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A Study of the Relationship Between Defects of articulation in Speech and Emotional Stability of children in the Primary Grades

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A STUDY OF THE RELATIONSHIP
BETWEEN DEFECTS OF ARTICULATION IN SPEECH AND
EMOTIONAL STABILITY OF CHILDREN IN THE PRIMARY GRADES

A Thesis
Presented to
the Graduate Faculty
Central Washington College of Education

In Partial Fulfillment
of the Requirements for the Degree
Master of Education

by
Frances P. Oechsner
August 1957

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This thesis is dedicated to F. and J., who, on the basis of random sampling, are highly improbable.

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CHAPTER I

INTRODUCTION

This study is concerned with the relationship between defects of articulation in speech and emotional instability in elementary school children.

The question of the extent to which these two factors are associated is of considerable interest to those working in the field of speech rehabilitation for two reasons: First, many writers have mentioned emotional instability as a frequent cause of articulatory defects, yet little has been reported in the way of objective data to substantiate such assertions. Secondly, if emotional instability is commonly found in speech defective elementary school children, it may well be that such emotional instability is the result of, if not the cause of, the speech defect. In either case, a clearer understanding of the emotional status of children with articulatory defects is desirable and it is hoped this study may make some contribution to this end.

The general procedure followed throughout the study involved a comparison of children having articulatory defects with speech normal children for personal and social adjustment. The parallel-group technique was

used, having the speech defect as a variable, with personal and social adjustment as the factors to be measured. In addition, an attempt was made to evaluate the attitudes toward speech in both the experimental and control groups.

The specific questions to which answers were sought may be stated as follows:

1. Is there a marked difference in emotional stability in a group of children having articulatory defects as compared with a control group of the same general intelligence, sex, and other ancillary factors?
2. Is there a marked difference in attitude toward speech in a group of speech defective children compared with a control group?

CHAPTER II

CRITICAL REVIEW OF PREVIOUS INVESTIGATIONS

Before proceeding to a discussion of the related historical data and the literature involved, it will be necessary to define articulatory defects and to explore the incidence of such defects. Articulatory disorders consist primarily of abnormal substitution, distortion, insertion, or omission of speech sounds. Vivian I. Roe, in studying the effect of maturation upon defective articulation in the elementary grades, found sound substitutions to be the most frequently observed error among articulatory speech defectives.¹ Articulation cases present a wide variety of symptoms and may range in severity from an intermittent lisp to a multitude of defective consonants. Where there is no demonstrable structural or constitutional deficiency, the defect is said to be functional. James F. Bender and Victor M. Kleinfield found that nearly 90 per cent of the speech handicaps encountered in the educational system were of

¹Vivian I. Roe, "The Effect of Maturation Upon Defective Articulation in the Elementary Grades," (unpublished Master's thesis, The University of Indiana, Bloomington, 1940), p. 46.

the bad habit or functional type.²

Speech therapists who have worked with children in elementary schools agree that articulatory defects are the most prevalent type of speech defect. The rehabilitation program requires considerable effort, and also absorbs a large share of the funds being appropriated for special education. This opinion is substantiated by the report of the White House Conference on Child Health and Protection of 1930, which estimated that articulatory defects comprise approximately 70 per cent of all speech defects of elementary school children.³

A review of the literature pertinent to this study involves (a) a discussion of the opinions of various writers as to the role of emotional instability as a causal factor in articulatory defects and (b) a review of other studies concerned with the relationship between articulatory defects and emotional instability.

A. Emotional Instability as a Causal Factor in Articulatory Defects

²James F. Bender and Victor M. Kleinfield, Principles and Practices of Speech Correction (New York: Pitman Publishing Company, 1938), p. 233.

³White House Conference on Child Health and Protection, Special Education, Report of Committee on Special Classes (New York: D. Appleton-Century Company, 1932), pp. 107-109.

The commonly mentioned causes of articulatory defects, according to Charles Van Riper, a representative authority in the field of speech correction, may be discussed in terms of organic abnormalities, motor incoordinations, developmental retardation, perceptual deficiencies, and emotional conflicts.⁴

As illustrated by the quotations that follow, the term "emotional conflicts" is identified in literature by several terms: emotional instability, personality inadequacy, social maladjustment, or "chance conditioning"; but for the purposes of this paper the popular term, "emotional instability," will be used.

The general acceptance of emotional instability as a possible major syndrome in articulatory defects is evident in the following excerpts from recognized authorities in the field of speech rehabilitation.

Ollie L. Backus, using the term "chance conditioning," discusses emotional instability as a cause of articulatory disorders:

It may well be a 'catch-all' for cases whose cause we do not know or do not take the trouble to find. However, there are at the present time, at least, many so-called minor articulatory defects which can be explained only by the term 'chance conditioning.' Why,

⁴Charles Van Riper, Speech Correction, Principles and Methods (New York: Prentice-Hall, Inc., 1947), p. 127.

for instance, should a child whose speech is otherwise normal and whose anatomical, psychological, and neurological mechanism is apparently sound, have a lateral lisp on s and ʃ? It seems necessary to predicate the factor of chance conditioning as one of the causes of articulatory defects.⁵

Van Riper states that

Emotional conflicts may . . . serve as predisposing, precipitating, and maintaining causes of speech disorders. The literature is thronged with case studies showing the influence of personality and behavior problems in producing speech disorders. . . . Some of our most difficult articulation cases are those in which the child has failed to acquire adult pronunciation because of emotional conflicts.⁶

Mildred F. Berry and Jon Eisenson, using the term personality, emphasize the same general concept:

The role which the development of personality plays in speech is well known. Speech is so intimately connected with our personalities that any major deviation from the norm in personal adjustment is certain to be reflected in speech.⁷

Bender and Kleinfield recognize the influence of emotional instability on speech, for they consistently emphasize that speech correction should include a consideration of such matters as mental hygiene and personality

⁵Ollie L. Backus, Speech Education, A Guide for the Classroom Teacher (New York: Longmans, Green, and Company, 1953), pp. 136-137.

⁶Van Riper, op. cit., pp. 31 and 133.

⁷Mildred F. Berry and Jon Eisenson, The Defective in Speech (New York: F. S. Crofts and Company, 1955), p. 75.

development. "Speech re-education includes self-analytical treatment to find immediately underlying mental causes of personality maladjustment and speech failure."⁸ The authors, furthermore, state that five to seven per cent of students in the public schools are neurotic and that this percentage is often exceeded in a group of speech handicapped children.

A neurotic person is one who lacks emotional stability, is too easily aroused, whose behavior is controlled with difficulty; for example, compensation tendencies, exaggerated egotism, introversion, ambiversion, extroversion, worry, anxiety, vexation, negativism, and mental conflicts are evident.⁹

Robert West, Lou Kennedy and Anna Carr feel there are many speech disorders, the explanation for which lies in the realm of abnormal psychology, psychopathology, or psychiatry. These disorders, which may be vocal, articulatory, or linguistic, are almost always rooted in childhood experiences and attitudes. Anything that causes the child to feel insecure in his social environment might establish emotional habits that could easily persist into adulthood. Some of the most common conditions are physical inferiority, peculiarities of appearance, peculiarities of dress and apparel, peculiar habits, mannerisms and

⁸Bender and Kleinfield, op. cit., p. 88.

⁹Ibid., p. 212.

afflictions, inferior social standing, unusual home discipline, and inferiority feelings. They believe the unique nature of speech defects, both in special type and particular incidence, demands the study of the individual.¹⁰ Therefore, the speech defective may need as much attention as the speech defect.

Backus believes speech is a gauge -- it is a test of the psychic adjustment of the individual to the conditions under which he must live. She stresses the fact that

. . .speech disorders and social maladjustment may have a common cause . . . social maladjustments may cause defective speech. Certain patterns of speech result rather habitually from social maladjustment. Yet, no causal relationship may exist between speech defects and social maladjustment. It is quite possible the speech defect and the personality problem seem to be present in an individual and yet have no causal relationship whatsoever.¹¹

To the above few excerpts could be added many more, for it is generally conceived that a child learns speech as a part of the whole process of organizing his behavior and learning to adjust to his environment. It is obvious,

¹⁰Robert West, Lou Kennedy, and Anna Carr, Rehabilitation of Speech, a Textbook of Diagnostic and Corrective Procedures (New York: Harper and Brothers; Revised Edition, 1947), pp. 38-52.

¹¹Backus, op. cit., pp. 115-119.

then, that a study of the various speech defects and disorders in children will perforce carry one into the field of personality study and behavior problems.

Logical and reasonable as these opinions of authorities seem to be in suggesting emotional instability as a causal factor in articulatory defects, the next step becomes one of determining whether this causal factor is supported by any experimental evidence. To further establish a background, the discussion will continue to research which has been completed, to determine whether the child with articulatory disorders differs significantly in emotional stability from the normal child.

B. Reviews of Studies on the Relationship Between Articulatory Defects and Emotional Instability

Although a number of studies have been made on certain aspects of the relationship between articulatory defects and emotional instability, Berry and Eisenson in 1955 suggested the need for further research:

In order to properly determine the influence of speech defects on the personality of an individual, we should deal with persons whose defects are purely and wholly functional in origin, defects which as far as we can discern have no organic basis and no organic correlates.

Unfortunately, except in the case of stutterers, there is little experimental evidence of any sort that touches on the possible influence of speech

defects on personality and the experimental evidence which is available has not taken cognizance of the possible concomitants we have mentioned. For the most part, mature persons, usually students at college level, have been the subjects of experimentation. Such subjects constitute a highly selected group and should not be considered representative of the speech defective population as a whole.¹²

Among the earlier studies mentioned by Berry and Eisenson of the personality traits of speech defectives were those of Sara Stinchfield,¹³ A. M. Templin,¹⁴ W. E. Moore,¹⁵ and Jon Eisenson.¹⁶

Stinchfield, in 1930, administered the Thurstone Personality Schedule to forty-six speech defective freshmen at Mount Holyoke College. Sixty per cent of the questions considered most significant by Thurstone as being indicative of maladjustment appeared in the positive list of high frequency answers.

In 1946, to substantiate the earlier findings,

¹²Berry and Eisenson, op. cit., p. 65.

¹³Sara M. Stinchfield, Speech Disorders (New York: Harcourt, Brace and Company, 1953), pp. 207-221.

¹⁴M. A. Templin, "A Study of Aggressiveness in Normal and Defective Speaking College Students," Journal of Speech Disorders, March, 1948, pp. 43-49.

¹⁵W. E. Moore, "Personality Traits and Voice Quality Deficiencies," Journal of Speech Disorders, March, 1949, pp. 33-36.

¹⁶Berry and Eisenson, op. cit., pp. 65-69.

Stinchfield arranged a Trait Inventory with forty-six desirable and undesirable traits to give to three groups of students at Mount Holyoke College. One group of students needed speech correction work, a second group of students were classed as having superior speech, and a large group of students with average speech ability. The group needing correction checked more negative traits than the other two on questions regarding disposition, tact, courtesy, control of behavior, and undue sensitivity. The speech correction group indicated by their scores they considered themselves below the average and superior group in such traits as evenness of disposition, courtesy, quietness, good memory, behavior control, and degree of sensitivity. In addition, the speech correction group considered themselves more aggressive than the other students.¹⁷

M. A. Templin used the revised Moore-Gilliland test to measure the single trait of aggressiveness with seventy-one students enrolled in the Speech Clinic at Purdue University and forty-nine normal subjects.¹⁸ Her results, while not statistically significant because of the small

¹⁷Stinchfield, op. cit., pp. 65-69.

¹⁸Templin, op. cit., pp. 43-49.

differences reported and too few subjects, tend to show that normal speakers were more aggressive than the speech defectives; and of the speech defectives, that the stutterers were more aggressive than the students with articulatory defects.

W. E. Moore, in 1948, administered the Bernreuter Personality Inventory to 119 students at Colorado State College and Kent State University who had voice quality deficiencies to find that students with breathy voices were likely to be high in neurotic tendencies and introversion, while those with a whine rated as probably emotionally unstable and lower in dominance. The students with harsh metallic voices were inclined to be dominant and more emotionally stable.¹⁹

In 1940, Eisenson sought to find whether the traits of college speech defectives, as measured by a standardized personality inventory, differ from those of normal college students and whether the personality traits of the speech defectives attending a clinic differ from those of the classroom speech defectives. Using again the Bernreuter Personality Inventory, he found (1) the clinic group slightly more neurotic than the class speech defective

¹⁹Moore, op. cit., pp. 33-36.

group and the normal group, (2) both defective groups were less self-sufficient than the control group, (3) the clinic group was more introverted than the class speech defectives and both were more introverted than the normal group, (4) the normal speakers were more dominant than either the clinic or the class speech defectives, and (5) the clinic group was less self-confident than the class speech defectives and the latter group more self-conscious (less self-confident) than the control group. There were, however, no appreciable differences in sociability among the groups considered.²⁰

From the above studies, the following results indicate: (1) the personality traits of college speech defectives are different, slightly and undesirably so, from college students with normal speech, (2) the differences in personality traits which appear between mild speech defectives and normal speakers are more serious when clinic students are compared with normal speakers. Thus, there seems to be a positive relationship between the seriousness of the speech deficiency and the tendency for the defective individual to possess undesirable personality traits. There seems to be a tendency for speech defective

²⁰Berry and Eisenson, op. cit., pp. 67-68.

individuals of college age to present a personality picture which includes traits considered to be socially undesirable.

But, in seeking to ascertain whether the speech defective child in the primary grades of elementary school differs significantly from the normal child in personality traits or emotional stability, one finds the research limited.

Numerous discussions of the relationship between speech disorders and personality defects in children are to be found in periodicals and recent texts. The factors of age, emotion, environment, thinking difficulties, anti-social trends, economic status, parental coddling, and parental anxiety have all been mentioned as related to the retardation of speech. But the majority of these opinions, as found in the periodicals and texts, lack the support of reported empirical research and statistical data.

Quintilla Anders, in 1945, made a study of the personal and social adjustment of children with functional articulatory defects. Using fifty-three children ranging from six to twelve years of age, she obtained a speech score, a mental age score, a teacher's rating, and a personality score with the California Test of Personality.

The subjects were found to be above average in adjustment, the median of test scores being 75 and the mean 65.64.²¹

Insofar as her study is concerned, speech correction for functional articulatory defects cannot be justified on the basis of preventing inevitable personality maladjustments.

Sister Mary Rose Powers used the same test to compare a group of one hundred junior high school stutterers matched according to sex, age, and intelligence with one hundred junior high school non-stutterers. In self-adjustment, no significant difference in the two groups was found; in social adjustment a tendency toward a significant difference was noted; and in total adjustment no difference was indicated. She concluded that both groups may be considered equally well adjusted.²²

Kenneth S. Woods, in 1946, sought to determine whether articulatory defects of children were definitely and significantly associated with maladjustment and undesirable traits (determined by interviews and questionnaires) of the parents. In completing his study, he

²¹ Quintilla M. Anders, "A Study of the Personal and Social Adjustment of Children with Functional Articulatory Defects" (unpublished PhM thesis, University of Wisconsin, Madison, 1945), pp. 18-54.

²² Sister Mary Rose Powers, "Personality Traits of Junior High School Stutterers as Measured by the California Test of Personality" (unpublished Master's thesis, the University of Illinois, Urbana, 1944), pp. 45-62.

administered the California Test of Personality to a group of speech defective children. The children's scores were widely scattered for all three sections of the test and his were not considered significant in showing maladjustment among the children. Therefore, he concluded that the speech defective children did not differ significantly from test norms on the California Test of Personality.²³

C. Summary and Discussion

In final analysis of the preceding discussion, the following conclusions may be formulated:

1. Articulatory defects are estimated to comprise at least seventy per cent of the total cases of defective speech.
2. Such defects may be considered to consist of abnormal substitutions, distortions, insertions, or omission of the speech sounds.
3. The causes of articulatory defects are discussed in terms of organic abnormalities, motor incoordinations, developmental retardation, perceptual deficiencies, and emotional instabilities.

²³Kenneth S. Wood, "Parental Maladjustment and Functional Articulatory Defects in Children," Journal of Speech Disorders, VII, December, 1946, 4, pp. 255-275.

4. The majority of authors consider emotional instability a causal factor in articulatory defects, especially functional articulatory defects.
5. Of the several research studies that are reported with college students, the speech correction groups were found to possess socially undesirable personality traits. They tend to be more neurotic and less emotionally stable than other college students having normal speech.
6. Of the three reported studies with elementary school children, there is little evidence of the possible influence of speech defects on personality. In the limited number of cases sampled, the speech defective group indicated no definite tendency toward maladjustment.

The above data indicate a diversity of opinion about the emotional instability of people with articulatory speech defects. In college students, speech defects indicate emotional instability; in elementary school pupils, such a relationship has not yet been shown. Therefore, a need for further investigation is warranted. Before the conclusion can be accepted that articulatory defects in elementary school children are not associated

with emotional instability, more observation is necessary.

There is a need for statistical data that would:

1. Show the attitude of speech defective children toward speech, and

2. Sample the personal and social adjustment of a number of children with articulatory defects.

This analysis will attempt to further investigate the problem of whether emotional instability is evident in children with articulatory defects, and obtain evidence concerning the hypothesis that the speech defect itself contributed to the emotional instability. If the hypothesis is supported, speech training would apparently be an effective instrument for resolving any mild or more serious maladjustment.

CHAPTER III

STANDARDS FOR EVALUATION

This particular approach to an objective analysis concerning the relationship of articulatory defects to emotional instability involved (a) the selection of a standardized personality inventory, (b) the construction of a speech attitude scale, (c) the selection of a group of children with articulatory defects and an equated control group, (d) the administration of the tests to the two groups, and (e) the recognition of the limitations of the study.

A. The Standardized Personality Test

The first problem in this empirical study was the selection of a standardized personality inventory. After a survey of several inventories, the California Test of Personality (CTP)--Primary Series, was chosen because of the following distinctive features: (1) it is designed to reveal the extent to which a group of pupils is adjusting to the problems and conditions which confront them, (2) it indicates how pupils feel about themselves (personal adjustment) and how they function as social beings (social adjustment), (3) it permits a comparison in terms of inventory scores, the adjustment patterns and habits of

a specific group (i.e., speech defective children) with a large representative group, (4) it is based upon a study of over 1,000 adjustment patterns and responses to specific situations which confront children of these ages, and (5) it is graded, so that it may be used on groups ranging from grade one through college.

In critical analysis of the CTP, Percival Symonds commented, "This instrument would appear to be one of the most carefully prepared questionnaires of this type."²⁴

For more conclusive evidence of reliability in definite terms, the 1953 manual of the CTP reports the reliability coefficients (apparently internal consistency coefficients) to be: Total Adjustment .88, Personal Adjustment .83, and Social Adjustment .80.²⁵

In statistical analysis of the CTP, Eldon E. Jacobsen reports the stability coefficients (with five to six weeks' interval) to be: Total Adjustment, $.69 \pm .06$ for the first grade, and $.77 \pm .04$ for the third grade; Personal Adjustment, $.52 \pm .08$ for the first grade, and $.73 \pm .04$ for

²⁴Percival M. Symonds, (Professor of Education, Columbia University) in Oscar K. Buros, The Third Mental Measurements Yearbook (New Jersey: Mental Measurements Yearbook, 1941), p. 1214.

²⁵Louis P. Thorpe, Willis W. Clark, and Ernest W. Tiegs, California Test of Personality--Primary Series: Manual (Los Angeles, California: California Test Bureau, 1953), p. 4.

the third grade; Social Adjustment, $.64 \pm .06$ for the first grade, and $.75 \pm .04$ for the third grade.²⁶

Although some of these considerations prompted the selection of the inventory, there are certain limitations which are recognized in the use of any personality inventory. First, one might ask whether questions which are asked and answered as a part of a school requirement can be expected to reveal underlying trends which may be apparently not felt to exist in the personality. Secondly, by asking pupils questions about themselves, one is securing evidence of only one kind of adjustment, namely, the pupil's own attitude toward himself. Thus, the questionnaire is more limited in its applications than its name, "Test of Personality," would indicate.

But these criticisms would apply with equal force to all personality inventories of this general type, for such instruments should not be used for the basis of a program of individual diagnosis and treatment without knowing more of the developmental history and family background of the pupil. This statement would appear to be in accordance with the viewpoint of the authors of the CTP:

²⁶Eldon E. Jacobsen, "Assessment of Adjustment in Children and Adolescents: Reliabilities and Relationships Concerning Common Group Tests and Ratings and Their Relationships to Judgments from Clinical Tests" (unpublished PhD dissertation, University of Washington, Seattle, 1955), p. 68.

Personality is not something separate and apart from ability or achievement but includes them; it refers rather to the manner and effectiveness with which the whole individual meets his personal and social problems, and indirectly the manner in which he impresses his fellows . . . Individual reactions to items are obtained, not primarily for the usefulness of total or section scores, but to detect the areas and specific types of tendencies to think, feel, and act,²⁷ which reveal undesirable individual adjustment.

In research where group average differences in specific traits or social adjustment are being investigated, the value of such inventories becomes more definite in indicating general tendencies toward emotional instability or a difference in attitude of a group.

B. The Speech Attitude Scale

Accepting the hypothesis that a speech defect can give rise to adverse emotional reactions to speech, these reactions would be evident, as appearing on a speech attitude scale. The construction of this scale presented a problem in that a measuring instrument was necessary which would sample a number of speaking situations, use a language suitable for children in the primary grades, avoid stereotyped answers, be similar in form to the selected standardized personality inventory, and be brief enough to permit administration in a reasonable time.

²⁷Thorpe, Clark, and Tiegs, op. cit., p. 2.

Suggestions for questions used in the Speech Attitude Scale (SAS) were obtained from Franklin H. Knower's Speech Attitude Scale²⁸ and from William R. Tiffany's Speech Attitude Scale for Stutterers.²⁹ However, the majority of questions were formulated by the writer and sought to sample as many of the child's speaking situations as possible. Therefore, questions revealing his attitude toward speech in the home, the school, and in the neighborhood and community were felt to be pertinent. From a preliminary group of sixty questions taken from the previously mentioned sources, twenty-two questions were chosen for the final scale, given in Appendix A.

The questions were worded so as to require a YES or NO answer, as was the case with the personality inventory. Every effort was made to phrase the questions clearly, concisely, and in a language intelligible to the elementary school child.

The greatest difficulty encountered was phrasing questions which would elicit the child's reaction to

²⁸Franklin H. Knower, "A Study of Speech Attitudes and Adjustments," Speech Monographs, V (1953), pp. 130-203.

²⁹William R. Tiffany, "An Experimental Study of the Growth of Speech and Stuttering Attitudes in Children," (unpublished Master's thesis, the University of Washington, Seattle, 1947), pp. 82-85.

speech, rather than his attitude toward his parents or the situations involved. Instead of asking, "Do other people ever make fun of your speech?" or "Do you think children should tell their parents about the things they do?" the questions were worded, "Are you ever afraid that other people make fun of your speech?" or "Do you like to tell your parents about the new things you do or see?" Thus, the SAS sought to determine the speech defective child's reactions to speech in various situations since it was felt those feelings could be the key to his intimate personality status, as well as his possible improvement.

The scale was scored by counting the number of undesirable responses and subtracting that number from twenty-two, the total score.

Since the scale was designed by the writer to sample a small segment of the population's attitude toward speech situations, it was necessary to obtain an estimate of its reliability. This was accomplished by administering the scale twice to twenty-five youngsters in a Second-Third grade room at the College Elementary School, with a week's interval. For the first test, the mean was computed to be 13.89, with a mean of 14.36 for the retest--a slight rise in test scores. The reliability was established by using the Product-Moment formula, and resulted in an r of

.536, with a standard error of $\pm .14$. This would indicate a moderate degree of reliability, significant beyond the one per cent level of confidence. The restricted sample of students in the College Elementary School, who showed largely favorable speech attitudes, probably resulted in a lower reliability coefficient than might be found with a wider sample. The approach used for establishing the reliability of the scale may be examined in Appendix B.

C. The Subjects

The Speech Defective Group

The children used in this study were selected from grades one through three of the Auburn School District, a medium class, urban area of King County, Washington. The speech defective children had been screened from the Auburn Schools by the classroom teachers and reported to the speech therapist as articulatory cases.

Each teacher gave an opinion as to the severity of the defect and an independent judgment was made by the writer. The writer's judgment was made after listening to a sample of the child's speech in a brief conversation and making a phonetic inventory before the tests (this situation is standard in part of the diagnosis for all reported articulation cases, and was not devised to

accommodate only this particular study). The articulation defects were diagnosed as either mild, moderate, or severe.

To standardize the teachers' opinions, the following categories were designed for their use:

1. A mild defect was considered one which would be noticed by an untrained observer, but not considered offensive. Slight articulation defects would not involve more than two sounds.

2. A moderate defect refers to the type of speech which can readily be recognized by a person as deviating considerably from accepted speech. The sounds and omissions would be serious enough to mark the speech as unquestionably defective. Any number of sounds would be affected.

3. A severe defect is one which definitely interferes with communication. Such defects may have an organic or functional basis, but preclude, to some degree, successful social adjustment. Numerous sounds, so poorly pronounced that recognition is almost impossible, are characteristic of a severe speech defect.

Where the diagnosis made by the investigator and the teachers differed, the estimate made by the teacher was adopted on the assumption that the teacher was better able to compare the subject's speech with that of other

classroom children. However, arguments against this procedure could easily be made, for the teacher, through longer association with the child, might become accustomed to the particular defect and thus give a biased judgment. The therapist's judgment, being more objective, could easily be more valid. Also, a diversity of opinion between the speech therapist and the classroom teachers as to the severity of the defect could be explained on the basis of a difference in criteria used in judgment. Several cases which were judged as moderate by the teachers were estimated as mild defects by the writer. The difference is logically explained by the fact that the testing and interviewing were completed some months after the teachers' judgments were made. Thus, the child with a moderate defect may have benefitted by the therapy to a sufficient extent as to be diagnosed as mild. This difference is further substantiated by the fact that a few of the mild cases were considered sufficiently rehabilitated to attend speech classes only once a week at the time of testing.

The information compiled for each case included a list of factors, as outlined in Appendix C. Since intelligence scores were available only on the second and third grade subjects, an estimate of the intelligence of the first grade subjects was made by the classroom

teacher of each subject. Information which regarded the home situation of each subject was gained during the writer's conference with the mothers of the subjects. Also, at this time, an explanation of the purposes for this particular study was made to the parent, and verbal parental consent was given for the participation of each subject in the program.

The Controls

The control group was selected by a parallel-group technique (that is, both groups were as nearly equivalent as possible, except for the one variable, the speech deficiency). A mimeographed brief for grades one, two, and three, describing each speech defective subject by the factors listed in Appendix C was prepared and distributed to each classroom teacher in the respective grades in the Auburn district. Each teacher was then asked to select a child, or children, from her class that most nearly matched any of the subjects in the experimental group on the basis of the characteristics outlined in Appendix C.

Some difficulty was expressed by a few of the teachers in the primary grades, who considered some experimental cases unique ones and felt that the equivalent

was only to be found in a lower grade. In each case where such difficulties occurred, a control match was found in another classroom, or another school, if necessary, but the criteria was unaltered.

The two groups may be compared in Tables 1, 2, 3, and 4.

Table 1 indicates the distribution of number in both groups. Twelve of the speech defective group are from grade one, twelve are from grade two, and twelve are from grade three, giving a total of thirty-six experimental cases. The same number, with the same ratio of students from each grade, were included in the control group.

Table 2 gives a comparison of the two groups, according to sex and grade. In grades one and three, the number of males was dominant, with nine from the first, and eight from the second. However, this ratio was reversed in the second grade, and there were seven girls, with only five boys.

Table 3 shows a comparison of the available intelligence quotient scores for both groups. Of the speech defective group, only thirty-six per cent of the scores were available, and those showed a mean intelligence quotient of 98.8. Only twenty-nine per cent of the scores were available for the control group, with those showing

a mean intelligence quotient of 101.6.

Table 4 shows a comparison of the classroom teachers' and the writer's estimates as to the severity of the speech defect for the experimental group. In grade one, the majority of the cases were judged severe by the teachers, but the writer judged only sixteen per cent of the grade-one subjects to be severe articulation cases.

In grade two, the teachers estimated that half of the cases were mild, and half were moderate articulation cases, but the writer judged that seventy-five per cent of the cases were mild articulation problems, and only twenty-five per cent as being moderate in degree of severity.

In grade three, the teachers' estimates were fairly even distributed, but the writer rated sixty-six per cent of the experimental cases to be mild articulation problems, with only twenty-six per cent and eight per cent in the moderate and severe categories, respectively.

TABLE 1

A COMPARISON OF THE GRADE LEVELS OF THE SPEECH
DEFECTIVE GROUP AND THE CONTROL GROUP

Grade	Defects	Controls
I	12	12
II	12	12
III	<u>12</u>	<u>12</u>
Totals	36	36

TABLE 2

A COMPARISON OF THE SPEECH DEFECTIVE GROUP AND
THE CONTROL GROUP ACCORDING TO SEX AND GRADE

Grade	Male	Female
I		
Defects	9	3
Controls	9	3
	(75%)	(25%)
II		
Defects	5	7
Controls	5	7
	(42%)	(58%)
III		
Defects	8	4
Controls	8	4
	(67%)	(33%)
	<hr/>	<hr/>
Total Defects	22	14
Total Controls	22	14
	(61%)	(39%)

TABLE 3
A COMPARISON OF AVAILABLE INTELLIGENCE QUOTIENT
SCORES ON THE SPEECH DEFECTIVE GROUP
AND CONTROL GROUP

Group	Per Cent of Scores Available	Mean I.Q.
Defects	36	98.8
Controls	29	101.6

TABLE 4

A COMPARISON OF CLASSROOM TEACHERS' AND WRITER'S
ESTIMATE OF THE SEVERITY OF THE SPEECH DEFECT

Group	Classroom Teachers' Estimate			Writer's Estimate		
	Mild	Moderate	Severe	Mild	Moderate	Severe
Grade I Defects	1 (8%)	4 (33%)	7 (59%)	5 (42)	5 (42%)	2 (16%)
Grade II Defects	6 (50%)	6 (50%)	0 (0%)	9 (75%)	3 (25%)	0 (0%)
Grade III Defects	4 (33%)	5 (42%)	3 (25%)	8 (66%)	3 (26%)	1 (8%)
Totals	11 (30%)	15 (42%)	10 (28%)	22 (62%)	11 (31%)	3 (7%)

From the preceding discussion and the Tables, the following information may be summarized about the groups tested:

1. An equal distribution of number was found in each grade.
2. Sixty-one per cent of the cases tested were boys.
3. The control group had a slightly higher mean intelligence quotient than the speech defective group. However, the limited number of test scores available makes any assumption as to the differences in intelligence between the two groups insignificant.
4. Forty-two per cent of the experimental group were considered, by the teachers, to have moderate speech defects, but the writer ranked sixty-two per cent of the experimental group as being mild speech defectives.

Using the matching criteria (as found in Appendix C) the groups were equated as closely as possible. This could eliminate the possibility that any differences in self-ratings between the two groups might arise as factors of non-equation.

D. The Administration of the Tests

Since the subjects ranged in grade one through three, it was possible to use one form (AA) of the CTP to obtain self-estimates on personality for each subject.

The SAS was given first in every case. With the first grade students who did not have sufficient reading vocabulary to follow the printed questions, it was necessary to read the questions aloud to each pupil and in some cases where reading skills were not as well developed as necessary, the responses of the pupils were recorded by the investigator. To keep all the factors in the administration of the test as constant as possible, the writer read the test questions to all older groups, but permitted them to encircle their own answers. The first grade students were tested individually, or in groups of two, with a short recess between sections one and two of the personality inventory. They were seated with their backs to each other at small tables and used markers to follow the questions in their booklets. For the second and third grades, where the pupils were able to follow the questions when read aloud, the test was read clearly and slowly to groups ranging from four to eight. In these cases, each child encircled his own answers.

Rapport was established first, by explaining to each

child or group of children that they had been selected as one of seventy-two boys and girls to be called from class work to help adults determine how children generally feel about speech and other matters pertaining to speech in the home and school. Secondly, rapport was established by the writer's further explanations that grown-ups often forget how they felt about speech when they were in grade school, and it was hoped that the children felt their honest opinions about speech would enable adults to do a better job of helping those who had more difficulty with speech than they did. Thirdly, the fact was stressed that there were no correct answers to the questions, and the reason they were asked was that adults agreed they did not know the answer, and needed a "second grader's good opinion." And lastly, it was emphasized that their thoughtful, honest answers to the questions on the tests would be used to help other boys and girls to speak effectively and clearly.

By putting two sample questions on the board as examples (i.e., "Do you have a dog at home?" and "Did you walk all the way to school this morning?") and encircling a sample YES or NO, the examiner illustrated that there were no right or wrong answers to the questions, because some children would answer YES, and others NO. Thus,

since there were no right or wrong answers, they were merely to answer as honestly as possible as to how they felt about the matter expressed in each question.

The questions were read so as not to betray by inflection or expression the "right" answer. Where doubt or hesitancy was evident, the examiner asked the child to think how he felt or what he did about a situation most of the time, and then encircle that answer.

The administration of the SAS first proved advantageous because the questions in the test asked for opinions about speech and speaking situations and confirmed the statements made in the establishment of rapport. As the method of answering was similar in the inventory that followed (the CTP), further explanation was unnecessary; the questions appeared to be answered in a serious, thoughtful manner.

E. The Limitations

There are certain limitations in this particular study that should be noted.

The limited number of both experimental and control cases prevented as adequate a statistical sampling of factors in the criteria for matching as might be desired.

The limited number of experimental cases did not

yield a normal sampling as to severity of defect.

Because of the limited number of control cases, there were some limitations of the factors involved in the matching criteria.

A test of reliability for the SAS would have been more meaningful, had it been administered to both groups involved in this study.

Areas of exploration that could have been included in the matching criteria:

- A. Intelligence ratings of parents and siblings.
- B. Personality ratings of parents and siblings.

This chapter has presented the standards for evaluation, and has discussed the reliabilities for the two test instruments that were used. The results of the statistical analysis of this study are discussed in the following chapter.

CHAPTER IV

EVALUATION AND RESULTS

This particular problem involves an attempt to test the hypothesis that emotional instability, as measured by the California Test of Personality (CTP), is evident in children with articulatory defects. Such a finding would show that the speech defect contributes to the emotional instability or that emotional instability is a relevant antecedent of articulatory disorders.

To resolve the problem, certain methods of evaluation were employed: (1) selection of a standardized personality inventory, (2) the construction of a speech attitude scale, (3) the selection of a group of children with articulatory defects and an equated control group, the articulation defect being the variable under control, with personality as the factor to be measured (in this case serving as the dependent variable), (4) the administration of the tests to the two groups, and (5) the evaluation of the results.

A comparison of the experimental and control groups used in this study was made by analyzing the scores on (A) the CTP and (B) the Speech Attitude Scale (SAS). In evaluating the data on the SAS, a correlation coefficient was calculated to obtain an estimate of its reliability.

A. The California Test of Personality

In comparing the two groups on the CTP, the scores on personal adjustment, social adjustment, and total adjustment were used. The personal adjustment score was obtained from six sub-tests containing questions purporting to ascertain the child's self-reliance, sense of personal worth, sense of personal freedom, feeling of belonging, withdrawing tendencies, and nervous symptoms. The social adjustment score was determined from questions purporting to assess the student's social standards, social skills, anti-social tendencies, family relations, school relations, and community relations. By adding the personal adjustment score and the social adjustment score, the total adjustment of each child was calculated.

To establish the statistical significance of the mean difference between the two groups, t-tests were computed. As shown in the following table, the t-test results indicate a high level of significance for all areas.

From an examination of the data presented in Table 5, a comparison of the two groups may be made to determine the relative emotional stability of the speech defective child and the child with no articulatory disorder. Inspection of mean scores, and the mean difference of the scores, and level of confidence shows that the two groups

are significantly different in personal adjustment, social adjustment, and total adjustment. In every section of the test, the speech normal children showed a higher group mean. For example, finding the significance to be beyond the one per cent level of confidence would suggest, if the experiment were replicated, that ninety-nine times out of one hundred we would expect the mean of the speech normal group to be higher than the mean for the speech defective group.

TABLE 5

A COMPARISON OF MEAN SCORES ON
CALIFORNIA TEST OF PERSONALITY--PRIMARY SERIES
FOR CHILDREN WITH ARTICULATION DISORDERS AND SPEECH-NORMAL CHILDREN

AREAS OF MEASUREMENT	N	Group Mean Raw Scores	Mean Diff.	Std. error of mean difference	D.F.	t	Significance Level
Personal Adjustment			6.64	1.05	35	6.32	Beyond 1%
Experimentals	36	27.61					
Controls	36	34.25					
Social Adjustment			3.42	1.35	35	2.35	Beyond 2%
Experimentals	36	35.19					
Controls	36	38.61					
Total Scores			10.05	1.93	35	5.21	Beyond 1%
Experimentals	36	62.81					
Controls	36	72.86					

As a group, speech defective children are characteristically significantly less emotionally stable, as determined by the CTP.

1. Personal Adjustment

On the personal adjustment section of the CTP, the speech normal group show a mean of 34.25, which is higher than the speech defective group's average of 27.61. The standard deviations of ± 7.28 for the speech defectives and ± 6.63 for the controls indicate that the scores of both groups on personal adjustment are similarly distributed. The mean difference between the two groups is 6.64. The obtained value of t , 6.32, exceeded the one per cent level of significance.

2. Social Adjustment

The scores on social adjustment of the two groups show the same trend as the total and personal adjustment scores. The control group children in the primary grades, with mean scores of 38.61 and a standard deviation of ± 6.08 , may have a few more social skills and fewer anti-social tendencies. As such, the responses suggest that the majority of them probably maintain better family, school, and community relations than the children with articulatory defects who have a mean score of 35.19 with

a standard deviation of ± 6.93 . Again, the two distributions are similar. The mean difference between the two groups is 3.42. With thirty-five degrees of freedom, t resulted in a figure of 2.35, one that is beyond the two per cent level of significance.

3. Total Adjustment

Total adjustment scores suggest that the speech defective group with a mean of 62.81 SD ± 12.57 are not as emotionally stable as the controls with 72.86 SD ± 8.37 . However, the standard deviation of the control group at ± 8.37 indicates less variability within the group than the speech defective group with ± 12.57 . The speech defectives' scores are less clustered around the mean--being much more diversified than the control groups' scores. A mean difference between the two groups was computed to be 10.05 and the t -test resulted in a figure of 5.21. This revealed that the significance of the obtained differences was beyond the one per cent level of confidence.

On the basis of these results, it is possible to reject the null hypothesis (that there is no difference between the means of the two groups) as improbable, and regard the obtained differences in the test results as being truly representative of two different populations, and not occurring as chance variation from the selection

of samples. It can be assumed with considerable confidence that children with speech disorders, as a group, manifest less adequate self-perceptions of personality than children without speech disorders.

Complete data, showing the distributions of the raw scores, means, and standard deviations for both groups on the CTP are shown in Appendix E.

B. The Speech Attitude Scale

In comparing the two groups on the SAS, each test was scored by counting the number of undesirable responses, from a speech therapist's standpoint, and subtracting that number from twenty-two, the total score.

In order to estimate the reliability of the scale, a correlation coefficient was calculated. This was accomplished by administering the scale twice (one week interval) to a Second-Third grade room at the College Elementary School, then computing a Product-Moment Correlation Coefficient between the two tests. The stability coefficient was found to be .536, with a standard error of $\pm .14$, giving the scale a moderate degree of reliability, significant beyond the one per cent level of confidence. The individual scores used for the Product-Moment Correlation of the scale may be examined in Appendix B.

A t-test of significance was computed for the mean difference between scores on the SAS. An example of the calculation of t is included in Appendix D. As shown in Table 6, a mean for the speech defectives on the SAS proved to be 9.28 SD ± 2.73 , with the mean for the controls being 12.36 SD ± 2.60 , giving a mean difference between the two groups of 3.08, with a t of 5.22. This shows the difference to be significant at the one per cent level of confidence. This suggests that there is only one chance in one hundred that the difference is due to chance factors.

Inspection of the data shows that there is a definite difference between the two groups in attitude toward speech, as measured by the SAS. The control group tends to have a less negative (more favorable) attitude toward situations involving speech. However, the scores for the control group tend to be more diversified. Complete data, showing the distributions of the raw scores, the means, and the standard deviations for both groups on the SAS are shown in Appendix F.

TABLE 6

A COMPARISON OF MEAN SCORES ON
 SPEECH ATTITUDE SCALE
 FOR CHILDREN WITH ARTICULATION DISORDERS
 AND SPEECH-NORMAL CHILDREN

AREA OF MEASUREMENT	N	Group Mean Raw Scores	Mean Diff.	Std. error of mean diff.	D.F.	t	Significance Level
Speech Attitude Scale			3.08	.59	35	5.22	Beyond 1%
Experimentals	36	9.28					
Controls	36	12.36					

An item-by-item analysis of the SAS, as given in Table 7, provides further comparison of the two groups and throws further light on the speech defective child's attitude toward speech. Scoring was accomplished by designating items "incorrect" which show "poor speech attitudes" insofar as speech therapists are concerned.

It should be noted that on seven questions, the speech defective children show a more definite negative attitude toward speech than the control group. On question 1, eighty-three per cent of the speech defective children indicate that their fathers do not let them talk as much as they would like at home, but only sixty per cent of the speech normal children indicated the same answer. In question 6, forty-one per cent of the speech defectives answered NO to the question, "Do your parents think that you speak well?" compared to sixteen per cent of the controls. The answers on these two questions tend to suggest a reaction on the part of the speech defective group to parental attitudes regarding speech.

On the other questions--numbers 13, 14 and 15--the speech defective group indicated more negative attitudes toward speech than the control group.

The most striking difference between groups appears in the answers to question 20, where sixty-five per cent

TABLE 7

A COMPARISON OF THE TWO GROUPS ON THE NUMBER OF "POOR SPEECH ATTITUDE" ANSWERS
ON THE SPEECH ATTITUDE SCALE

Questions with Desirable Attitude Answer	Per Cent of Defects Answering in terms of Poor Speech Attitude	Per Cent of Controls Answering in terms of Poor Speech Attitude
1. Does your father let you talk as much as you like at home? (YES)	83 (NO)	60 (NO)
2. Does your mother let you talk as much as you like at home? (Yes)	69 (NO)	50 (NO)
3. Do your parents often correct you at home when you speak? (NO)	81 (YES)	70 (YES)
If YES, does it bother you to have them correct you? (NO)	35 (YES)	20 (YES)
4. Do your parents often correct your speech in front of others? (NO)	50 (YES)	35 (YES)
If YES, does it bother you to have them correct your speech in front of others? (NO)	45 (YES)	30 (YES)
5. Do you have to be careful how you speak for fear you will be corrected? (NO)	74 (YES)	65 (YES)

TABLE 7 (Continued)

Questions with Desirable Attitude Answer	Per Cent of Defects Answering in terms of Poor Speech Attitude		Per Cent of Controls Answering in terms of Poor Speech Attitude	
6. Do your parents think that you speak well? (YES)	41	(NO)	16	(NO)
7. Are you ever afraid that other people will make fun of your speech? (NO)	20	(YES)	14	(YES)
8. Would you like to be allowed to ask your parents more questions about things? (NO)	60	(YES)	59	(YES)
9. Do you like to tell your parents about the new things you've done or seen? (YES)	10	(NO)	10	(NO)
10. Do you like to tell the things you have done or seen in your class? (YES)	20	(NO)	16	(NO)
11. Do you like to read aloud to the class? (YES)	30	(NO)	24	(NO)
12. Do you think other people in your class speak better than you do? (NO)	80	(YES)	65	(YES)
13. Do others like to listen to you when you tell about the things that happen to you? (YES)	35	(NO)	11	(NO)

TABLE 7 (Continued)

Questions with Desirable Attitude Answer	Per Cent of Defects Answering in terms of Poor Speech Attitude		Per Cent of Controls Answering in terms of Poor Speech Attitude	
14. Do you enjoy talking to the older children? (YES)	38	(NO)	10	(NO)
15. Is it hard for you to talk to a group of children who are not your good friends? (NO)	75	(YES)	52	(YES)
16. Do you worry about talking to grownups or strangers because of your speech? (NO)	30	(YES)	12	(YES)
17. Do you think that pretending or talking to make-believe playmates is more fun than talking to your friends? (NO)	16	(YES)	11	(YES)
18. Do you think that your parents like to have you talk when company is present? (YES)	84	(NO)	80	(NO)
19. Do you think we should make fun of the people who do not speak well on the radio, or in the movies, or TV? (NO)	6	(YES)	0	(YES)
20. Do you ever feel ashamed of yourself because of your speech? (NO)	65	(YES)	20	(YES)

of the speech defective group indicated that they have felt ashamed of themselves because of their speech, while only twenty per cent of the control group felt the same way. The answers of the speech defective groups suggest an awareness of the speech defects.

The item-by-item analysis of the SAS substantiates the earlier findings that the two groups do differ in their reactions to speech, with the speech defective group showing a consistently higher percentage of "poor speech attitude" answers than the control group.

In analysis of the questions on the SAS, it seems that the wording of these questions may have been such that they called for an attitude toward parental discipline rather than toward speech. That a great many fathers do not let their children talk as much as they like in the home, that many parents often correct the child's speech, that some parents feel children ask too many questions, and that most parents feel children are not to take too active a part in conversation with company--all can readily be considered a part of the home discipline. How much such discipline directly or indirectly affects the child's speech is beyond the scope of this paper.

The results as presented, have shown that the control group consistently scored a higher mean in all

sections of the CTP, in personal adjustment, social adjustment, and in total scores.

The results have also shown that the control group show a higher mean than the experimental group on the SAS.

The results have further shown that children with articulatory defects are not as well adjusted as children without speech defects (as indicated by the CTP), both in personal and social adjustments, and in total adjustments.

In addition, the results have shown that children with articulation defects have a less positive attitude toward speech than do the children without speech defects.

These differences were tested for significance and suggest the improbability of the difference being due to chance selection of the sample, but rather actual differences in emotional adjustment and attitude toward speech.

CHAPTER V

SUMMARY

The purpose of this study was to determine whether a group of children with articulatory defects differed significantly in emotional stability from a control group when measured by a standardized personality inventory designed to reveal the personal and social adjustment and a speech attitude scale devised to detect reactions to speech situations. To accomplish this, an experimental group of thirty-six speech defective children and a control group of thirty-six speech normal children were selected from the primary grades, twelve in each group from each grade. The groups were matched according to all available relevant factors (listed in Appendix C). Scores were obtained for each child in the two groups on (1) personal adjustment, (2) social adjustment, and (3) total adjustment, taken from the California Test of Personality (CTP), and (4) the Speech Attitude Scale (SAS), constructed by the researcher.

From the tabulation of data, the following conclusions are justifiable and answer the questions posed in the opening chapter:

1. Children with articulatory defects in the primary

grades do differ significantly in personal adjustment, social adjustment, and total adjustment in personality from a matched control group when measured by the CTP.

2. The children with articulatory defects tend to have a less positive attitude toward speech than a control group of speech normal children, when measured on the SAS.

From the above conclusions of this study, the following observations are made as highly probable:

1. Emotional instability, as measured by the CTP, can be substantiated as a causal factor in articulatory defects, or the possibility exists that a speech defect may be a relevant antecedent of emotional instability.
2. The speech defect can be a causal factor in the difference of attitude toward speech, or even more important, from a preventative standpoint, speech attitude seems to be a relevant antecedent of the defect.

Before such observations are accepted as fact, however, further research is needed. First, it is felt that a more effective speech attitude scale could be designed through further experimentation. Such an

instrument could make it possible to determine early, a difference in attitude toward speech and thus make speech correction more effective in absolving such difficulties. Secondly, further research with children diagnosed as having severe or moderate defects is needed to substantiate the relationship between articulatory defects and emotional stability. This small sampling contained only three cases diagnosed as severe in the experimental group of the present study. More severe cases in the experimental group, rather than those diagnosed with less severity would provide greater definitiveness. Also, it would be desirable to have investigations on the diversity of judgments by therapists and teachers as to the severity of the defect. Thirdly, research which will test a sufficiently large number of children in each grade, especially the older elementary school children, is needed to determine the possible growth of any difference in attitudes toward both speech and emotional stability. And finally, experimentation with two groups of children with articulatory defects--one group having speech correction and the other not--would ascertain the part that speech rehabilitation might take in alleviating the less favorable attitudes toward speech and emotional stability.

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APPENDIX

APPENDIX A

SPEECH ATTITUDE SCALE

Instructions to pupils: After each of the following questions mark a circle around the YES or NO. The answers are not right or wrong, but show how you feel about speech.

- | | | |
|--|-----|----|
| 1. Does your father let you talk as much as you like at home? | YES | NO |
| 2. Does your mother let you talk as much as you like at home? | YES | NO |
| 3. Do your parents often correct you at home when you speak? | YES | NO |
| If YES, does it bother you to have them correct you? | YES | NO |
| 4. Do your parents often correct your speech in front of others? | YES | NO |
| If YES, does it bother you to have them correct your speech in front of others? | YES | NO |
| 5. Do you have to be careful about how you speak for fear you will be corrected? | YES | NO |
| 6. Do your parents think that you speak well? | YES | NO |
| 7. Are you ever afraid that other people make fun of your speech? | YES | NO |
| 8. Would you like to be allowed to ask your parents more questions about things? | YES | NO |
| 9. Do you like to tell your parents about the new things you have done or seen? | YES | NO |
| 10. Do you like to tell the things you have done or seen to your class? | YES | NO |

- | | | | |
|-----|---|-----|----|
| 11. | Do you like to read aloud to the class? | YES | NO |
| 12. | Do you think other people in your class speak better than you do? | YES | NO |
| 13. | Do others like to listen to you when you tell about the things that happen to you? | YES | NO |
| 14. | Do you enjoy talking to the older children? | YES | NO |
| 15. | Is it hard for you to talk to a group of children who are not your good friends? | YES | NO |
| 16. | Do you worry about talking to grownups or strangers because of your speech? | YES | NO |
| 17. | Do you think that pretending or talking to make-believe playmates is more fun than talking to your friends? | YES | NO |
| 18. | Do you think that your parents like to have you talk when company is present? | YES | NO |
| 19. | Do you think we should make fun of the people who do not speak well on the radio, or in the movies, or TV? | YES | NO |
| 20. | Do you ever feel ashamed of yourself because of your speech? | YES | NO |

APPENDIX B

SAMPLE DATA USED IN COMPUTING A STABILITY COEFFICIENT FOR
THE SPEECH ATTITUDE SCALE

Test X	Retest Y	X ²	Y ²	XY
19	20	361	400	380
17	18	289	324	306
16	15	256	225	240
15	15	225	225	225
15	12	225	144	180
15	13	225	166	215
15	17	225	289	255
15	12	225	144	180
14	16	296	256	224
14	13	196	166	182
14	12	196	144	156
14	17	196	289	238
14	18	196	324	252
14	14	196	196	196
14	11	196	121	154
14	15	196	225	210
13	13	166	166	166
13	15	166	225	215
13	12	166	144	156
12	16	144	256	192
12	16	144	256	192
12	11	144	121	132
12	11	144	121	132
10	10	100	100	100
10	12	100	144	120

M 13.84

M 14.36

1 week's interval

 $r = .536$
 $r_D = \pm .14$

APPENDIX C

MATCHING CRITERIA FOR PARALLEL-GROUP TECHNIQUE

- I. School grade
- II. Sex
- III. Race
- IV. Chronological age
- V. Retention
- VI. Records of
 - A. Achievement
 - B. Abilities
- VII. Physical Rating
 - A. Size
 - B. General Physical Condition
 - C. Handicaps
 - D. Attitude toward
 - 1. Health habits
 - 2. Personal appearance
- VIII. Frequency of absences for previous school year
- IX. Status of child in home
 - A. Adoption/Foster home
 - B. Number of siblings
 - C. Ages of siblings
 - D. Adopted/half/step sisters/brothers
 - E. Ordinal position
- X. Parental Background
 - A. Cultural
 - B. Educational
 - C. Age group
 - D. Health status

E. Occupation

1. Father
2. Mother
 - a. Full time
 - b. Part time

F. Marital status

1. Both parents living
2. Previous divorce

XI. Home Status

- A. Socio-economic group
- B. Stability
- C. Place of residence

1. City
2. Country

D. Type of residence

1. Single unit
2. Multiple unit
3. Project area

XII. Parental attitude toward

- A. Child
- B. School

APPENDIX D

SAMPLE DATA FOR COMPUTING A t -TEST OF SIGNIFICANCE BETWEEN
MATCHED PAIRS OF CHILDREN WITH ARTICULATION DISORDERS
AND SPEECH NORMAL CHILDREN ON THE
SPEECH ATTITUDE SCALE

Exper.	Cont.	D	d	d ²
10	5	5	-1.92	3
10	9	1	2.08	4
11	9	2	1.08	1
10	8	2	1.08	1
11	10	1	2.08	4
14	12	2	1.08	1
13	1	12	-8.92	80
13	10	3	.08	0
11	12	-1	4.08	17
12	12	0	3.08	9
9	6	3	.08	0
11	14	-3	6.08	37
15	8	7	-3.92	15
13	9	4	-.92	0
15	10	5	-1.92	3
11	13	-2	5.08	26
17	10	7	-3.92	15
11	10	1	2.08	4
15	7	8	-4.92	24
15	13	2	1.08	1
17	10	7	-3.92	15
12	13	-1	4.08	17
8	6	2	1.08	1
15	7	8	-4.92	24
17	9	8	-4.92	24
11	12	-1	4.08	17
7	9	-2	5.08	26
11	9	2	1.08	1
13	11	2	1.08	1
14	13	1	2.08	4
14	5	9	-5.92	35
9	9	0	3.08	9
9	7	2	1.08	1
16	9	7	-3.92	15
12	9	3	.08	0
13	8	5	-1.92	3
445	334	111		438

 $\bar{d} = \pm 3.49$
 $\bar{d}_{m_d} = \pm .59$
 $t = 5.22$

APPENDIX E
 COMPARATIVE RAW SCORES OF CHILDREN
 WITH ARTICULATION DISORDERS AND SPEECH NORMAL CHILDREN
 FOR CALIFORNIA TEST OF PERSONALITY
 PRIMARY SERIES (AA)--ALL SECTIONS

	Personal Adjustment		Social Adjustment		Total Scores	
	Exper.	Cont.	Exper.	Cont.	Exper.	Cont.
	25	29	34	32	59	61
	17	39	31	44	48	83
	23	31	30	28	53	59
	31	32	41	44	72	76
	22	36	31	24	53	60
	34	31	28	40	62	71
	25	22	39	35	64	57
	37	38	35	46	72	84
	31	35	24	23	55	58
	26	29	32	34	58	63
	28	28	32	29	60	57
	15	21	19	34	34	55
	28	32	36	41	64	73
	30	34	32	40	62	74
	31	37	46	38	77	75
	32	36	39	43	71	79
	27	37	34	39	61	76
	32	37	39	46	71	83
	31	39	45	40	76	79
	19	37	31	45	50	82
	32	38	41	41	73	79
	17	38	28	42	45	80
	28	28	32	32	60	60
	34	34	44	43	78	77
	30	37	43	42	73	79
	35	40	41	37	76	77
	18	31	28	44	46	75
	16	29	29	36	45	65
	35	35	45	42	80	77
	40	44	45	44	85	88
	19	35	32	45	51	80
	34	40	39	36	73	76
	18	34	22	37	40	71
	30	39	39	36	69	75
	31	37	44	47	75	84
	33	34	37	41	70	75
N	36	36	36	36	36	36
M	27.61	34.25	35.19	38.61	62.81	72.86
σ	±6.63	±7.28	±6.93	±6.08	±12.57	±8.37

APPENDIX F

COMPARATIVE SCORES OF CHILDREN
WITH ARTICULATION DISORDERS AND SPEECH NORMAL CHILDREN FOR
THE SPEECH ATTITUDE SCALE

	Experimentals	Controls
	5	10
	9	10
	9	11
	8	10
	10	11
	12	14
	1	13
	10	13
	12	11
	12	12
	6	9
	14	11
	8	15
	9	13
	10	15
	13	11
	10	17
	10	11
	7	15
	13	15
	10	17
	13	12
	6	8
	7	15
	9	17
	12	11
	9	7
	9	11
	11	13
	13	14
	5	14
	9	9
	7	9
	9	16
	9	12
	8	13
N	36	36
M	9.28	12.36
S	±2.73	±2.60