with which she is familiar. In other words the frame of reference for judgments for the therapists differ substantially from that of parents and teachers.

The standard deviation does not differ greatly among the three groups of raters. The therapist group, with the lowest standard deviation, indicated a slightly narrower range of scores and more consistent rating within the group itself, than either of the other two rating groups.

The teacher group had the highest standard deviation which indicates a wider range of scores and less similarity of rating within the members of the group.

The frequency distribution of the percent of mean scores according to rating groups revealed several interesting tendencies. The teacher and parent scores had a similar pattern in that they encompassed the total range and peaked at units two, three, and five thus indicating a diversity of opinion in the rating of articulatory disorders. The therapist group differed in

that the scores were grouped mainly about the two and four rating units which indicated a more consistent evaluation of articulatory difficulties.

It was also interesting to note that all groups used two units of ratings the same number of times. The parent groups used 2-2.9 and 4-4.9 units of rating; the teachers, units 2-2.9 and 3-3.9; and the speech therapists 5-5.9 and 6-6.9 the same number of times.

The frequency distribution of the mean scores according to unit of rating indicated in most cases parents and teachers are similar in their evaluation of articulatory disorders. It is interesting to note in this comparison, the speech therapist group reported a greater percentage of use for the first four units of rating (1-1.9, 2-2.9, 3-3.9, 4-4.9) than either the parent or teacher group. Beyond this point of rating the parent group reported the highest percentage of usage for the unit of rating 5-5.9 and the teacher group reported the highest use percentage for the rating unit of 6-6.9.

The comparison of group data resulted in several interesting facts. The results of the t test comparing the scores of the parent and teacher groups was not significant at the five percent level of confidence. Thus, it is impossible to reject the null hypothesis which states "There is no significant difference between parents' and classroom teachers' ratings in their evaluation of an elementary child's articulatory disorder."

The teacher and therapist groups, when analyzed by the *t* test, resulted in a score of 2.92 significant at the one percent level of confidence which led to a rejection of the null hypothesis "There is no significant difference between teachers' and therapists' ratings of elementary childrens articulatory disorders."

The *t* score resulting from a comparison of the therapists and parents groups was found to be 2.66 was significant at the one percent level of confidence thus requiring a rejection of the null hypothesis which states, "Parents and therapists do not differ significantly in the rating of children's articulatory disorder."

CHAPTER V

SUMMARY AND CONCLUSION

Summary

A good public school speech therapy program requires an efficient and trustworthy method of locating children having speech disorders. The final selection of the children to be enrolled in a speech program is left to the discretion of the speech therapist but the manner in which the children are located is of interest to all.

The purpose of this study has been to investigate the reliability of parent and teacher referrals as a means of locating children with defective speech. The extent of agreement in speech ratings between classroom teachers, parents, and speech therapists served as the means of evaluation of parent and teacher referrals to the speech therapist in the public school situation.

A review of the literature regarding parent, teacher, and therapist ratings of speech revealed a controversy regarding the merits of both the teacher and parental referrals approaches.

The raters for this study consisted of twelve elementary classroom teachers, twelve parents of children under nine years of age, and twelve public school speech

therapists. The raters listened to the recorded speech samples of thirty-six children having defective articulation. The examiner conducted small group rating sessions for the parents and teachers, and a single large group session for the speech therapists.

The findings of this study indicate the teachers rated the speech samples higher in severity than either the groups of parents or speech therapists. This was apparent in a comparison of the mean scores of each group. The ratings of the parent group seemed to be more similar to those of the teachers than the speech therapists. The lowest scores in the rating of speech severity were by the group of speech therapists.

The standard deviation does not differ greatly among the three groups; however, there was a tendency for the teacher ratings to have the widest range of scores. The lowest standard deviation was that of the group of speech therapists which indicated a tendency for more consistent answers, thus, a somewhat more narrow range of scores.

The frequency distrubution of the percent of mean scores according to rating group indicated a wide range of scoring for both the teacher and parent groups which localized at the medium severity point and extended to the severe point of the range, whereas, the scores of the therapists were grouped about the low to medium severity points on the total range of scores.

The frequency distribution of mean scores, according to unit of rating, indicated a general tendency for the parent and teacher groups to be in closer agreement on the rating of defective speech than with the group of speech therapists.

Conclusions

Within the framework of this investigation the following conclusions can be made:

1. Classroom teachers rate articulatory disorders in children as being more severe than do parents or public school speech therapists.
2. Public school speech therapists rate articulatory disorders in children as being less severe than do parents or classroom teachers.
3. The ratings of articulatory disorders by parents are less different from those of the classroom teacher than are those of the public school speech therapist.
4. Both parents and teachers tend to be less consistent in the rating of articulatory disorders than public school speech therapists.
5. There is a possibility that parents and teachers are capable of locating children having defective speech of an articulatory nature. Parents and teachers tend to overrate the severity of the articulatory disorder.

Implications for Future Research

The following questions that have emerged as a result of the present study might well serve as a basis for future research:

1. To what extent are parents and teachers able to recognize, identify, and describe articulatory disorders?
2. Are there certain articulatory disorders more easily identified than others by parents and classroom teachers?
3. Does the amount of teaching experience have any influence on the teachers rating and identification of defective speech?
4. What constitutes the criteria used by parents and teachers when evaluating defective speech?
5. Do the criteria used by parents and teachers in the evaluation of speech correlate with those employed by public school speech therapists?

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APPENDICES

APPENDIX A

DIRECTIONS FOR LISTENING SESSION

The purpose of this study is to determine the amount of agreement between teachers, parents, and speech therapists when judging the severity of a child's speech difficulty.

The tape recording you are about to hear consists of 36 voices of elementary children who have speech problems ranging from slight to severe. Each child was asked to put 24 key words into sentences. He was also asked to describe his clothing and to relate what he had done at home the night before the taping session.

Each child is introduced by the carrier phrase "speaker number _____" (1, 2, et cetera) and talks for two minutes. A short interval of silence will follow each child's presentation during which time you will mark the severity of the child's speech problem on your rating sheet.

Please look at your rating sheet. Please circle parent, teacher, or therapist. If you are both a teacher and a parent, circle both and put the grade in which you teach below teacher. You will see it contains a number followed by a straight line. The number refers to the child's number on the tape. The word "slight" appears above the line closest to the child's number and the word "severe" is above the line at the far end of the line. If you feel

the child has a very slight speech problem you would place an X on the line near the word "slight." If you judged the child as having a very severe problem you would place an X on the line close to the word "severe." If you feel the child has a medium amount of speech difficulty you would place an X somewhere in the approximate middle of the line. You may feel a child has a fairly severe speech problem but it is not as severe a problem as that of another child. In this case you would place the X somewhere between the middle and far end of the line depending upon your feeling of the extent of the severity. This procedure would likewise apply to a speech problem you judged to be between the "slight" and "medium" areas.

May I suggest when deciding the extent of the speech problem for each child please base your decision upon the total presentation. Try not to be influenced by a few words or merely the extent to which you recognized the key words in the sentences.

We will take a short break after speakers number 12 and 24.

Now let us begin our listening to the tape.

APPENDIX B

RATING SHEET

No. _____

Teacher, Parent, Speech Therapist
(circle one)

1. slight_____severe
2. slight_____severe
3. slight_____severe
4. slight_____severe
5. slight_____severe
6. slight_____severe
7. slight_____severe
8. slight_____severe
9. slight_____severe
10. slight_____severe
11. slight_____severe
12. slight_____severe
13. slight_____severe
14. slight_____severe
15. slight_____severe
16. slight_____severe
17. slight_____severe
18. slight_____severe
19. slight_____severe
20. slight_____severe
21. slight_____severe

22. slight_____severe

23. slight_____severe

24. slight_____severe

25. slight_____severe

26. slight_____severe

27. slight_____severe

28. slight_____severe

29. slight_____severe

30. slight_____severe

31. slight_____severe

32. slight_____severe

33. slight_____severe

34. slight_____severe

35. slight_____severe

36. slight_____severe

This is not a proportionate reproduction of the rating sheet which was employed in the original study as the binding process necessitated the shortening of the continuum from seven inches to one of a shorter length.

APPENDIX C

RAW SCORES OF PARENT GROUP

Speaker Number	Parent Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1	5.9	4.8	5.2	4.6	2.9	3.5	5.6	5.2	3.8	6.4	6.5	6.2
2	1.5	2.2	1.6	2.1	2.2	1.4	1.6	3.2	1.7	2.7	1.4	1.3
3	5.8	3.6	6.3	3.2	2.5	5.0	6.4	6.2	2.3	4.9	5.5	5.9
4	6.5	4.2	5.5	4.9	4.4	6.4	5.7	6.6	2.0	5.4	5.2	4.9
5	3.7	3.5	5.6	2.2	3.0	5.1	3.8	6.7	2.1	2.2	3.5	2.6
6	1.4	1.3	1.3	1.4	1.5	1.4	1.4	1.4	1.4	3.5	1.4	1.3
7	2.2	2.2	1.3	1.4	1.8	1.4	1.4	1.4	1.5	3.3	2.0	1.6
8	4.9	4.8	2.3	2.1	1.7	3.6	5.2	3.4	1.6	2.3	3.6	2.6
9	1.8	2.8	4.9	1.5	3.0	3.8	1.9	4.0	1.6	2.2	5.7	2.2
10	1.6	1.6	1.4	1.6	4.0	1.4	1.5	1.5	1.5	1.7	2.9	2.9
11	5.7	5.9	5.8	5.6	4.8	3.6	6.3	6.2	3.8	6.4	4.6	5.8
12	5.0	3.9	4.8	5.4	3.7	2.4	5.1	2.7	2.4	6.1	3.5	5.4
13	6.6	6.3	6.5	6.0	4.2	6.4	6.3	6.6	2.5	6.4	6.4	6.3
14	6.2	5.7	5.6	5.7	4.9	6.3	6.2	5.5	2.3	6.0	4.3	5.9
15	4.2	2.3	2.2	3.2	3.6	1.4	2.5	2.6	1.7	5.9	3.9	4.0
16	6.3	3.9	6.5	6.4	4.8	6.4	6.2	6.1	3.8	5.1	5.9	5.9
17	1.6	1.6	1.6	2.2	2.7	1.5	1.7	3.8	1.6	2.9	2.0	2.0
18	2.0	2.1	2.5	2.5	3.8	1.4	1.7	2.4	2.4	1.6	4.2	3.8
19	2.6	1.7	1.4	1.9	4.6	1.4	1.5	3.9	1.6	1.9	2.4	1.7
20	6.5	6.5	6.6	6.6	5.4	6.6	6.5	6.6	6.3	6.6	6.6	6.6
21	3.7	5.0	1.4	2.3	5.6	1.5	2.4	5.5	2.2	3.4	3.2	4.0
22	5.9	6.3	6.6	5.5	6.1	6.5	6.5	6.7	5.9	6.6	5.7	6.6
23	3.9	3.5	1.4	2.1	4.8	2.4	3.7	5.0	1.8	2.0	4.0	2.0
24	5.8	6.1	6.5	5.6	5.6	5.5	5.5	3.5	4.4	6.4	5.2	4.5
25	6.7	5.4	6.5	6.0	5.9	6.5	6.4	4.3	4.2	6.7	4.8	5.7
26	3.8	3.2	4.9	2.1	3.0	3.8	2.2	3.2	3.6	2.5	2.2	3.8
27	6.6	6.0	6.4	6.4	5.8	5.5	6.4	4.7	4.2	5.3	5.8	6.0
28	6.7	6.4	6.4	6.4	4.6	6.5	6.4	2.5	6.1	6.6	6.3	6.7
29	5.8	4.9	5.3	2.4	5.4	5.2	5.7	5.7	4.1	5.3	5.6	4.1
30	6.6	5.7	6.6	6.7	5.9	6.5	6.4	6.5	5.7	6.6	6.2	6.4
31	6.6	4.3	6.4	6.7	4.8	4.2	4.1	5.7	4.2	6.3	5.7	5.7
32	4.7	3.8	5.7	3.3	5.2	5.1	5.4	6.2	4.1	1.6	4.5	3.6
33	6.6	6.7	6.5	7.0	6.1	6.5	6.4	6.5	4.7	6.6	6.6	6.6
34	6.5	5.5	5.7	6.1	5.6	6.5	6.4	6.3	4.9	6.4	5.2	5.0
35	5.9	5.5	5.8	6.3	4.8	4.1	5.5	5.8	3.6	6.7	5.4	5.0
36	6.5	4.8	5.6	6.6	5.9	4.0	5.6	3.7	5.7	6.6	5.7	6.1

RAW SCORES OF TEACHER GROUP

Speaker Number	Teacher Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1	6.1	3.8	6.5	2.0	5.8	6.6	6.5	6.2	4.8	5.7	6.8	5.7
2	1.9	1.4	1.9	1.5	1.7	2.0	1.9	2.1	2.9	1.9	2.7	1.6
3	5.9	4.7	6.6	4.6	5.7	6.4	3.8	6.4	5.4	6.5	6.2	6.3
4	5.8	4.8	6.5	5.6	5.5	6.2	3.7	6.6	5.3	6.3	6.4	6.4
5	5.7	2.0	5.7	4.7	4.6	2.0	3.7	3.7	3.8	3.5	3.1	2.8
6	2.0	1.4	1.5	1.0	1.5	1.4	1.6	1.6	2.1	1.5	1.2	1.6
7	2.0	2.1	2.6	1.7	1.6	1.8	2.2	1.3	3.7	2.3	1.3	2.4
8	3.6	2.2	3.8	4.8	2.1	5.0	4.1	2.0	4.3	4.5	2.3	2.7
9	3.6	2.7	2.2	3.9	2.3	1.8	4.9	1.7	2.8	2.3	3.4	2.0
10	1.9	6.7	2.1	1.0	2.2	1.4	1.6	1.5	2.1	2.2	4.2	1.7
11	6.0	4.8	4.8	6.6	5.1	2.6	5.9	5.5	2.6	5.8	4.6	5.7
12	4.8	6.7	2.7	5.8	4.3	1.9	6.0	5.0	3.7	4.0	3.3	5.1
13	6.0	6.7	6.5	6.6	6.1	6.5	6.5	5.6	3.8	6.3	5.2	6.6
14	5.9	3.4	5.9	6.5	4.5	6.4	6.5	6.6	6.1	6.3	6.7	6.1
15	2.9	4.8	5.8	1.8	2.2	1.5	3.9	2.8	4.6	2.1	1.6	2.4
16	6.0	3.8	6.6	6.5	6.2	5.7	6.6	6.6	5.8	5.9	7.0	6.4
17	2.0	1.6	1.5	1.0	1.6	1.4	1.6	1.9	3.1	1.6	2.0	2.1
18	1.6	2.3	2.1	3.6	2.6	2.0	3.3	1.5	3.5	2.0	2.6	1.7
19	2.3	2.3	2.4	2.7	1.7	3.3	3.4	1.4	3.2	4.3	1.4	1.7
20	6.7	4.4	6.7	6.5	6.7	6.7	6.6	6.7	6.5	6.6	7.0	6.6
21	5.5	2.5	3.8	4.4	1.9	1.7	2.4	3.7	3.7	2.2	3.3	2.1
22	6.5	3.3	6.7	6.5	6.1	6.5	6.5	6.5	5.9	6.0	6.9	6.2
23	3.3	2.6	6.0	4.1	3.2	2.6	1.8	2.3	4.0	2.3	2.3	2.1
24	5.4	4.3	6.0	5.7	4.1	5.5	5.0	5.8	5.0	5.8	5.2	5.5
25	6.2	3.6	6.6	5.1	4.9	6.5	6.4	6.2	5.7	5.8	6.9	5.9
26	4.3	1.6	3.7	4.1	4.6	1.7	3.4	1.6	5.3	3.5	2.9	2.3
27	6.2	6.5	6.1	6.7	5.3	5.4	6.4	6.3	6.3	6.5	6.7	6.5
28	6.5	5.7	6.6	6.6	5.6	6.6	6.4	6.6	5.7	6.4	7.0	6.4
29	2.5	6.0	6.0	5.6	4.8	4.4	5.4	2.9	5.2	2.7	3.5	3.4
30	6.4	5.2	6.0	6.6	6.6	5.7	5.9	6.2	6.6	5.3	5.9	4.3
31	5.9	6.6	6.0	6.5	4.3	4.4	4.1	5.5	6.0	5.0	4.9	2.9
32	5.2	3.3	5.3	2.5	3.8	3.3	5.4	4.6	5.4	4.1	5.3	3.4
33	6.5	6.6	6.6	6.8	6.6	6.6	6.6	6.6	6.5	6.5	7.0	6.5
34	5.0	5.0	6.1	6.6	4.3	6.6	6.1	4.4	5.5	5.8	4.9	5.0
35	6.0	5.5	6.1	6.5	5.3	6.6	6.1	5.8	6.0	5.7	4.9	3.6
36	5.6	6.6	6.6	5.3	5.8	6.6	6.0	5.4	6.6	5.0	5.9	4.3

RAW SCORES OF THERAPIST GROUP

Speaker Number	Therapist Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1	5.5	4.9	2.9	6.0	3.9	1.4	2.4	4.9	4.0	6.3	4.8	5.9
2	1.4	1.5	1.4	3.8	2.0	2.9	1.6	2.4	1.6	2.9	3.9	1.4
3	5.3	2.3	6.1	4.6	1.4	2.7	3.3	5.8	1.8	5.8	4.0	4.2
4	1.8	3.0	6.1	4.5	2.0	1.9	4.1	5.9	2.4	4.7	5.0	4.5
5	1.8	1.8	1.9	3.6	2.5	1.7	4.4	4.8	2.1	2.7	1.8	3.9
6	3.6	1.1	1.5	1.6	1.0	1.4	1.5	1.7	1.4	1.6	2.2	1.9
7	1.6	1.8	1.6	1.6	1.0	1.3	1.5	2.0	1.5	1.6	1.9	1.9
8	3.0	2.6	1.9	2.3	5.3	1.5	2.3	2.4	2.3	2.2	2.5	1.7
9	2.6	2.8	2.5	3.1	3.6	1.9	2.5	5.1	1.6	3.4	2.0	1.3
10	4.2	1.4	1.3	2.8	1.7	1.2	1.7	1.8	1.4	1.3	1.3	1.1
11	2.9	3.4	3.9	2.9	6.4	3.5	4.0	6.1	1.5	3.3	3.9	4.2
12	3.6	3.1	1.8	2.7	3.9	3.0	3.7	5.3	2.8	2.3	2.8	3.3
13	5.7	5.9	2.1	4.2	4.3	3.5	5.3	5.2	3.0	3.3	3.8	4.2
14	5.7	3.3	6.3	4.1	6.6	3.2	5.6	5.7	2.1	2.6	4.1	4.2
15	2.7	2.5	2.4	4.3	3.0	2.8	2.7	5.2	2.1	1.5	1.6	3.8
16	3.3	2.7	4.3	4.0	4.2	3.6	4.1	5.7	4.6	3.4	4.9	4.4
17	1.5	1.3	1.5	3.3	1.4	1.8	2.2	3.0	1.4	1.5	2.5	1.2
18	2.1	2.2	1.8	2.6	2.1	1.5	2.0	2.3	2.5	1.8	2.5	2.1
19	2.0	1.4	1.3	3.1	1.5	1.6	1.6	5.0	1.6	1.7	2.0	1.5
20	6.3	6.4	6.6	5.0	7.0	6.4	6.1	6.6	6.1	6.2	6.1	6.7
21	4.3	2.4	2.6	2.9	1.2	2.0	1.6	4.4	2.0	2.0	1.8	1.4
22	5.7	5.9	6.4	5.8	6.9	6.2	5.9	5.6	6.2	3.9	5.7	6.4
23	2.9	1.6	1.9	3.8	1.3	2.1	1.5	4.9	1.8	1.6	1.7	2.1
24	4.8	2.2	2.2	3.1	3.9	3.0	2.3	5.6	2.0	3.9	5.6	2.4
25	5.2	5.3	3.0	3.7	6.1	3.6	4.4	5.0	2.6	5.0	3.9	5.5
26	4.6	2.1	2.2	3.7	3.3	2.8	3.7	5.0	2.5	2.3	3.4	2.5
27	4.3	3.9	2.8	3.3	5.9	3.0	4.7	6.1	2.1	3.5	3.2	5.3
28	5.8	5.7	4.5	3.0	6.6	3.7	6.4	6.6	5.2	6.2	5.9	6.3
29	2.7	3.3	3.1	2.4	1.4	1.9	4.2	5.6	4.3	3.3	2.9	3.3
30	5.5	2.0	5.3	5.3	6.0	4.1	6.2	6.3	3.9	3.5	5.4	4.4
31	3.5	3.1	4.7	3.4	3.9	3.0	3.8	5.3	3.4	3.1	5.3	3.6
32	4.3	3.1	1.9	2.5	4.5	2.7	4.6	5.9	2.8	2.3	2.9	4.1
33	6.8	6.3	6.6	6.1	6.9	6.3	6.2	6.7	3.3	6.1	6.4	6.6
34	2.0	5.6	2.7	2.7	2.3	4.7	2.5	6.4	1.9	3.5	4.7	5.6
35	2.3	3.6	2.8	3.7	1.9	2.7	3.7	5.9	2.2	2.3	4.8	5.3
36	4.8	3.8	3.8	3.1	5.3	5.1	3.5	6.6	4.2	4.8	4.0	6.5

APPENDIX D

PARENT GROUP

Speaker Number	Mean	Median	Mode
1	4.8	5.2	5.2
2	1.9	1.7	2.2, 1.6, 1.4
3	4.8	5.25	---
4	5.1	5.4	4.9
5	3.7	3.6	3.5, 2.1
6	1.6	1.45	1.3
7	1.8	1.7	1.8, 1.6
8	3.1	3.0	3.6, 2.3
9	3.0	2.2	2.2
10	2.0	1.65	1.6, 1.5
11	5.4	5.7	5.8
12	4.2	4.35	5.4, 2.4
13	5.9	6.3	6.4, 6.3
14	5.4	5.65	6.2, 5.7
15	3.1	2.9	---
16	5.6	6.0	6.4, 5.9
17	2.1	2.1	1.6
18	2.5	2.25	2.5, 2.4
19	2.2	1.9	1.9, 1.7, 1.4
20	6.5	6.4	6.6
21	3.4	3.3	---
22	6.2	6.2	6.6
23	3.1	3.5	2.0
24	5.4	5.55	5.6, 5.5
25	5.8	5.8	6.7, 6.5
26	3.2	3.1	3.8
27	5.8	5.65	6.4
28	6.0	6.35	6.4
29	5.0	5.3	5.7, 5.3, 4.1
30	6.3	6.4	6.6
31	5.4	5.7	5.7
32	4.4	4.6	---
33	6.4	6.5	6.6
34	5.9	5.9	6.5, 6.4
35	5.4	5.45	5.8, 5.5
36	5.6	5.7	6.6, 5.7, 5.6

TEACHER GROUP

Speaker number	Mean	Median	Mode
1	5.5	5.95	6.5, 5.7
2	2.0	1.9	1.9
3	5.7	5.9	6.4
4	5.8	5.8	6.4
5	3.8	3.7	5.7, 3.7, 2.0
6	1.5	1.5	1.6, 1.5
7	2.1	2.1	1.3
8	3.5	3.7	---
9	2.8	2.7	2.3
10	2.4	1.8	2.2, 2.1
11	5.0	5.65	4.8, 2.6
12	4.4	4.55	---
13	6.0	6.1	6.5
14	5.9	6.3	6.5, 6.1, 5.9
15	3.0	2.6	---
16	6.1	6.1	6.6
17	1.8	1.75	1.6
18	2.4	2.2	2.6, 2.0
19	2.5	2.7	2.3, 1.7, 1.4
20	6.5	6.6	6.7
21	3.1	2.5	3.7
22	6.1	6.15	6.5
23	3.1	3.2	2.3
24	5.3	5.4	5.8, 5.5, 5.0
25	5.8	5.9	6.2
26	3.3	3.5	1.6
27	6.2	6.25	6.5
28	6.3	6.45	6.6
29	4.4	4.4	6.0
30	5.9	5.9	6.6
31	5.2	5.0	6.0
32	4.3	4.1	5.4, 5.3, 3.3
33	6.6	6.7	6.6
34	5.4	5.25	5.0
35	5.7	5.75	6.1, 6.0
36	5.8	5.6	6.6

THERAPIST GROUP

Speaker Number	Mean	Median	Mode
1	4.4	4.8	4.9
2	2.2	2.2	1.4
3	3.9	4.0	5.8
4	3.8	4.1	4.5
5	2.8	2.6	1.8
6	1.7	1.6	1.6, 1.5, 1.4
7	1.6	1.6	1.6
8	2.5	2.35	2.3
9	2.7	2.6	2.5
10	1.8	1.55	1.3
11	3.8	3.7	3.9, 2.9
12	3.2	3.0	2.8
13	4.2	4.2	4.2
14	4.5	4.15	5.7, 4.1
15	2.9	2.7	2.7
16	4.1	4.15	---
17	1.9	1.8	1.5
18	2.1	2.15	2.1
19	2.0	1.65	1.6
20	6.3	6.35	6.1
21	2.4	2.2	2.0
22	5.9	5.85	6.4, 6.2, 5.9, 5.7
23	2.3	1.85	2.1, 1.6
24	3.4	3.0	5.6, 3.9
25	4.4	4.4	5.0
26	3.2	3.05	3.7, 2.5
27	4.0	3.7	---
28	5.5	5.8	6.6
29	3.2	3.0	3.3
30	4.8	5.3	5.3
31	3.8	3.6	5.3, 3.4, 3.1
32	3.5	3.0	---
33	6.2	6.4	6.6, 6.3, 6.1
34	3.7	2.7	5.6, 4.7, 2.7
35	3.4	3.2	3.7, 2.3
36	4.6	4.5	4.8, 3.8