AN INVESTIGATION OF SPEECH MISARTICULATIONS OF GRADE SIX CHILDREN IN TWO CANADIAN SCHOOL SYSTEMS

by

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AN ABSTRACT OF A THESIS

An Investigation of Speech Misarticulations of Grade Six Children in Two Canadian School Systems

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The purpose of this study was to assess the relative effectiveness of a program of speech therapy in the elementary schools by determining the difference between two urban school populations, one having provided a program of speech therapy for ten years previously, and the other lacking such a program, in terms of:

- 1. pupil performance on a speech test
- 2. ability of teachers to identify misarticulations, and
- pupils' opinions of their speaking ability and their confidence in speaking situations.

Plan of the Study

Administrators in the field of special education should be provided with information on the effectiveness of speech therapy in the public school program.

Procedure

Review of the literature was made in terms of studies on speech problems, incidence of speech problems,

reports on programmes of speech therapy in public schools, and studies undertaken in Canada.

A pilot study was undertaken and the judgments of the investigator, who is a qualified speech therapist, and of one other qualified speech therapist were compared.

Two hundred and seventy-six Grade Six pupils in each of two Canadian school systems were screened by the investigator by means of an articulation test, and the results reported quantitatively.

Teachers were asked to identify all children with speech misarticulations, and to judge the effect such misarticulations had on the children socially and academically. Teachers' and therapist's identification of speech misarticulations were compared.

Pupils were asked to answer a questionnaire containing questions about their speaking ability and confidence in speaking situations. The investigator gave an arbitrary value to the responses to these questions, and surmised that the higher the total score, the more the pupil's concern about speaking ability.

<u>Results</u>

Results of the questionnaire and speech test were collated, summarized and correlated with IBM data-processing equipment. The results showed a statistically significant difference in the mean scores on the speech assessment of the two groups. The children in the school system providing speech therapy made higher scores.

More teachers identified children with articulation difficulties in the school system providing speech therapy. Their judgments compared favourably with the judgments of the investigator.

In the total group tested, it was found that children with one or more misarticulations scored significantly higher on the Pupil Questionnaire than did those children with no misarticulations. This same relationship existed between the mean score on the Pupil Questionnaire for the pupils having one or more misarticulations on the speech assessment, in the school system with therapy. This relationship, however, was not found to be present under the same criteria in the school system that did not provide therapy.

<u>Conclusions</u>

The investigator suggests that the differences in the two groups tested may be accounted for on the basis of a speech therapy programme or the basis of other factors which are as yet unidentified. It was recommended further that the same type of study be repeated in two school systems providing speech therapy, and in two school systems which do not provide speech therapy.

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CHAPTER I

ORIENTATION TO THE STUDY

ORIGIN OF THE PROBLEM

Teachers and administrators in the field of special education, through observations of various school systems, have suggested that Canadian school systems have not implemented programmes for exceptional children to a degree comparable with that of other nations. It is generally agreed that one of the areas in which there has been particularly slow development is that of remedial facilities for speech handicapped school children.

Studies of speech problems¹ indicate that although speech difficulties of school children usually decrease in the primary grades, not all speech difficulties are outgrown by the Grade Six level. Comparable reports of the effects of speech therapy programmes in the public schools are few. It has been suggested by some administrators and school

¹D. W. Morris, "A Survey of Speech Defects in Central High School, Kansas City, Missouri," <u>Quart. Jour.</u> <u>Speech</u>, 25:262-267, April, 1939; D. R. Evans, "Report of Speech Survey in the 9-A Grade," <u>Quart. Jour. Speech</u>, 21:83-90, February, 1938; William D. Coombs, "The Development of Articulated Speech Sounds in the Elementary School" (Saskatoon: The University of Saskatchewan, 1963). (Mimeographed.)

boards that most children grow out of their problems, and therefore speech therapy is not essential to the basic school programme.

Most research investigations have been carried out in the United States and in England, while only a few studies have been reported by Canadian researchers.²

For the guidance of school administrators, and those concerned with planning more effective speech therapy programmes in Canadian schools, the value of speech therapy should be investigated and the results reported.

STATEMENT OF THE PROBLEM

This investigation proposed to explore certain tangential areas testing the effectiveness of a speech therapy programme for children at the Grade Six level. Two Canadian school systems were investigated. One school system had provided speech therapy for ten years prior to the investigation, and the other school system had

²P. R. Campbell, "Speech Education in the English-Speaking Teacher Training Institutions of Canada" (unpublished Doctoral thesis, The University of Wisconsin, Madison, 1957); D. R. Kjarsgaard, "A Study of the Comparisons Between the Expressed Interest Towards the Literature Study Program and Speech Skill Proficiency of the North Vancouver High School Senior Classes" (unpublished Master's thesis, Western Washington College, Bellingham, 1962); Coombs, <u>loc. cit.</u>; Winifred Cory, Report to the British Columbia Speech and Hearing Association, February, 1958. (Mimeographed.)

provided the services of a Speech Consultant for three years prior to the investigation.

The areas investigated were:

- a. The number of speech misarticulations among Grade Six children.
- b. The efficacy of teacher identification of Grade Six children with speech misarticulations.
- c. Self-judgment of Grade Six children, of their adequacy in speaking and their feelings toward speaking situations.

DEFINITION OF TERMS

Among speech pathologists and speech therapists, it is generally agreed that the definition of a "speech defect" is a difficult one to standardize. Because of the subjective and arbitrary nature of evaluations of this kind, and the disabling nature of some slight speech problems, as opposed to the minor effects of more severe speech problems, it is advisable to use more specific terminology.

It has been stated, however, that when a speech defect exists, it tends to be primarily demoralizing and frustrating, and every speaker is affected by his own speech in ways that contribute heavily to all that is meant by individuality or personality.³

³Subcommittee on Articulation Problems, <u>Report</u> (Monograph Supplement No. 5, <u>Jour</u>. <u>Speech and Hear</u>. <u>Dis</u>., 1959).

Anderson has stated:

It must be concluded, therefore, that whether a given sample of speech deviates sufficiently from the norm to be conspicuous, and hence, to be defective, is, in the end, a matter of subjective judgment on the part of the person who hears it, provided intelligibility is not seriously affected.⁴

Another well-known speech therapist, Dr. Van Riper, has defined defective speech in this manner:

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.5

Throughout this report of the investigation, such terms as "speech handicapped," "speech defective," "speech deviate," will be used in reported contexts in the writers' words. These latter terms mean to this investigator that the various writers have considered these labels adequate in describing speech that has deviated from the average. In some reports the terms "speech therapist," "speech clinician," and "speech correctionist" are used. Such terms were interpreted by this investigator as synonymous, since they describe persons who are professionally trained in diagnosis and remedial areas to work with speech handicapped children and adults.

⁴V. A. Anderson, <u>Improving the Child's Speech</u> (New York: Oxford University Press, 1953), p. 37.

⁵C. Van Riper, <u>Speech Correction</u>, <u>Principles and</u> <u>Methods</u> (New York: Prentice-Hall, 1954), p. 19. While recognizing variations in subjective evaluations of speech deviations, it is essential that some standards, as set out by authorities in the field of speech therapy, be accepted. A number of surveys of the incidence of speech difficulties among school children have been made. Dr. Wendell Johnson⁶ made a summary of these surveys and conservatively estimated that four out of every one hundred school age children have speech or hearing handicaps of such severity that they are certain to go through life at a serious disadvantage vocationally, socially and personally if not given appropriate corrective attention. Table I, page six, is taken directly from Dr. Johnson's report.

It will be seen from this representative spread of the types of speech problems, that the majority of speech deviation's are classified under the term "articulation". In this study, the term "misarticulation" of speech sounds refers to any omission or distortion of a consonant sound, or to the substitution of one consonant sound for another, judged by this investigator on the specified test words. These misarticulations will be reported quantitatively, and the diagnosis of "speech defect" or "no speech defect" will not be used.

⁶Wendell Johnson, <u>Children With Speech and Hearing</u> <u>Impairment</u>, Bulletin No. 5 of the United States Department of Health, Education and Welfare (Washington: Government Printing Office, 1959).

TABLE I

ESTIMATED NUMBER PER 1,000 AND PER CENT OF SCHOOL-AGE CHILDREN WITH EACH TYPE OF SPEECH AND HEARING IMPAIRMENT (INCLUDES ONLY THOSE CHILDREN WITH SEVERE HANDICAPS)

Type of Impairment	Number per 1,000	Per cënt
Articulation problems	25	2.5
Voice problems	1	0.1
Fluency and rate problems	•5	.05
Stuttering	7	•7
Hearing problems of communicative and educational significance	5	•5
Speech problems associated with cleft palate and lip	• 5	.05
Retarded speech development	• 5	.05
Speech problems associated with cerebral palsy and other types of neuromuscular impairment	• 5	•05
Total	40	4.00

NOTE: Prevalence figures presented here are those of the author.

SOURCE: Johnson, op. cit., p. 6.

Since the diagnosis of speech difficulties is subjective and capable of different interpretations by different listeners, this study sought to eliminate a possible variable in the results by having the same investigator test children in both school systems.

LIMITATIONS OF THE PROBLEM

This study dealt with misarticulations of Grade Six children in "middle-class" economic areas who were known not to have any physical impairment that would affect their articulation of consonant sounds. It did not seek to explain any speech deviations on the basis of a contributory factor or factors. Instead, the adequacy or inadequacy of the articulated sounds was judged on the actual responses during the testing situation. Although reports on speech therapy on the children in School System A were available, similar reports on the children in School System B were unavailable. No case histories were taken. No examination of the oral mechanism was made, and no tests of sound discrimination ability were administered.

PLAN OF THE STUDY

A pilot study of thirty-three Grade Six children was undertaken and the results used to improve the organization and to determine the feasibility of the major study. Permission to conduct the major study was obtained from the Superintendents of two Canadian school systems. (See Appendix I.) School System A (with speech therapy) had a total school population of 48,383 children in the school year in which the investigation took place. School System

B had a school population of 65,559 in the same year, 1962-63. System A maintained a staff of nine speech and hearing therapists. System B employed one Speech Consultant whose duties were diagnostic and consultative. The Superintendents' offices were asked to select three or four schools in a "middle-class" economic area, from which at least three hundred Grade Six children could be tested.

When the schools were selected, letters were sent to the principals requesting their cooperation, and the cooperation of the Grade Six teachers (Appendix I). All Grade Six teachers who agreed to participate in this investigation were sent a letter requesting their cooperation in identifying all children who had misarticulations. In this letter, difficulties of articulation were described, and the teachers were asked to identify specific consonant sounds misarticulated (Appendix I). Questionnaires containing questions about speech and speaking ability were sent to the Grade Six teachers, and they were asked to administer these to their students prior to the investigator's visit to the school. (See Appendix II.)

On the day or days of the investigator's visit to the school, each Grade Six child was interviewed individually. The child's name, birthdate, and father's occupation were

recorded. Each child was told that the investigator wished his assistance in carrying out a project with all the Grade Six children in the school. The child was shown a list of thirty-three words, and asked to make a short sentence using each word. These words represented tests for twelve consonants: ten consonants being tested in the initial, medial and final positions, two consonants tested in the initial and medial positions, and one consonant tested in the medial position only. The investigator listened to the production of the sound being tested, and recorded whether the sound was correct, distorted, omitted, or whether another sound was substituted.

The results of the Pupil Questionnaire, the teachers^t referrals and identifications, and the assessment of the investigator were recorded on individual master sheets so that the information could be transferred to IBM cards. The Minnesota Scale of Paternal Occupation was used in categorizing the fathers¹ occupations.

All testing took place between January 25, 1963 and April 12, 1963.

HYPOTHESIS

In investigating differences in speech misarticulations of Grade Six children in two school systems, the

investigator accepted a null hypothesis, namely, that speech therapy in the elementary schools, measured by the investigations of this study, does not result in a statistically significant reduction in speech misarticulations at the Grade Six level.

CHAPTER II

BACKGROUND OF THE STUDY

CLASSIFICATION AND INCIDENCE OF SPEECH PROBLEMS

In the previous chapter, some indication has been given of the difficulty in classifying and identifying speech deviations. Dr. Wendell Johnson's summary of several studies was reported. In reviewing other investigations into the types of problems, the incidence, and particularly the incidence at certain age levels, it is apparent that Dr. Johnson's estimate of four per cent speech problems among school-age children is a conservative one.

The Scottish Education Department¹ has estimated that five to six per cent of pupils in the primary grades have speech difficulties that warrant therapy. Milisen² has pointed out that reports of speech disorders in the general population vary so much, that it is necessary to attempt a summary statement which may estimate a median incidence. He states:

¹Great Britain Scottish Education Department, <u>Pupils</u> <u>Handicapped by Speech Disorders</u> (London: H. M. Printing Office, 1951), p. 33.

²Robert Milisen, "The Incidence of Speech Disorders," <u>Handbook of Speech Pathology</u>, Lee Edward Travis, ed. (New York: Appleton, Century, Crofts, 1957), pp. 246-266.

From kindergarten through fourth-grade level roughly 12 to 15 per cent of the children have seriously defective speech. In the next four grades, between 4 and 5 per cent are seriously defective. General estimates above the eighth grade are based on highly selected samples and therefore the best guess as to the incidence would be about the same as for the upper elementary grades--4 to 5 per cent.3

Among the studies reported are those of Roe and Milisen⁴ in the elementary schools, Sayler⁵ and Morris⁶ in the secondary schools.

Morley' reported the results of speech tests given to incoming and transfer students at the University of Michigan over a ten-year period and found the incidence for the entire period to be 3.85 per cent classified as clinical cases, and of the number, 1.9 per cent were articulatory problems.

³Milisen, <u>op</u>. <u>cit</u>., p. 246.

⁴Vivian Roe and Robert Milisen, "The Effect of Maturation Upon Defective Articulation in Elementary Grades," Jour. Speech Dis., 7:37-50, 1942.

⁵Helen K. Sayler, "The Effect of Maturation Upon Defective Articulation in Grades Seven Through Twelve," Jour. Speech and Hear. Dis., 14:202-207, September 1949.

⁶Morris, <u>loc</u>. <u>cit</u>.

⁷D. E. Morley, "A Ten-Year Survey of Speech Disorders Among University Students," <u>Jour. Speech and Hear. Dis.</u>, 17:25-31, March 1952. On the other hand, it is interesting to note the report of a study made by Newman⁸ of the results of a questionnaire given by the National Health Survey in 1957-58. Interviews with 36,000 households representing 115,000 persons revealed that only .65 of one per cent of the population were considered speech impaired, judged by the "lay" persons interviewed.

In an attempt to analyze the "normal" responses of first grade children, Snow⁹ has presented a detailed analysis of articulation responses of 438 children. This study bears out the fact that although the number and type of misarticulations may vary because of the phonetic environment of the sound in a particular word, there are a considerable number of misarticulations among Grade One children.

In summary then, it has been found that the results of studies of speech problems result in a wide variation in incidence. All studies do agree, however, that the largest percentage of these problems is in articulation, and that there is a definite decrease in incidence with age and maturation.

⁸P. W. Newman, "Speech Impaired?" <u>ASHA</u>, 3:9-10, January, 1961.

⁹K. Snow, "A Detailed Analysis of Articulation Responses of "Normal" First Grade Children," <u>Jour</u>. <u>Speech</u> <u>and Hear</u>. <u>Res</u>. 6:277-290, September, 1963.

EFFECT OF MATURATION UPON ARTICULATION SKILLS

The maturational aspects of articulation problems have been comprehensively studied by Poole,¹⁰ Wellman,¹¹ and more recently, Templin.¹² According to these studies, a small percentage of children does not achieve proficiency in all consonant sounds until the age of seven and one-half or eight years.

From the standpoint of efficiency of a speech therapy programme, it would be desirable to select those children for speech therapy who will probably not improve with maturation and development. Van Hattum¹³ has reviewed the problem of referral overload to the speech therapists in the Rochester Schools, and stated that when a developmental concept was used in selecting children with articulation problems for therapy, only 6.6 per cent of the school

¹⁰Irene Poole, "Genetic Development in Articulation of Consonant Sounds in Speech," <u>Elem. English</u>, 11:159-161, June, 1934.

¹¹B. L. Wellman and others, <u>Speech Sounds of Young</u> <u>Children</u>, University of Iowa Studies in Child Welfare, Vol. V, No. 2 (Iowa City: University of Iowa Press, 1931).

¹²Mildred Templin, <u>Certain Language Skills in</u> <u>Children. Their Development and Interrelationships</u>, Monograph No. 26, Institute of Child Welfare, The University of Minnesota (Minneapolis: The University of Minnesota Press, 1957).

¹³Rolland J. Van Hattum, "Evaluating Elementary School Speech Therapy," <u>Exc. Children</u>, 25:411-414, May, 1959.

population received therapy as compared to 12.5 per cent who received therapy in the previous year. He states, however,

It appears that therapists are without foundation in excluding children below the third grade from their caseloads, or excluding kindergarten children, or including all of them. In fact, by including children with speech errors one may be in error approximately three out of four times. By working with none of them one may be in error only about one out of four times.14

Steer and Drexler¹⁵ tested Grade Five children who were first examined in kindergarten, and on the basis of articulatory testing of those who retained their speech difficulties, devised a formula for predicting improved articulation through maturation alone. This formula made use of the kindergarten Level Score on the Templin articulatory test, and placed a high value on the defectiveness of the sounds of \underline{f} , \underline{l} , and voiceless \underline{th} .

Dickson's investigation¹⁶ of three areas, motor proficiency, auditory discrimination, and emotional characteristics of the parents, indicated that children who did

¹⁴Van Hattum, <u>op</u>. <u>cit</u>., p. 412.

¹⁵M. D. Steer and Hazel Drexler, "Predicting Later Articulation Ability From Kindergarten Tests," <u>Jour. Speech</u> and <u>Hear. Dis.</u>, 25:391-397, November, 1960.

¹⁶S. Dickson, "Differences Between Children Who Spontaneously Outgrow and Children Who Retain Functional Articulation Errors," <u>Jour. Speech and Hear. Res.</u>, 5:263-271, September, 1962. not outgrow their articulation problems were significantly poorer in motor proficiency skills as measured by the Oseretsky test, and that there was a significant difference in the MMPI (Minnesota Multiphasic Personality Inventory) neurotic tendencies of the mothers of the children who did not outgrow their articulation problems, as compared to the mothers of children who outgrew their articulatory problems.

Artley¹⁷ concluded that speech defects may be the cause of reading defects, the results of reading defects, or that both may result from the same factor.

From a summary of the literature on the maturational, or developmental aspect of articulatory skills, it is seen that some children do outgrow their articulation problems, and, in order to increase the efficiency of any speech therapy programme in the public schools, a measure of predictability, particularly in articulation problems, would be useful.

THE RELATIONSHIP OF ARTICULATORY SKILLS TO OTHER AREAS OF CHILDHOOD DEVELOPMENT

Some measure of predictability of articulatory improvement would be useful in reducing the therapists¹ caseload, intensifying the remedial work for more severe

¹⁷A. S. Artley, "A Study of Certain Factors Presumed to be Associated with Reading and Speech Difficulties," <u>Jour. Speech and Hear. Dis.</u>, 13:351-360, December, 1948.

cases, and more successfully integrating the special services of the speech therapists in the public school. Questions growing out of such an approach would seek to clarify such relationships as the effect of speech problems upon academic skills and social adjustment, the optimum time for therapy, the number of speech therapy sessions needed, and the reactions of adults, particularly the classroom teacher, towards children with speech deviations.

The problem of social relationships and peer evaluation may be an extremely important one for a young child who does not articulate adequately. Contradictory evidence in this area is found. Freeman and Sonnega¹⁸ Brissey and Trotter¹⁹ found that social position was not necessarily related to the degree of communicative handicap, whereas Woods and Carros²⁰ concluded from a larger number of public school elementary school children that a child with a speech defect tended to be less acceptable than a non-speech defective. Giolas and Williams²¹ were interested in

¹⁸G. G. Freeman and J. A. Sonnega, "Peer Evaluation of Children in Speech Correction Class," <u>Jour. Speech</u> and <u>Hear. Dis.</u>, 21:179-182, June, 1956.

¹⁹F. L. Brissey and W. Trotter, "Social Relationships Among Speech Defective Children," <u>Jour. Speech and Hear. Dis.</u>, 20:277-283, September, 1955.

²⁰Sister Frances Jerome Woods and Sister Mary Arthur Carros, "Choice Rejection Status of Speech Defective Children," J. Exc. Children, 25:279-283, February, 1959.

²¹T. G. Giolas and D. Williams, "Children's Reactions to Nonfluencies in Adult Speech," <u>Jour. Speech and Hear. Res.</u>, 1:86-93, March, 1958.

discovering whether children were aware of non-fluencies in the speech of peers, and they concluded that they were not only aware of the speech deviations, but they they also reacted unfavourably to the non-fluencies.

Stark, in discussing the effect of a speech difficulty on learning has stated:

The speech handicapped child is also faced with the problem of social isolationism and severe ridiculing. He often has a history of teasing which extends back to early preschool years. While many children can buffer teasing with such adages as "sticks and stones" . . this child has been subjected to unusual pressures. Because he always had trouble making himself understood, it was always hard for him to relate to his peers.²²

Solomon²³ found that first grade children with articulatory problems exhibited more behaviour problems, particularly in the passivity-submissive category, than did children who did not have articulatory problems.

In the area of auditory discrimination, Wepman²⁴ on the basis of results of administering auditory discrimination tests to children with poor reading scores, and also

²²J. Stark, "How Does a Speech Handicap Affect Learning?" <u>Elem. English</u>, 40:830-832, January-December, 1963.

²³A. Solomon, "Emotional and Behavior Problems of First Grade Children With Functional Defects of Articulation" (unpublished Doctoral thesis, Stanford University, Stanford, 1960).

²⁴J. Wepman, "Auditory Discrimination, Speech and Reading," <u>Elem. School Jour</u>., 60:325-333, March, 1960. to children with poor articulation, suggests that each child should be studied to determine whether his auditory abilities have reached the level of maturation at which he could benefit from phonic instruction in reading or from auditory training in speech.

Cohen and Diehl²⁵ duplicated an earlier study by Dronvall and Diehl and stressed that major emphasis should be placed on improving sound discrimination ability in children with articulation problems, as they demonstrated a significant weakness in auditory discrimination.

Prins²⁶ looked for evidence among children with developmental articulation disorders of specific relations between their sound deviations of articulation and scores on a clinical measure of sound discrimination ability. He concluded that in children with defective articulation, the speech sound discrimination ability could not be meaningfully evaluated as independent of the language process.

²⁵J. H. Cohen and C. F. Diehl, "Relation of Speech-Sound Discrimination Ability to Articulation-Type Speech Defect," <u>Jour. Speech and Hear. Dis.</u>, 28:187-190, May, 1963.

²⁰D. Prins, "Relations Among Specific Articulatory Deviations and Responses To a Clinical Measure of Sound Discrimination Ability," <u>Jour. Speech and Hear. Dis.</u>, 28: 161-168, June, 1962.

Aungst and Frick²⁷ investigated sound discrimination ability as related to the articulation of a particular consonant, the <u>r</u>. Their findings indicated that the traditional speech-sound discrimination tests sample an ability which is well established by eight years of age and is not related to articulation defects which persist after that age. They concluded:

The ability to judge one's own speech production is significantly related to the consistency of articulation; therefore, tests of this ability should prove to be valuable in diagnosis, therapy and research.²⁸

In other areas, Irwin²⁹ investigated the effects of speech therapy upon certain linguistic skills of first grade children, and found that although trends were indicated in favour of the groups receiving speech therapy, no significant differences were observed. She suggested that further studies of the effect of speech therapy on linguistic skills was indicated.

²⁷Lester F. Aungst and James V. Frick, "Auditory Discrimination Ability and Consistency of Articulation of /r/," <u>Jour. Speech and Hear. Dis.</u>, 29:76-85, February, 1964.

²⁹R. B. Irwin, "The Effects of Speech Therapy Upon Certain Linguistic Skills of First-Grade Children," <u>Jour</u>. <u>Speech and Hear</u>. <u>Dis</u>., 28:375-381, November, 1963.

²⁸<u>Ibid</u>., p. 83.

Sommers and others³⁰ in carrying on a longitudinal study of the relationship between speech improvement and reading ability, have concluded, to date, that subjects who were provided with speech improvement both in first and second grades made significantly higher reading factor scores at the end of the second grade than did subjects who were not provided with speech improvement. They also found no significant difference in the improvement of reading factor scores for first-grade subjects who received sixteen weeks of speech improvement compared with those who received nine months of this treatment.

Carrell and Pendergast³¹ investigated the relationship between spelling ability and speech difficulties at the Grade Three level and found no significant differences between children with articulatory problems and those who did not have speech problems.

Because of the complexity of the speech process, it is difficult to assess the individual's past and present efforts to cover up, or to correct a speech difficulty

³⁰Ronald Sommers, "Effects of Various Durations of Speech Improvement Upon Articulation and Reading," <u>Jour</u>. <u>Speech and Hear</u>. <u>Dis</u>., 27:54-61, February, 1962.

³¹J. Carrell and K. Pendergast, "An Experimental Study of the Possible Relations Between Errors of Speech and Spelling," <u>Jour. Speech and Hear. Dis.</u>, 19:327-334, September, 1954.

unless professional speech evaluations have been recorded. Few longitudinal studies have been done to give us the necessary insight into the compensations children tend to make in their own attempts to improve speech that seems different. It is, therefore, interesting to look at the study made by Kjarsgaard³², who found a significant relationship between expressed interest in the literature study programme and speech skill proficiency of high school students. Glasgow³³ also explored the relationship between the sound spectra of voice and speech and associated variations in secondary school audiences[†] visual and auditory images, moods, ideas and literary values. The judges in his experiment listened to two similar passages, and all showed preferences for the selection read with speech mannerisms that were good rather than those read with "poor speech mannerisms" Glasgow concluded that speech manner is an important factor in the educational development of potential literary appreciations and insights.

32Kjarsgaard, op. cit.

³³G. M. Glasgow, "The Effects of Manner of Speech on Appreciation of Spoken Literature," <u>J. Ed. Psych.</u>, 52:322-325, December, 1961.

SELF-JUDGMENT OF SPEECH ABILITIES

In surveying the literature regarding the value of speech therapy for speech disorders of children and adults, the importance of the feelings of the defective speaker is repeatedly expressed, or suggested. Most definitions of speech problems include reference to the attitude of the person with the speech problem. For instance, Van Riper states that "Speech is defective when [it] causes its possessor to be maladjusted."³⁴ Milisen states:

A speech defect refers to a deviation which at any moment is sufficiently severe . . . to interfere with communication or affect adversely either the speaker or the listener.35

Goodstein states:

It is obvious that speech disorders like all other obvious anomalies, have a social stimulus value, and the resultant personality of the handicapped individual is partially formed by the responses of others to the handicap.36

An inspection of the case history forms of most speech and hearing clinics reveals many questions concerning

³⁴Van Riper, <u>op</u>. <u>cit</u>.,p. 19.

35_{Milisen, op. cit., p. 248.}

³⁶Leonard D. Goodstein, "Functional Speech Disorders and Personality; Methodological and Theoretical Considerations," Jour. Speech and Hear. Res., 1:377-382, December, 1958. the client's or speech handicapped person's reactions to situations that might point up the speech problem. Questions concerning avoidances of situations, or withdrawal from situations because of poor speaking ability are common. Johnson, Darley and Spriestersbach³⁷ provide a lengthy questionnaire for stutterers, asking their opinion about such statements as:

- 27. A stutterer should try to be hired for jobs requiring little speaking--for example, janitor or wrapping clerk.
 - Strongly agree Moderately agree Undecided Moderately disagree Strongly disagree38
- 36. A stutterer should not plan to be a lawyer.

Strongly agree Moderately agree Undecided Moderately disagree Strongly disagree39 Siegenthaler and Flamm⁴⁰ compared subjects[†] ratings of their own speaking ability with the ratings made by a group of clinicians. They found that the subjects tended to rate their speech skills higher than those skills were rated by judges listening to the recordings. They concluded

³⁷W. Johnson, F. Darley and D. Spriestersbach, <u>Diagnostic Manual in Speech Correction</u> (New York: Harper, 1952).

- ³⁸Ibid., p. 14.
- ³⁹<u>Ibid</u>., p. 146.

⁴⁰Bruce M. Siegenthaler and Marshall G. Flamm, "Subjects' Self-Judgments of Speech Adequacy and Judgments of Trained Observers," <u>Jour. Speech and Hear. Dis.</u>, 26:244-251, August, 1961.

that it is:

Possible that benefits from therapy other than improved speech played a role in the findings. That is, other benefits may have caused the subjects to look favorably upon the therapeutic experience and to generalize this to speech . . . these included improved socialemotional adjustment, a healthier attitude toward speech, and a widening range of interests and experience.

Backus⁴² has stressed the fact that speech constitutes

a particular form of behaviour for human relationships and

states:

Speech is viewed in psychological terms for all persons, not just for those judged to have "maladjustments," nor just for those judged to have "speech disorders." The concept of a dichotomy between normal and disordered speech may have convenience administratively in speech departments, but it is not considered relevant in discovering causal relations in a client's behavior. For instance, available evidence appears to indicate that the same laws which govern phenomena called "stagefright" in the classroom, govern phenomena called "anxiety" in the clinic.⁴3

Levin and colleagues⁴⁴ studied two aspects of children[†]s speech: the amount of time the child spent in talking and the number of errors he made during his discourse under varying conditions. The purpose of the study was to predict each of these speech behaviours from

⁴¹Siegenthaler and Elamm, <u>op</u>. <u>cit</u>., p. 244.

⁴²Ollie Backus, "Group Structure in Speech Therapy," <u>Handbook of Speech Pathology</u>, Lee Edward Travis, ed. (New York: Appleton, Century, Crofts, 1957), pp. 1025-1064.

⁴³<u>Ibid</u>., p. 1036.

⁴⁴Harry Levin, "Audience Stress, Personality and Speech," <u>J.Abn.Soc.Psych</u>, 61:469-473, 1960.

situation factors, the number of people listening to the child, and from two personality dispositions which were labeled "Exhibitionism" and "Self-Consciousness". They concluded that most speech errors are made by children who are in conflict over public performance (high scorers in both Exhibitionism and Self-Consciousness) and fewest errors made by Exhibitionist children who showed little apprehension about exposure to public speaking. They concluded:

Public approval for goal attainment appears to be a dominant motive for some people. It seems to us useful, therefore, to make a distinction between pure achievement, where public performance is not relevant, and exhibitionist achievement, where reaching the goal is simply instrumental to public approbation.45

Although this study was carried out with children with no speech difficulties, the conclusions are worthy of consideration in this present study.

From these reports of investigations dealing with the feelings of the speech handicapped person, one readily recognizes the need to secure some measure of the speaker's self-judgment in evaluating a programme of speech therapy.

45_{Levin}, op. cit., p.473.
THE PLACE OF SPEECH THERAPY IN THE PUBLIC SCHOOLS

From the foregoing discussion, it is evident that areas of speech proficiency and speech deviations are related to the established programmes in the public schools. One of the most difficult decisions to be made by administrators is that of defining the extent of the responsibility of the public schools for helping each student attain his highest potentials through planned curriculum. As the 1960 B. C. Royal Commission on Education stated:

The objectives of training for citizenship and developing individual abilities are so interrelated that one cannot be satisfactorily achieved without the other.46

Most large school systems in the United States have felt that their obligation to the speech handicapped child was clearly expressed in "developing individual abilities", and have provided facilities within the school system for those children requiring specialized teaching or therapy in the area of speech.

The development of speech therapy services in the public schools began on this continent in 1910, when the

46 British Columbia Royal Commission on Education, <u>A Precis</u> (Victoria: Queen's Printer, 1960), p. 5.

Chicago Public School System provided remedial services for speech defective children. By 1953, some thirty State Departments of Education had established certification requirements for public school speech clinicians, and an estimated 4,000 individuals were employed in such positions.⁴⁷

The American Speech and Hearing Association is the recognized certifying body for professionally qualified speech and hearing therapists, and its most recent Directory⁴⁸ states that approximately 11,000 persons are members of this Association. Based on previous estimates⁴⁹ we can assume that over half of this number is now engaged in public school work. It is interesting to note that this Directory lists seventy-eight Canadians as members, with only nineteen of them holding professional certification. Twelve of the seventy-eight Canadian members work in public schools.

⁴⁷United States Office of Education Cooperative Research Project, "Public School Speech and Hearing Services," Monograph Supplement No. 8, Jour. Speech and Hear. Dis., 1961, p. 1.

⁴⁸American Speech and Hearing Association, <u>1964</u> <u>Directory</u>, K. O. Johnson, editor. Washington: American Speech and Hearing Association, 1964.

⁴⁹American Speech and Hearing Committee on the Midcentury White House Conference, "Speech Disorders and Speech Correction," <u>Jour. Speech and Hear. Dis.</u>, 17:129-137, June, 1952, p. 6.

In an article addressed to educational administrators and superintendents, Schiefelbusch⁵⁰ emphasized that the areas of speech and hearing covered, in their patterns of training, all types of services offered in special education, and should surely claim to be basic areas in the field of special education. He pointed out that in the United States Biennial Survey of Education Report of 1952-53, more than sixty per cent of the children receiving special education were those children with speech problems. He stressed that most school systems planned for ten per cent of the school population to receive special help in speech. It was estimated that four per cent of this group could be helped by guidance from the classroom teacher, five per cent helped by reeducative measures with the speech therapist, and one per cent was beyond the scope of the public school speech therapist.

Milisen⁵¹ has emphasized that the public schools are the most logical area of rehabilitation of speech defective

⁵⁰R. L. Schiefelbusch, "Speech and Hearing as It Relates to Special Education," <u>Bibliography of Educational</u> <u>Administrators and Supervisors</u>, 45:7-12, January, 1959.

⁵¹R. Milisen, "Public Schools as a Site for Speech and Hearing," <u>Speech Teacher</u>, 12:1-9, January, 1963.

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children, as many of the principles involved in educating the so-called "normal" child are the same as those of the handicapped. He also stressed that most parents turn to the school for the solution to learning problems in their children, and that through the school, a massive preventive therapy programme in speech deviations could be achieved.

In a panel discussion of members of the American Speech and Hearing Association, the recognized body on the North American Continent for Certification Standards,⁵² impending higher requirements for membership were discussed. These higher requirements were urged, as the panelists concurred that a speech therapist in the public school setting should be competent to provide diagnostic as well as remedial procedures. A speech therapist should be able to identify areas related to and affecting total speech performance, such as perceptual ability, dominance, global language ability, motor and sensory factors, social and emotional status, auditory status, and many other areas of a related nature.

It has been recommended that one speech therapist be appointed for every 5,000 elementary school children.⁵³

⁵²American Speech and Hearing Association, <u>loc. cit.</u> ⁵³British Columbia Speech and Hearing Association, "Brief to the Royal Commission on Education, Province of British Columbia," January, 1959. (Mimeographed.)

Any attempt on the part of all school boards to implement this recommendation could not possibly succeed unless more qualified speech therapists were trained. For instance, British Columbia's total school enrolment in 1962-63, 358,900, would require the services of seventy-one or seventy-two trained speech and hearing therapists.

Certain investigations have explored the possibility of "Speech Improvement" activities as a part of classroom procedures to supplement the work of the trained speech therapist. The committee investigating this area for the American Speech and Hearing Survey, defined speech improvement in this manner:

• • speech improvement takes place in the classroom. It consists of systematic instruction in oral communication which has as its purpose the development of articulation, voice and language abilities that enable all children to communicate their ideas effectively.54

Darley and Hanlin summarized the research of this same committee by stating:

The implementation of effective speech improvement programs in close relationship to remedial speech programs brings within the realm of possibility the dream of adequate speech help for all children and suggests that the total number of highly trained clinicians needed to deal with speech-and-hearing handicapped children can be scaled down to a finite number. 22

⁵⁴United States Office of Education Cooperative Research Project, "Public School Speech and Hearing Services," <u>op. cit.</u>, p. 78. 55

<u>Ibid.</u>, p. 129.

A programme of speech improvement relies heavily upon the classroom teacher's knowledge of speech defects. her desire to help all children to improve their speaking ability, and her ability to integrate a speech programme into the academic programme. Lloyd and Ainsworth⁵⁶ investigated attitudes of classroom teachers toward speech problems and the additional responsibility placed on the teacher in conducting speech improvement activities. They found, in their limited study, that the teachers tended to turn over all speech correction work to the speech therapist, and did not become greatly involved in remedial They concluded that it would take a considerable procedures. amount of diplomatic and educationally sound training to get teachers to accept the more nearly ideal method of cooperative attack on speech problems.

Diehl and Stinnett⁵⁷ investigated the efficiency of teacher referrals in a school speech testing programme, in a school system with no therapy, and found that teachers missed forty per cent of the speech defective children a trained speech therapist later identified. However, these

⁵⁶G. Lloyd and S. Ainsworth, "The Classroom Teacher's Activities and Attitudes Relating to Speech Correction," <u>Jour. Speech and Hear. Dis.</u>, 19:244-249, June, 1954.

⁵⁷C. Diehl and C. Stinnett, "Efficiency of Teacher Referrals in a School Speech Testing Program," <u>Jour. Speech</u> <u>and Hear. Dis.</u>, 24:34-36, February, 1959.

same teachers were able to identify eighty per cent of the children with severe types of articulation problems.

According to a comprehensive survey carried out by the American Speech and Hearing Association in cooperation with the United States Office of Education and Purdue University⁵⁸ the results showed that most States had accepted the responsibility of providing some type of speech therapy or consultative services for children handicapped by speech problems. The trend was to increase the value of the training of the public school therapists so that they could more effectively integrate their skills in a public school programme of diagnosis and remedial work.

CANADIAN STUDIES OF SPEECH PROBLEMS

Few studies of speech problems among Canadian children and adults have been carried out. Cory⁵⁹ sent questionnaires to superintendents of twelve school boards throughout Canada in 1957, But few superintendents were able to give figures to the question, "How many children

⁵⁸United States Office of Education Cooperative Research Project, "Public School Speech and Hearing Services," <u>loc. cit</u>.

⁵⁹Cory, <u>loc</u>. <u>cit</u>.

do you have who need speech correction work?" Winnipeg replied that its survey matched the national figures prior to 1952, ten to fifteen per cent, and since 1952, five to ten per cent. Cory also found that not many cities employed fully qualified speech therapists in the public schools, and that this number ranged from none, in three cities, to seven in two cities. In February 1964, the present investigator sent questionnaires to the twelve school boards Cory had contacted and found that there had been an increase in the number of speech therapists employed in the public school systems. A copy of this letter is found in Appendix I.

A comparison of some of the findings of Cory's investigations and those of the present researcher appear in Table II on the following page.

In an earlier study (1955) Campbell⁶⁰ obtained information regarding speech education from the English speaking teacher training institutions of Canada. Among other findings, she interpreted the returns to her questionnaires as suggesting that further study be done in a field that might be defined, in the present investigator's opinion, in part as "articulation problems". Campbell stated:

60_{Campbell, loc. cit.}

TABLE	Ι	Ι
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COMPARISON OF RESULTS OF QUESTIONNAIRES SENT TO TWELVE CANADIAN SCHOOL BOARDS IN 1957 AND IN 1964

		Number of Speech Therapists		Estimated number of school popula speech problems	r or per cent ation with	Total enrolment		
		1957	1964	1957	1964	1964		
1.	Regina	0	2	60 per year	6% or 900	15,000 ^e		
2.	Ottawa	5	11		5% or 1,255	25,000 ^e		
3.	Calgary	1	none	no survey	5% or 2,689	53,771		
4.	Edmonton		1/2		12%	48,395		
5.	Victoria	l/2 time	1/2 time	75-100 in 18,500 school population	2%	26,660		
6.	Toronto	7	10 (in elementary schools	1,000	5% or higher 4,476	89,535		
7.	Montreal (Prot.)	3	и ц		3-5%	64,242		
8.	Montreal (Cath.)	1	not reported	not reported	not reported			
9.	Halifax	1	ı	not reported	1-2%	17,992		
10.	Vancouver	0	l con-	not reported	4-5%	6 6,981		
11.	Winnipeg	7	9	5-10%	5-8%	48,133		
12.	Saskatoon			ويعرب المراجع المراجع المراجع المراجع والمحاولة والمحاومة والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع				

NOTE: 1957 figures taken from Cory, <u>loc. cit</u>.

e = Elementary schools

Because poor enunciation and lack of clear-cut speech were cited so often as a fault by the respondents to the questionnaire, perhaps a study concerned with the whole field of clearness of diction might be one which could yield fruitful results.61

Kjarsgaard studied oral reading skill and interest in literature in 155 Grade Twelve British Columbia students and stressed that:

Interest in literature and speech skill in reading were found to have a significantly strong relationship and, since speech skills can be taught, it may be that interest in literature can be raised by teaching of speech skill. It may be that grade average can be raised also by the teaching of speech because speech skill, interest, and grade average in literature all inter-correlate at the same significant strength.⁶²

Coombs⁶³ stressed the fact that few surveys had been made in Canada, and tested fifteen per cent (or 1,809) of the elementary school children in Saskatoon public schools on a modification of the Bryngelson-Glaspey speech test. He wished to ascertain the proportion of children exhibiting articulation inaccuracies from Grade One to Eight; to describe changes in the articulation of speech sounds from Grades One to Eight, and to investigate changes in the articulation of speech sounds after oral stimulation

⁶¹Campbell, <u>op</u>. <u>cit</u>., p. 197.

⁶²Kjarsgaard, <u>op</u>. <u>cit</u>., p. 2.

⁶³William D. Coombs, "The Development of Articulated Speech Sounds in the Elementary School" (Saskatoon: The University of Saskatchewan, 1963). (Mimeographed.) from Grades One to Five. His analysis of the results was concerned primarily with the percentage of pupils showing some inaccuracy in articulation. For instance, he found 31.77 per cent of Grade Six children with one or more misarticulations.⁶⁴ He concluded that his study might serve as a standard of maturation for speech sounds. The articulation of any child could be compared with that of a large sample of children in his grade. His results were similar to those conclusions reached earlier by Milisen,⁶⁵ namely, that there was rapid improvement of the production of articulation speech sounds in the primary grades, but that the proportion of children with misarticulations did not decrease significantly as the grade level increased beyond Grade Three.

In summarizing the studies of speech skills and speech surveys done with Canadian schools and teacher training institutes, it appears that the problems are similar to those reported by American investigators. The survey type analysis of articulation difficulties in the elementary grades by Coombs, the related speech and

> ⁶⁴Coombs, <u>op</u>. <u>cit</u>., p. 12. ⁶⁵Milisen, <u>loc</u>. <u>cit</u>.

A

literature interest areas reported by Kjarsgaard, and the reports of teacher training institutions of poor diction and enunciation among their students, suggest that Canadian children do not all outgrow their speech difficulties, and that this can be a cause of concern in academic fields beyond the elementary school level. Cory's study and the questionnaire follow-up by the present investigator suggest that facilities for speech training are inadequate in the public school systems in Canada.

VALUE OF THIS STUDY

Scientific research in the field of speech disorders has been both intensive and extensive during the past forty years. Many excellent studies have dealt with highly specialized areas, but there has been a growing recognition of the need to investigate more fully the area where the greatest number of speech problems are seen, namely, in the public schools.

The Subcommittee on Articulation Problems, in reporting to the American Speech and Hearing Association on Research Needs in Speech Pathology and Audiology, made recommendations concerning general research needs. They stated:

It is desirable to have more descriptive studies not involving rigid experimental or statistical procedures. Much more descriptive information is needed as a basis for designing controlled experiments.⁶⁶

These recommendations were partially carried out when the American Speech and Hearing Association cooperated with the U. S. Office of Education and Purdue University in an extensive survey of speech and hearing therapy in the public schools in the United States. In their report, published July, 1961, the following appears:

The logical laboratory for research is the public schools themselves. Too often when research has been concerned with public school children, the school has been used only as a convenient place to meet the children to be studied. Future research needs to be focused on the children as they function in public school situations. The entire school program must receive research consideration.⁶⁷

In assessing the value of speech therapy as a special service in the schools, administration must define terminology used by many different investigators, assess the estimated percentages of speech problems and apply these criteria to the needs of their particular school systems.

The Canadian administrator has been especially handicapped by the few studies carried out in Canadian

⁶⁶Subcommittee on Articulation Problems, <u>Report</u>, Monograph Supplement No. 5, <u>Jour. Speech and Hear. Dis.</u>, 1959, p. 16.

⁶⁷United States Office of Education Cooperative Research Project, "Public School Speech and Hearing Services," <u>op. cit.</u>, p. 119.

public schools, and must make use of statistics and standards of speech from other countries.

This present research was planned so that some of the variables found in other surveys could be eliminated. The same investigator assessed the speech of children in two Canadian school systems.

CHAPTER III

METHODOLOGY

PILOT STUDY

In order to test the effectiveness of the organization of the planned major study, and to correlate the judgments of the investigator with the judgments of another speech therapist, a Pilot Study was carried out in a school system not included in the major study.

The superintendent of the school system was asked to select a school of "middle-class" economic standing, where the middle group of Grade Six students could be tested. The total number of the class was thirty-three, eighteen boys and fifteen girls.

The investigator, who holds Basic Certification with the American Speech and Hearing Association, and another speech therapist, with the same professional qualifications, visited the school. All Grade Six children to be tested were asked to answer the questionnaire. Following the completion of this part of the investigation, the pupils were sent, one by one, to the testing room.

In the testing room, the students were given a set of typed instructions and a word list (Appendix II). Each child was told to begin with his sentences when he was ready. Each observer scored each child on separate testing sheets (Appendix II). The individual testing was completed within three hours. This testing time averaged approximately five minutes for each child, although some children were much slower in their responses than others.

In assessing the Pilot Study, the investigator found that her working time in the school could be used to better advantage by asking the teachers to give the questionnaire to the children before the investigator arrived at the school. Otherwise, it was not necessary to make any changes in the procedure planned for the major study.

The following table shows the tabulation for the number of defective consonants found in the speech of the thirty-three children as judged by Observers A and B.

Incorrect	Observer A	Observer B
S Z r Th (vl) Th. L CH Sh	37 35 0 7 2 2 6 11	19 21 2 10 2 2 3 13
ZH (* J V F	0 1 1 0	5 3 0

TABLE III

The coefficient of correlation for this number of defective consonants, using the Pearson $\frac{1}{\sqrt{2}}$ r correlation coefficient was r = .90.

The scores on the rating sheets of the thirty-three children were also correlated by the Pearson r, using the data in the following table. In this case, r = .55.

	مەربىي 10 مىر مەربىي مىر مىر مىر مىر مەربىي مەر				
Child	Observer A	Observer B	Child	Observer A	Observer B
12345678901123456	25 90 00 28 16 37 98 82 91 98	$ \begin{array}{c} 0 \\ 0 \\ 2 \\ 0 \\ 10 \\ 32 \\ 11 \\ 5 \\ 21 \\ 6 \\ 34 \\ 14 \\ 6 \\ 0 \end{array} $	17 18 19 21 22 23 25 27 28 29 31 32 33	8 0 2 4 7 0 10 7 5 8 8 8 0 4 0 0 9	23 0 10 0 5 36 0 30 0 30 0 8 18 0 20 0 0 17

TABLE IV

NUMBER OF ERRORS (WEIGHED SCORE)

The value of the second correlation was much lower as it took into account not only the relative judgments of Observers A and B, but also the rating system. It will be seen, that the Individual Rating Sheet (Appendix II) gives a weighed score to each consonant. A different judgment of the two observers of one consonant which had a very high numerical rating (i.e., $\underline{j}, \underline{v}$, or \underline{f}) would lower the correlation coefficient quite considerably, whereas greater discrepancies in lower rating consonants would have a relatively small effect on the value of r.

PLAN OF THE MAJOR STUDY

This study investigated the following aspects of speech deviations and judgments of speech deviations in two Canadian School Systems. One System provided speech therapy and the other provided Speech Consultant services only. Specifically, the following areas were investigated:

- 1. The null hypothesis was asserted that children at the Grade Six level in a school system providing speech therapy, when compared to children from another school system having no speech therapy, would not make higher scores on a speech test administered by the same tester.
- 2A. When Grade Six teachers are given instructions asking them to identify children in their classes with speech misarticulations, how do their judgments compare with

the judgments of a trained speech therapist?

- 2B. When these same teachers are asked to judge the handicapping effect of the misarticulations on social and academic achievement, do the children in School System A appear to have better adjustment to their misarticulation than do children in School System B as measured by the average ratings given by the teachers?
- 3. Do children with speech misarticulations at the Grade Six level have a higher score on the pupil questionnaire than do children who do not have speech misarticulations? When asked the question, "Have you ever had a speech difficulty?" h ow many children from each school system reply in the affirmative?
- 4. The null hypothesis was put forth that no difference exists between the correlations of the scores on the Pupil Questionnaire and the Articulation Test scores for the two school systems tested.

CONSTRUCTION OF THE PUPIL QUESTIONNAIRE

The pupil questionnaire was constructed by the investigator. It contains thirty questions about school and extra-curricular activities. Among these thirty questions are ten relating to speech ability and attitudes

toward speech. These ten questions were arbitrarily composed by this investigator and were each given an arbitrary numerical value.

The following questions concerned the child's participation in speaking situations and were scored with a zero for YES, a score of one for undecided, and a score of two for NO.

1. Do you like to give a report to your class?

- 19. Have you ever had a speaking part in a school or class play?
- 20. Have you ever been selected by your classmates to give a talk or a report?

25. Have you ever been told that you speak well?

The following questions asked for a definite opinion about the child¹s attitudes toward his own speech. They received a zero score for NO, a score of one for undecided, and a score of two for YES.

- 6. Do you ever have trouble pronouncing new words?
- 10. Have you ever had trouble saying certain sounds in words?
- 15. Have you ever had a speech difficulty?
- 22. Have you ever refused to answer a question because you were afraid you couldn't pronounce a word correctly?
- 26. Do you feel frightened when you get up in front of your class to make a talk or give a report?

30. Do you wish you could speak better than you do?

The highest possible score on this questionnaire was 20. This investigator assumed that the higher the score on the questionnaire the greater was the indication of poor speaking ability and/or strong negative feelings about speaking situations. In addition to a numerical value for each pupil questionnaire, each question was tabulated as being significant or non-significant on the master sheet. Significant scores were 2, non-significant scores were 1 or 0.

CONSTRUCTION OF THE ARTICULATION SCREENING TEST

The Individual Rating Sheet for the Articulation Screening Test is given in Appendix II. The instructions for this test are also listed in Appendix II.

A review of research revealed the consonant sounds other investigators discovered to be most frequently efective among school children.

Van Riper¹ found that the <u>s</u>, <u>z</u>, voiced and voiceless <u>th</u>, <u>r</u>, <u>zh</u>, <u>l</u>, <u>ch</u>, <u>sh</u>, <u>f</u> and <u>v</u> were the most common errors among school children. Hall² listed <u>s</u>, <u>z</u>, <u>sh</u>, <u>ch</u>, <u>j</u>, <u>zh</u>, <u>wh</u>, voiceless <u>th</u> and <u>r</u>. In his analysis of misarticulations in school children in Saskatoon, Grades One through Eight,

¹Van Riper, <u>loc. cit</u>.

²M. E. Hall, "Auditory Factors in Functional Articulatory Speech Defects," <u>J. Exc. Ed.</u>, 7:110-132, December, 1938. Coombs³ listed the <u>s</u>, <u>z</u>, voiceless <u>th</u>, <u>sh</u>, <u>r</u>, <u>j</u>, <u>ch</u>, <u>f</u>, <u>v</u>, <u>l</u>, <u>k</u> and <u>g</u> in decreasing order of difficulty. These most common errors in the speech of school children compare with the consonant sounds that are among the last to be assimilated through maturation.⁴

Spriestersbach and Curtis⁵ and Snow⁶ have reported inconsistencies in the articulation of speech sounds among school children. They point out that a sound may be articulated adequately in one word, but misarticulated in another word. Snow and Templin also investigated the effect of oral stimulation on the child's response. Templin found that there was little or no significant difference in the testing of consonants through picture test or through oral stimulation. Snow found that oral stimulation seemed to be affecting the responses of children by giving them the proper auditory pattern.

³Coombs, <u>loc</u>. <u>cit</u>.

⁴Poole, <u>loc</u>. <u>cit</u>.; Templin, <u>loc</u>. <u>cit</u>.; Wellman, <u>loc</u>. <u>cit</u>.; Wellman,

⁵Spriestersbach and Curtis, <u>loc. cit</u>.

⁶K. Snow, "A Detailed Analysis of Articulation Responses of "Normal" First Grade Children," <u>Jour. Speech</u> <u>and Hear. Res.</u>, 6:277-290, September, 1963; Templin, <u>loc</u>. <u>cit</u>.

A review of literature also discloses that articulation testing with young children has been done primarily through a picture test. If the child is old enough to read, he is given a list of sentences containing a number of words having the consonant to be tested, and the examiner records the response. In both picture tests and reading tests, the sound to be tested is usually elicited in the medial, final and initial positions.

This investigator chose twelve consonants for the articulation test in this study. The <u>sh</u>, <u>ch</u>, <u>f</u>, <u>l</u>, <u>s</u>, <u>z</u>, voiceless <u>th</u>, <u>v</u>, <u>j</u>, and <u>r</u> sounds were tested in the initial, medial and final positions; the voiced <u>th</u> in the initial and medial positions, and the <u>zh</u> in the medial position only. No blends were tested. All of the words used in the articulation test appear in the Thorndyke and Lorge basic 30,000 word vocabulary list.⁷ Each student was asked to make a short sentence using the words in the list. The examiner listened for the production of the consonant being tested, and scored this as being satisfactory,

⁷E. L. Thorndyke and I. Lorge, <u>The Teacher's Word</u> <u>Book of 30,000 Words</u> (New York: Columbia University Press, 1944).

distorted, omitted, or whether another sound was substituted. Following the pilot study, in which two observers listened to the speech of thirty-three children, the investigator decided to make a judgment on the test word only, although in conversation, with some of the pupils, it was noted that their responses on certain sounds were inconsistent.

On the Individual Rating Sheet, an adaption of a scale used by Simonsen⁸ was used. This investigator devised a scoring scale based on the order of development of sounds, that would give each sound a weighted score. Simonsen tested twenty-three sounds that were given arbitrary numbers from one to twenty-three. If a child misarticulated sounds usually acquired at an early developmental stage, his score was penalized more than if he misarticulated sounds usually acquired at a later age.

In this present study, the investigator gave the consonants an arbitrary, numerical rank that related closely to the studies reported earlier. This ranking was as follows:

⁸J. W. Simonsen, "The Relationship Between Intelligence and Certain Linguistic Abilities in the Elementary Grades" (unpublished Master's thesis, University of Wisconsin, Madison, 1939).

	<u>s</u>	-	1	voiced <u>th</u> - 5	<u>zh</u>	-	9
Toioo	r	-	3	<u>ch</u> - 7	л У		11
less	<u>th</u>	-	4	<u>sh</u> - 8	f		12

From this ranking, it will be seen that the lower the ranking, the more common the articulation error. For instance, there is common agreement, among the research reports quoted, that the s is the most commonly misarticulated consonant. This sound, then, carried a value of only 1. The $\underline{\mathbf{f}}$ sound, on the other hand, is seldom misarticulated by children at the intermediate level, and therefore it was assigned an arbitrary value of 12. If the sound was tested in only two positions, its numerical value was multiplied by two. If the sound, for instance <u>zh</u>, was tested in one position only, its numerical value was multiplied by If the sound was tested in three positions its one. numerical value was multiplied by three. The sum of the products of the numerical value of each letter and its frequency of testing was 211. A score of 211 meant that there were no errors in articulation as judged by this screening test.

In order to convert the scores to positive scores, the total number of errors on each test was added and then subtracted from 211.

CONSTRUCTION OF THE QUESTIONNAIRE FOR TEACHERS

The questionnaire to teachers of the Grade Six pupils is in Appendix II. This questionnaire described an articulation problem, and asked the teachers' cooperation in identifying the children in the class who had articulation difficulties. In addition, it asked for the specific sounds misarticulated. The teacher was also asked to give her opinion, on a one to five rating scale, of the effect of any child's articulation difficulty on his school work and on his social contacts.

This investigator asked the superintendents of the respective school systems to select a school, or schools, located in a middle-economic area, from which at least three hundred Grade Six children could be tested. All children, regardless of known physical handicap, emotional problems, or intellectual achievement were tested by this investigator. However, after checking with the nurses in the schools in School System B, and with the speech therapists in School System A, the test results of the following children were not used in this study: all children with known bi-lateral hearing losses of more than 20 decibels; all children known to be handicapped by cerebral palsy or cleft palate or cleft lip conditions; all children known to have had some paralysis of the oral

structures; and all children known to stutter. Because of absentees, either on the day of the examiner's visit to the school, or on the day the children answered the questionnaires, and because of the excluding conditions mentioned here, a total of only 276 children in each school system was eventually used in this study.

Although these children were selected according to total class enrolment, the number of males and females was similar as is seen by the following distribution:

>

16	Boys	<u>Girls</u>	<u>Total</u>
School System A	148	128	276
School System B	149	127	276
		*	552

PATERNAL STATUS

Previous investigations have been made into the possible relationship of socio-economic and economic positions and articulatory defects in children.⁹

The paternal occupation was obtained from each child interviewed and this information was scaled on the Minnesota Scale for Paternal Occupations. The following figures

⁹C. Weaver, Catherine Furbee, and R. Everhart, "Paternal Occupational Class and Articulatory Defects in Children," Jour. Speech and Hear. Dis., 25:171-175, May, 1960.

give the distribution of the paternal economic status for the children in the two school systems and suggests that the children used in this investigation came from similar economic backgrounds.

	Distribu 	ation on	for the	Pat Min	erna	l Ec ta S	onom	nic S [.]	tatus	
		1	2	3	4	5	6	7	Total	x
School	System A	10	43	68	25	91	32	7	276	3•97
School	System B	6	31	58	16	89	61	15	276	4.43

PREPARATION OF THE INFORMATION FOR ANALYSIS

The results of the screening test, the questionnaire, and the teachers[†] identification sheet were scored and entered on a master sheet that would be used for IBM processing. This master sheet is given in Appendix II.

The master sheet is largely self-explanatory, except for the Card Column 59. It was not possible to discover whether the children in School System B had had Speech Therapy in the past, so that this column would be blank for all children from School System B.

CHAPTER IV

ANALYSIS OF DATA

I. SPEECH ASSESSMENTS

A perfect score on the speech assessment was 211. The means of the scores on the speech assessments were found to be 208.565 for School System A (with speech therapy), and 205.47 for School System B (with speech consultative services only). The difference, 3.094, was found to have a critical ratio of 3.36. The formula:

 $t = \frac{\text{diff}}{\text{S.E. diff}}$ t = 3.36(at the 0.01 level, t = 2.326)
Where S.E. diff = $\sqrt{\frac{2}{Y_A} + \frac{2}{Y_B}}$ and Difference = 3.094
S.E. diff = 0.9209

That is, the difference between the mean scores, on the speech assessment, for the two school systems was found to be significant at the .Ol level of confidence. The null hypothesis, namely, "that children in a school system providing speech therapy when compared to children from another school system having no speech therapy, would not make higher scores on a speech test administered by the same tester"," was therefore rejected. In view of these findings, it can be said that pupils in Grade Six in the school system that provides speech therapy, when compared with the pupils at the same grade level in another school system that provides speech consultant services only have higher scores in "speech" as assessed by one examiner, with this particular instrument, at this time.

The speech assessment scores were analyzed on the basis of the median for the two school systems. The results were:

Median Score on Speech Assessment

School	System	A	male female	-	211 211	combined	211
School	System	В	male female	-	209 211	combined	210

II. TEACHER IDENTIFICATION OF CHILDREN WITH MISARTICULATIONS

The investigator found more children with one or more misarticulations in School System B than in School System A. The number of children identified by the teachers, however, was smaller in School System B than in School System A, as shown:

	Number Identified By Teachers	Investigator's Opinion of Number of Children with One or More Mis- articulations
School System A	11	68
School System B	3	119

Because of the small number of children reported by the teachers, statistical analysis of these data was not applied.

Table V, on the following page, presents data for all of the children identified by teachers as having misarticulations. This summary illustrates how the judgments of teachers relate to the investigator's assessments. On inspection of this table, it appears that teachers' identifications were closely related to the speech assessment scores. The mean score for the "identified" pupils was 201.21 which was 5.96 points below that (207.17) of the remainder of the group.

A test of significance was applied to these data, with the following results:

t = $\frac{\text{diff}}{\text{S.E. diff}}$ Where S.E. $\text{diff} = \sqrt{\frac{2}{Y_A} + \frac{2}{Y_B}}$ t = 2.432 where diff = 2.451 (at 0.01 level, t = 2.326) S.E. diff = 2.451

The mean score of the speech assessments of the children identified by Grade Six classroom teachers was significantly different from that of the remainder of the group at the 0.01 level of confidence. In view of these findings, one can say that the classroom teachers' judgments of misarticulations of Grade Six pupils were valid for the small number of children identified in this study.

TABLE	V
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PUPILS WITH MISARTICULATIONS REPORTED BY TEACHERS

Pupil no.	Sex S c r	bcore o questio haire	n n-	Speech assess- ment	Teachers ¹ Effect of Problem on	Evaluation of Articulation	Item 15 on questior	Speech ther-	Sounds Mis	articulate	d .	
Coher	1 0	· - · · · ·			School Work	Social Contact	naire					······································
<u>131.</u>	<u>n byst</u>	<u>, em A</u> 9		194	1	2	undec.		<u>th</u> (vl) ^{imf}	li		
155.	М	14		205	5	4	yes		<u>1</u> m			
156.	М	10		206	3	4	yes	yes	sť	<u>z</u> if		
157.	М	15		208	5	5	yes	yes	<u>s</u> Í	<u>z</u> ¹		
187.	\mathbf{F}	18		201	5	5	unde c.	yes	<u>z</u> i	$\underline{th}(v1)^{mf}$		·
219.	F	12		211	4	5	no					
229.	\mathbf{F}	12		209	2	1	yes	yes	_if 			
238.	М	18		207	2	2	yes		<u>th</u> (vd) ^m	sh		
239.	М	10		177	4	2	no	no	<u>s</u> im	imf 	<u>sh</u> imf	
251.	М	14		193	2	2	yes	yes	imf s	<u>z</u> imf	<u>th</u> (vl) ^f	<u>th</u> (vd) ^m
273.	М	12		211	l	2	no					
	Mea	in	x =	3.09	·	$\bar{x} = 3.09$			i	-1	4	
51.	\mathbf{F}	15		195	4	4	no		<u>s</u> ¹	<u>ch</u> ⁺ .	<u>sh</u>	
53.	F	7		197	l	l	yes		r ^m	th(vd)1	lm	
108.	F	3	_	203	2	_ 1	no		smi			
	Mea	in	x =	2.33		X = 2.00						
	Mea	in 12.	07	201.2	1							
	i - m - f -	initi media final	al 1									

59

NOTE: Evaluation made on a one to five rating scale.

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It is noteworthy that two of the pupils in School System A identified by teachers as having misarticulations were given a perfect score in the speech assessment by the investigator.

Teachers[†] estimates of the handicapping effect of the misarticulations on school work and on social contacts are also presented in Table V.

Generally speaking, teachers are "Undecided" as to whether or not the misarticulations affect school work. It is noteworthy that for three pupils in School System A, teachers felt that the misarticulations "Very Definitely" affected school progress.

In much the same way, teachers were "Undecided" about the effect of misarticulations on social contacts. Here again the ratings for three pupils in School System A were "Very Definitely" handicapping.

While, admittedly, the samples were small, there is some indication in the means of these ratings that the teachers in School System A considered that misarticulations had a somewhat greater handicapping effect on school work and on social contacts than did teachers in School System B.

III. PUPIL QUESTIONNAIRE

The Pupil Questionnaire (Appendix II) contained ten questions of self-judgment of speaking ability, and an expression of feelings about speaking situations. A maximum score of twenty, in the investigator's opinion, indicated that the pupil felt himself to be a poor speaker and probably did not participate in situations requiring good speaking ability.

The mean of the scores on the Pupil Questionnaire for pupils in School System A was 10.083, and for pupils in School System B, 10.533, with a difference of 0.45. This difference was not statistically significant.

The median scores for the Pupil Questionnaires were as follows:

Pupil Questionnaire Median Score

School	System	A	male female	-	10 10	combined	-	10
School	System	В	male female	-	10 11	combined	-	10

A further analysis of the Pupil Questionnaire results was made. The question was asked, "Do children with speech misarticulations at the Grade VI level have a higher mean score on the Pupil Questionnaire than do children who do not have speech misarticulations as measured by (1) the teachers[‡] judgments of misarticulations, and (2) the investigator[‡]s judgment of misarticulations?"

A partial analysis of the first question, based on teacher identifications, is shown in Table V. These pupils had a mean score of 12.07, as compared to the mean score (10.26) of the remaining pupils in both school systems. A test of significance was applied to these data:

 $t = \frac{diff}{S.E. Diff}$ t = 1.682Where Diff. = 1.81 S.E. Diff = 1.076

(At the 0.01 level of confidence, t = 2.326; at the 0.05 level of confidence, t = 1.645); therefore, t is significant at the 0.05 level of confidence, and not at the 0.01 level of confidence.

From this, then, one may conclude that the children identified by teachers as having misarticulations, made slightly higher scores on the Pupil Questionnaire than did the children who were not identified by the teachers as having misarticulations.

The mean score on the questionnaire of all children with one or more misarticulations, and the mean score on the Pupil Questionnaire of all children having a perfect score on the speech assessment were compared, and a test of significance of the difference between these mean scores was made. The results were:

t	=	<u>diff</u> S.E. Diff	Where S.E. diff	=√°	$x_A + x_B$
t.	E	1.18	and Diff	z	1.18
		0.38	S.E. Diff	=	0.38
t	= *	3.1026			
(A1	t th	ne 0.01 level,			

t = 2.326)

From this test of significance, it is seen that for the total group of children tested, those children having misarticulations tended to make higher scores on the Pupil Questionnaire than did the children having perfect scores on the assessment.

The scores were broken down into the categories set out in Table VI, and tests of significance were run with the results reported in the table. It can be seen from this table that the significance shown for the entire group is not present for all groups in School System A, nor is this significance present for any of the three groups in School System B. These findings suggest to the investigator that in a school system where speech therapy is provided, that the need to correct speech deviations may be more important to children, and that their awareness of these speech deviations is reflected in their answers to the

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TABLE VI

SHOWING RESULTS OF TESTS OF SIGNIFICANCE APPLIED TO MEAN SCORES ON PUPIL QUESTIONNAIRE FOR CHILDREN WITH ONE OR MORE MISARTICULATIONS AS OPPOSED TO THOSE WITH PERFECT SCORES ON THE SPEECH ASSESSMENT

	Differ- ence	S.E. Differ- ence	- t	
Total Group	1.179	0.38	3.1026	Significant at both 0.01 and 0.05 levels of confidence
School System A	1.82	0.65	2.8000	Significant at both 0.01 and 0.05 levels of confidence
School System B	0.616	0.502	1.227	Not significant
School System A - male	1.704	0.744	2.2903	Significant at 0.05 level of confidence but not at 0.01 level
School System A - female	2.131	1.475	1.447	Not significant
School System B - male	0.548	0.685	0.80	Not significant
School System B - female	0.898	0.753	1.1926	Not significant
(t at 0.01 lev	vel = 2.	326; t	at 0.05	level = 1.645).

questions on the Pupil Questionnaire. Also, in a school system where speech therapy is not provided, Grade Six children, with more misarticulations than were found in Grade Six children in the therapy setting, are either not aware of the speech deviations, or do not consider them important, and these attitudes are reflected in the answers to the questions regarding speech and speaking situations.

In addition to the above analysis, the answers to the questions were rated as "Significant", or "Nonsignificant", and the number of significant responses given by pupils in School System A and School System B, together with the total and the percentages, are presented in Table VII.

The differences between the percentages of children answering "Significantly" in the two school systems should be particularly noted in Questions 3, 6, 15 and 30. From these responses, more children in School System B (without therapy) felt that they had trouble pronouncing new words, felt that they had had a speech difficulty, and wished that they could speak better. Also, more children in School System B did not like to give a report to their class.

TAB	LE	VII

PERCENTAGE OF SIGNIFICANT RESPONSES TO QUESTIONS MADE BY PUPILS IN SCHOOL SYSTEMS A AND B

Ques	tion				Syst	em A				<i>y</i>	Syste	m B		
no.		Signi- ficant	Male no.	Per cent	Fe- male no.	Per cent	Total	Total per cent	Male no.	Per cent	Fe- male no.	Per cent	Total	Total per cent
3.	Do you like to give a report to your class?	no	60	40.5	48	37.8	108	39.13	76	51	. 63	49.5	139	50.36
6.	Do you ever have trouble pronouncing new words?	yes	82	55.4	65	50.7	147	53.26	88	59	86	67.8	17 ¹ +	63.04
10.	Have you ever had trouble saying certain sounds in words?	yes	74	50.0	52	40.6	126	45.65	79	53	63	49.6	142	51.45
15.	Have you ever had a speech difficulty?	yes	46	31	37	28.7	83	30.07	64	43	55	43.3	119	43.12
19.	Have you ever had a speaking part in a school or class play?	no	34	23	28	21.9	62	22.46	30	20.1	L 19	15.0	49	17.75
20.	Have you ever been selected by your class- mates to give a talk or report?	no	86	58.1	78	60.9	164	59.42	109	73•2	2 80	63.0	189	68.48
22.	Have you ever refused to answer a question because you were afraid you couldn ¹ t pronounce a word						•••							
	correctly?	yes	44	29.7	41	32.0	85	30.80	45	30.2	2 46	-36.2	91	32.97
25.	Have you ever been told you speak well?	no	85	57.4	73	57	168	60.87	95	63.8	3 66	52.0	161	58.33
30.	Do you wish you could speak better than you do	yes	86	58.1	62	48.4	148	53.62	103	69.1	L 82	64.6	185	67.03

IV. CORRELATIONS BETWEEN THE SCORES ON THE PUPIL QUESTIONNAIRE AND SCORES ON THE SPEECH ASSESSMENT

The correlations between the scores on the Pupil Questionnaire and the Speech Assessment for the two school systems were calculated by the formula:

$$r = \frac{N\Sigma_{xy} - \Sigma_{x} \Sigma_{y}}{\sqrt{[N\Sigma_{x}^{2} - (\Sigma_{x})^{2}][N\Sigma_{y}^{2} - (\Sigma_{y})^{2}]}}$$

For School System A, r = 0.201
For School System B, r = 0.182
0.019

A test of significance of the difference between the two correlation coefficients was then applied, using Fisher's z_r transformation,¹⁰ and the formula:

$$z = \frac{z_{r_1} - z_{r_2}}{\sqrt{\frac{1}{(N_1 - 3)} + \frac{1}{(N_2 - 3)}}}$$

z = 0.23

At the 1 per cent level of confidence z = 2.58At the five per cent level of confidence z = 1.96. Therefore, the difference of 0.019 was not found to be significant.

¹⁰George A. Ferguson, <u>Statistical Analysis in Psycho-</u> <u>logy and Education</u>, McGraw-Hill Series in Psychology (New York: McGraw-Hill, 1959), pp. 153-154. The investigator had put forth the null hypothesis that no difference existed between the correlations of the scores on the Pupil Questionnaire and the Articulation Test Scores for the two school systems tested.

According to Ferguson¹¹ because of the formula used:

 $H_0: l_1 - l_2 = 0$

we fail to reject the null hypothesis, but this does not mean that the null hypothesis is necessarily true.

An indefinitely large number of alternative hypotheses exist, in addition to the null hypothesis, which on the basis of any particular bit of experimental evidence cannot be rejected.12

This finding suggests that the relationship in one school system between the scores pupils made on the questionnaire and their speech assessment scores was not in any way different from the relationship between the two variables in the other school system.

V. CHILDREN WHO HAD RECEIVED SPEECH THERAPY

Under the organization of this study, it was not feasible to determine how many of the children from System B

¹¹Ferguson, <u>loc</u>. <u>cit</u>. ¹²<u>Ibid</u>., p. 133. had received speech therapy in the past. However, Table VIII shows the speech assessment scores of the children from School System A who had received therapy and their scores on the Pupil Questionnaires. It is seen that of these ten children, one child replied "No", and another, "Undecided", in answering the question, "Have you ever had a speech difficulty?"

It will be seen that the mean score (14.5) on the Pupil Questionnaire of this group having therapy is 3.19 points above the mean (10.308) for the entire group of pupils. The mean score on the speech assessment for this group was 203.8, or 3.22 points below the mean (207.02) for the entire group.

The types of misarticulations made by these children are mostly distortions, and occur in the most commonly defective sounds as reported in an earlier chapter, that is, <u>s</u>, <u>z</u>, voiced and voiceless <u>th</u>, and <u>r</u>, with only one <u>sh</u> distortion.

SUMMARY OF FINDINGS

The results of this study failed to support the null hypothesis that there were no significant differences between the mean speech articulation score of Grade Six children in a school system that provided speech therapy,

TABLE VIII

CHILDREN FROM SCHOOL SYSTEM \underline{A} KNOWN TO HAVE RECEIVED SPEECH THERAPY

No.	Sex	Score on Question- naire	Speech Assess- ment	Question 15*	Sounds Misarticulated
1	М	16	207	yes	$\underline{s}, \overset{\text{mf}}{\underline{z}} \underline{z}^{f}$, (distorted)
2	М	15	206	Undecided	<u>th</u> i(vd.), (Substitution)
3	М	16	202	no	r ^{imf} , sub. omit, omit.
4	F	14	209	yes	<u>s</u> ^{mf} , (distorted)
5	М	10	206	yes	$\underline{s}^{f}, \underline{z}^{fm}, (distorted)$
6	М	14	193	yes	$\underline{s}^{imf}, \underline{z}^{imf}$ (distorted)
					$\underline{th}^{f}(vd)$ substituted, \underline{th}^{m} (vl.)sub
7	М	15	208	yes	$\underline{s}^{f}, \underline{z}^{f}$ (distorted)
8	F	18	201	yes	\underline{z}^{i} , (sub.) $\underline{th}^{mf}(vl.)$ omitted
9	М	14	205	yes	$\underline{s}^{mf}, \underline{z}^{mf}, (distorted)$
LO	М	13	201	yes	$\underline{z}^{\mathtt{m}}, \underline{sh}^{\mathtt{f}}$ (distorted)
Mean		14.5	203.8		
Mean gr	for e oup	ntire 10.308	207.018	3	
*Que	stion	15: Have yo	u ever had	l a speech diff	ficulty?
(i -	initi	al position;	m - medi	lal position;	f - final position)

and the mean speech articulation score of Grade Six children in a school system that provided speech consultant services only, as measured by a particular instrument, at a particular time, by the same tester.

No differences were found between the mean scores of the responses to the Pupil Questionnaire for the two school systems.

More teachers from School System A (providing therapy) identified children with speech misarticulations than did teachers in the school system having speech consultant services. On the whole, these identifications compared favourably to the investigator's judgments.

Pupils who had received speech therapy in School System A made more errors on the speech assessment and had higher scores on the Pupil Questionnaire than did the remaining pupils in both school systems.

In evaluating the groups as a whole, pupils with misarticulations scored statistically higher on the Pupil Questionnaire than did those pupils with no misarticulations. Although this same relationship was not reflected in the scores of the pupils with misarticulations in School System B, it was shown to be present in the scores of the pupils with misarticulations in School System A. The results of a test of significance on the correlations of the scores on the Pupil Questionnaire and the Speech Assessment for the two school systems suggests that the relationships between these two variables was not in any way different in the two school systems.

CHAPTER V

CONCLUSIONS, OBSERVATIONS AND RECOMMENDATIONS

I. REVIEW OF EXPERIMENTAL DESIGN

This study was designed to compare quantitatively the speech misarticulations of Grade Six children in two Canadian school systems. Two hundred and seventy-six children from each school system were used in the final analysis of the data. One school system, A, had provided speech therapy for the previous ten years; the other school system, B, had provided speech consultant's services for the previous three years. The speech assessments were made by one examiner. This study was also designed to investigate the self-judgment of speaking ability and feelings about speaking situations of the children tested. In addition, the study compared the results of classroom teachers' judgments of articulation with the judgments of the investigator, who is a trained speech therapist.

II. CONCLUSIONS

In the analysis of data, a statistically significant difference was found between the mean scores on the Speech Assessment of the Grade Six children in the two school systems; the children in the school system providing therapy had a mean score higher than the mean score of the children in the other school system. Under the organization of this study, more detailed analysis of the background of each Grade Six child was not made. Therefore, one cannot conclude that the scores on the articulation test were better because of the inclusion of speech therapy in the public school programme. In School System A, only ten children used in this study had actually received speech therapy, but an additional nine had been tested by the speech therapists. However, the two groups of children from the two different school systems were closely matched with respect to sex, paternal economic status, and grade placement.

No statistically significant difference was found between the responses of the pupils of the two school systems to the Pupil Questionnaire. However, an inspection of the percentages of children giving "Significant" responses to four specific questions revealed a slight tendency for the children from School System B to feel less adequate about their speaking ability.

The findings of this study indicate that teachers in a school system with speech therapy are more aware of speech deviations and that their judgments are usually comparable to those of a trained speech therapist, as judged by a small sampling. It was not possible to compare

the two school systems in the efficacy of teacher identification of speech difficulties, because of the small number (only three) identified by teachers in School System B.

In considering all students from both school systems, it was found that students having perfect scores on the speech assessment test had a mean score on the Pupil Questionnaire which was significantly lower than the mean score on the questionnaire of students making one or more misarticulations on the speech assessment. However, in breaking down this analysis into school systems, it was found that there was not a significant relationship between the mean questionnaire scores in the school system with no therapy. Nor was there a relationship between the mean scores of the Male and Female Group in School System B. However, of School System A, Total Group, and Male Group, those students achieving a perfect score on the speech assessment had a significantly lower mean score on the Questionnaire than the mean score on the Questionnaire of those students making one or more errors on the speech assessment. The difference was not found to be statistically significant between the mean questionnaire scores of School System A, Females, although the actual difference, 2.131, between the mean scores was greater than for any other group, including those for whom the difference was

found to be statistically significant. This is most probably due to the small number (15) of females in School System A making one or more misarticulations on the speech assessment, which resulted in a relatively high standard error of the difference between the mean scores on the questionnaire for the females of School System B.

The investigator suggests that these differences in the two groups tested from the two school systems may be explained by any of the following factors or combination of factors:

- 1. That children in a school system providing speech therapy have better scores on an articulation test at the Grade Six level because of the classroom teachers[‡] awareness of speech difficulties and the fact that the speech therapists provide guidance and encouragement in stimulating better speech through classroom activities.
- 2. That Grade Six children in a school system providing speech therapy are more aware of good speech standards, and therefore feel more concerned about achieving better speech. On the contrary, children in a school system with no speech therapy may not be aware of their speech deviations, and therefore do not show concern about their speech standards.

- 3. That a speech therapy programme in the public schools does improve speech standards by reducing the number of misarticulations among Grade Six children, but that not all children having received therapy have achieved a "perfect" score on the speech assessment. The types of speech deviations remaining, despite therapy, are recognized as being among the most difficult to correct.
- 4. That the statistical difference between the mean scores on the articulation assessment of the pupils in the two school systems may be the result of other factors, and that a repetition of this study carried out in two school systems with speech therapy, or two school systems without speech therapy, might produce results similar to those of this present study.

III. OBSERVATIONS

Limitations of this study have been mentioned in a previous section. However, further acknowledgment of the restrictions of the methodology should be made. The analysis of the speech assessment data did not make use of the classification of substitutions, distortions, or omissions as a means of describing the types of speech deviations. Such information would have been worthwhile, although this was not the main purpose of this investigation.

The screening device used did not ask for further investigation of related areas such as bi-lingualism, examination of the structure and function of the oral mechanism, auditory discrimination abilities, or emotional problems. The assumption in using this restricted screening device is questionable, but the differences in the two school populations are statistically significant under the criteria used.

Further limitations of this study were present in the use of the Pupil Questionnaire. No attempt was made to standardize the questions. However, as the groups were comparable with respect to age, grade placement, and economic status, the investigator felt that these questions did, to some extent, test valid feelings about speech and speaking ability, recognizing the limitations of any questionnaire given at a particular time to a particular group of children. Many teachers indicated interest in the way their pupils answered the questionnaires, . One principal suggested that this was, perhaps, the most important area of the study.

One of the secondary findings of this study was the fact that so many of the twelve school boards responding to the Questionnaire showed great interest in the study, and many of them sent Annual Reports or special

reports to enrich this investigator's approach to a study of speech problems in the public schools throughout Canada. Some school systems indicated that they had created speech therapy positions, but could not find qualified personnel to fill the positions.

Although School System A maintained a staff of nine speech therapists during the year of this investigation, the administrative details of the speech therapy programme did not include weekly visits to each school each year. One of the schools in which the testing took place provided over one hundred Grade Six children for this study, but this school was not visited regularly by the speech therapist during the year of the investigation. It was interesting to note that in this school, two of the Grade Six teachers were new to the system, and they did not report any children with misarticulations.

The investigator also recognizes the limitations of this study related to a lack of information about possible speech therapy that may have been received by the pupils in School System B.

IV. RECOMMENDATIONS

The investigator recommends that the data accumulated from this research be further analyzed by any researcher under the following criteria:

- 1. What sounds were most commonly misarticulated at the Grade Six level, and what type of errors were made?
- 2. Pupils tested in this study should be given a standardized personality inventory to ascertain the relationship of their responses to the questions posed in the present investigation.
- 3. That information on pupils from School System B be obtained to ascertain whether or not they had received speech therapy previously.

It is also recommended that the same procedure and testing material be used to test Grade Six children from two other Canadian cities providing speech therapy, and two other Canadian cities that do not provide speech therapy.

In conclusion, the investigator would strongly recommend that the role of the classroom teacher in helping children with speech problems be studied in the areas of elementary school curriculum, courses available in teacher training institutions, and the usefulness of speech therapy or speech consultant services in the public schools.

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APPENDIX I

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Copy of Letter Sent to Twelve School Boards

Dear Sir:

As a part of my research project nearing completion at the University of British Columbia, I would appreciate your cooperation in answering the following questions concerning your public school programme for the speech handicapped child.

- 2. What percentage of your school population do you estimate have speech and hearing problems that should receive therapy?
- 3. What is your total school enrolment during the 1963-64 school year?

Elementary _____ Secondary _____

for nour kindnoss in answering th

Thank you for your kindness in answering these questions. Your reply will be most useful in helping me to bring my facts up to date on speech and hearing therapy services in the public schools in Canada.

Sincerely yours,

(Mrs.) "Elaine S. Clemons"

Copy of Letter Sent to Principals of Schools Participating in This Study

The Superintendent of the Public Schools, has kindly given me permission to approach you regarding the possibility of your school's participation in a research project on speech difficulties.

In brief, this study will screen, by means of a speech articulation test, three hundred grade six children in two Canadian school systems. These same children will be asked to complete a short questionnaire that includes specific questions concerning their speaking ability. The home room teachers of these children will be asked to give their judgments of the number of children having speech misarticulations. It is hoped that the results of this study will provide worthwhile information for Canadian educators in planning for children with speech difficulties.

As a result of a pilot study conducted in the schools, I found that the following procedure facilitated my investigations and brought about fewer disruptions to the classroom activities.

- 1. About a week previous to my visit to the school, the home room teachers administered a short questionnaire to all grade six pupils. The time required for this part of the study did not exceed fifteen minutes of class time. (See attached questionnaire.)
- 2. Each home room teacher was asked to list the children in her room who had speech misarticulations. (See attached.)
- 3. On the day of the examiner's arrival at the school, each grade six pupil was screened by means of a short articulation test. The actual machinery for this screening indicated that no child need be absent from his classroom for more than ten minutes. The testing in each room began with two children being sent to the testing room. As soon as the first child had been screened, he returned to the classroom and sent the third child to the testing room. The second child sent the fourth child, and soom and in this manner disruption of classroom activities was kept to a minimum.

I would greatly appreciate it if you would discuss this proposal with your grade six teachers, and notify the Superintendent's office if you agree to participate in this study.

> Sincerely yours, "Elaine Clemons"

Division _____

School _____

Dear_____

A research project on speech difficulties has been planned. We would greatly appreciate your help in carrying out this study. Will you please answer the following questions concerning certain children in your class? Thank you for your cooperation.

An articulation difficulty in speech is said to occur when a child omits, distorts, or substitutes one consonant for another. That is, a child may say "hou--" for "hou<u>se</u>" (omission), or he may have a "mushy" s or sh should when he says words like "<u>sun</u>" or "<u>sh</u>oe" (distortion), or he may say "<u>Thaturday</u>" for "Saturday".

Will you please list the name of each child in your room who has, <u>in your opinion</u>, any difficulty in articulating a sound or sounds? If possible, try to list the sounds he is having trouble articulating, and answer the questions concerning each child.

* * *

Child's name _____

Sound or sounds _____

In the two following questions, please circle the response that best fits your opinion.

- 1. Is this child's school work affected by his articulation difficulty?
 - a. Definitely not b. Probably not c. Undecided
 - d. Possibly e. Very definitely
- 2. Are this child's social contacts affected by his articulation difficulty?
 - a. Definitely not
 b. Probably not
 c. Undecided
 e. Very definitely
 * * *

Child's name _____

Sound or sounds _____

In the two following questions, please circle the response that best fits your opinion.

- 1. Is this child's school work affected by his articulation difficulty?
 - a. Definitely not b. Probably not c. Undecided
 - d. Possibly e. Very definitely

- 2. Are this child's social contacts affected by his articulation difficulty?
 - a. Definitely not
 b. Probably not
 c. Undecided
 d. Possibly
 e. Very definitely

(If there are other names to be added, ask your Principal for additional forms.)

APPENDIX II

.

Pup	il's name	Division	School			<u></u>
and man UND	The following questions are ask activitics. They DO NOT have a right y questions as possible. If you reall ECIDED.	ed to find or or a wrong y cannot mak	ut how YOU feel answer. Please e up your mind,	about circle circle	certa YES the 1	in subjects or NO to as word
l.	Do you like arithmetic?			Yes	No	Undecided
2.	Fo you like to play baseball?			Yes	No	Undecided
3.	Do you like to give a report to your	class?		Yes	No	Undecided
4.	Do you have any difficulty in spellin	g?		Yes	No	Undecided
5.	Do you feel that your writing is abou	t average or	better?	Yes	No	Undecided
6.	Do you ever have trouble pronouncing	new words?		Yes	No	Undecided
7.	Do you usually watch television every	day?		Yes	No	Undecided
8.	Do you enjoy your art classes?			Yes	No	Undecided
9.	Do you ever draw or paint pictures at	home?		Yes	No	Undecided
10.	Have you ever had trouble saying cert	ain sounds i	n words?	Yes	No	Undecided
11.	Have you ever been to a summer camp?			Yes	No	Undecided
12.	Do you think reading is one of your b	est subjects	?	Yes	No	Undecided
13.	Do you think you do well in Social St	udies?		Yes	No	Undecided
14.	Do you read as many as ten library bo	oks each yea:	r?	Yes	No	Undecided
15.	Have you ever had a speech difficulty	?		Yes	No	Undecided
16.	Do you want to finish High School?			Yes	No	Undecided
17.	Do you like to listen to classical mu	sic?		Yes	No	Undecided
18.	Do you enjoy watching Western T.V. sh	ows?		Yes	No	Undecided
19.	Have you ever had a speaking part in	a school or	class play?	Yes	No	Undecided
20.	Have you ever been selected by your c	lassmates to	give a talk	Yas	No	Undecided
21.	or report? Do you wish you could improve in spor	ts?		Yes	No	Undecided
22.	Have you ever refused to answer a que afraid you couldn't pronounce a word	stion becaus correctly?	e you were	Yes	No	Undecided
23.	Have you ever been selected as captai	n or manager	of a team?	Yes	No	Undecided
24.	Have you ever won a prize in music or	art?		Yes	No	Undecided
25.	Have you ever been told you speak wel	1?		Yes	No	Undecided
26.	Do you feel frighten ed when you get u class to make a talk or give a report	p in front o ?	f your	Yes	No	Undecided
27.	Do you take music lessons outside of	school hours	2	Yes	No	Undecided
28.	Do you take ice skating lessons?			Yes	No	Undecided
29.	Do you wish you could be a better spe	ller?		Yes	No	Undecided

30. Do you wish you could speak better than you do?

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Yes

No

Undecided

On this page you will see a list of common words. Look at these words carefully. If there is a word you do not know, please ask for help. When you have looked at all of the words, begin with the first word in the list and make a short sentence using the word. For instance: "I brush my teeth every morning". Then go on to the next work and make another sentence. Continue until you have made a sentence with every word in the list.

1.	brush	12.	vase	23.	jam
2.	sheep	13.	that one	24.	tire
3.	chair	14.	mouth	25.	zebra
4.	fire	15.	match	26.	rabbit
5.	ladder	16.	dress	27.	bottle
6.	basket	17.	brother	28.	bathtub
7.	thimble	18.	saw	29.	butterfly
8.	knife	19.	music	30.	seven
9.	barrel	20.	pillow	31.	five
10.	engine	21.	cage	32.	kitchen
11.	measure	22.	ears	33•	dishes

INDIVIDUAL RATING SHEET

Date	Child's	s name						
Binthdoto	CityDivision							
Did teacher	teacher report child? Yes No Give rating							
Does child	report difficulty with	ith speech?		·6				
	· · ·			, , , , , , , , , , , , , , , , , , ,				
Consonant	Initial Position	Medial Position	Final Position	Numerical Rank				
S			4 B	1 x =				
2.				2 x =				
r				3 x =				
th (vl.)				д х <u> </u>				
th		·····	ч. — — — — — — — — — — — — — — — — — — —	5 x =				
1				6 x =				
ch				7 x =				
sh				8 x =				
zh				9 x =				
j				10 x =				
v				ll x *				
f				12 x =				
Scoring: (- ((di	Score = 21) omission) sound substitut s.) distorted	=	Tota	1				
Does medical in the final	. report indicate co . analysis? Yes	ondition that migh	t exclude this c	hild's score				
Condition								
Has child ha	d speech therapy?	Yes No						
		Individual	Group					
For what per	iod of time?							
At what age?								

	Card Column	
Pupil #	1 - 3	
Sex	4	Male Female
Father's Occupation	5	1 2 3 4 5 6 7
Pupil Questionnaire	6 - 7	
Response Question 3 6 10 15 19 20 22 25 26 30	8 9 10 11 12 13 14 15 16 17	Sig. 1 2 Not
Teacher Opinion Effect on School Work	18	1 2 3 4 5
Effect on Social Adjustm	nen t 1 9	
Did Teacher Report	20	Yes No
Assessment - Mrs. Clemons	21 - 22	
Rating Sheet	2 3 - 58	
Has the Child had Speech Therapy	59	Yes No

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