

EMOTIONAL CONCOMITANTS OF SPEECH DISORDERS

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PREFACE

Professionals in the area of speech have long felt that children with the voice disorder associated with vocal nodules differed emotionally from other children. This study sought to better delineate this hypothesized difference. The hope was that increased understanding might ultimately result in more effective evaluation, prevention and treatment of this disorder and problems associated with it.

I wish to express my sincere appreciation to H. Stephen Caldwell, my thesis adviser, for his direction, his investment of time and effort, and his understanding throughout the long course of this study. I also wish to thank committee member Herbert A. Leeper for his advice and expertise in the area of speech disorders. Appreciation is also expressed to committee member Robert Schlottmann for his time, interest, and encouragement and to Elliot Weiner for his suggestions and critique of the study. I also want to thank Tom Smith for his invaluable computer assistance.

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CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

The manner in which an individual expresses oneself through speech, language, and voice patterns has been of interest to professionals in both psychology and speech. Although there are definite uniquenesses to inquiry by professionals in these disciplines, ranging from acoustic analyses of speech signals to psychodynamic conceptualizations, collaborative research would facilitate all involved gaining a fuller understanding of the relationship between personality characteristics and verbal expression. Results would be important in the differential identification, treatment and prevention of speech disorders.

The term "speech disordered" is a broad diagnostic category which includes, among others, voice and articulation problems (Bloch and Goodstein, 1971). Disorders of voice have to do with harshness, breathiness, and hoarseness, which are defects of tone generation, and nasality, a defect of transmission (Fairbanks, 1960). Several emotional concomitants to voice disorders have been noted in the literature. Aggression (Mosby, 1967; Nemec, 1959), hyperkinesis (Barker and Wilson, 1967), inadequacy feelings and dependency needs (Mosby, 1967) have all been linked to children with voice disorders.

Vocal Nodules

To facilitate a systematic approach to a study of the relationship

between emotional factors and voice disorders, a specific voice disorder is needed. A voice disorder which seems to be relatively consistent in its association with abnormal behavior is that vocal deviation often associated with vocal nodules in children.

Vocal nodules are benign lesions of the vocal cords which are usually bilateral and symmetrical (Arnold, 1962) and are easily visualized by laryngoscopic examination (Cooper, 1973). Vocal nodules are typically found at the junction of the anterior and middle one-thirds and posterior two-thirds of the true vocal folds. In explaining this unanimity, Arnold (1962, p. 211) states, "At this point, the vocal cord vibrations have the widest amplitude. This means that the mechanical impact between the two vibrating cords is greatest here." It is generally agreed that vocal cord nodules are the mechanical result of faulty or excessive vocal use (Wilson, 1961).

Vocal nodules cause the voice of the child to be hoarse and/or strident, and are often accompanied by a breathy quality (Kantor, Wilson, and Leeper, 1969). Additional characteristics include increased vocal loudness, roughness and a voice which is easily fatiguable.

The voice disorder associated with vocal nodules is not an isolated phenomena. One extensive survey found six percent of the children who failed their voice screening were found to have the voice disorder associated with vocal nodules (Senturia and Wilson, 1968). Studies are in agreement as to the greater number of males with vocal nodules with ratios ranging from two to one to four to one (Baynes, 1966; Senturia and Wilson, 1968).

Engel (1972) describes the "typical" treatment program for children

with vocal nodules as including the following goals:

1. Limitation or reduction of vocal abuse.
2. Development of awareness of differences between normal and deviant voices.
3. Establishment of an easy voice.
4. Habilitation of new vocal patterns.

It is of interest to note that although the need for psychotherapeutic intervention is mentioned not infrequently in the research literature on vocal nodules, the typical course of treatment does not include it. Brodnitz (1958), Arnold (1962), and Wilson (1972) all suggested the necessity of taking the psychodynamics of the client into account in any program of therapy for these children.

There seems to be great consistency in clinical reports or observations that link loud, aggressive behavior to children with the voice disorder associated with vocal nodules. However, even with the similarity in clinical reports of behavior of these children, the studies conducted in this area have not been in agreement as to the hypothesized similarities among these individuals.

Few controlled studies with children diagnosed as having vocal nodules have been conducted to test the position that emotional factors play a significant role in this specific voice disorder. The results from the studies which have been conducted tend to be somewhat contradictory. However, it has long been recognized that emotional strain and tension are related to the development of vocal nodules (Cooper, 1973; Rubin and Lehroff, 1962). Further, children with vocal nodules were found to vocalize and misbehave significantly more frequently than their matched controls who did not have vocal nodules

(Barker and Wilson, 1967).

Using the California Test of Personality (CTP), Glassell (1967) found a significant difference between children with vocal nodules and normal controls. On all fifteen areas scored, the children without nodules showed better adjustment. This supported his contention that personality or emotional reactions may result in vocal nodules. A study giving somewhat contradictory results was that of Engel and Heuer (1975). Also using the CTP, Engel and Heuer found no significant differences on any of the areas tested between their group of vocal nodule children and normal controls. They did find, however, that the normal control subjects were found to possess significantly greater personal self-worth.

One problem in previous studies is the comparison of vocal nodule children with normal controls. As Bloch and Goodstein (1971) pointed out, it would seem from data available that any handicapping condition is anxiety arousing. Since the possession of a speech disorder sets these children apart from children with normal verbal expression, it would seem more elucidating in terms of personality deviations distinct to children possessing vocal nodules to compare them with children possessing another speech disorder as well as with normal controls.

Articulatory Disorders and Personality

In searching for a group with which to compare children possessing the voice disorder associated with vocal nodules, certain criteria would be important. The comparison group should possess a functional speech disorder and research should suggest some basic emotional concomitants. A group composed of children with functional disorders of

articulation fulfills both these requirements. Articulatory disordered children are classified as such by their misarticulation of speech sounds.

Several studies have shown these children to differ significantly from non-speech disordered children on certain emotional factors. Some of these differences have been: greater anxiety and tension (Solomon, 1961; Trapp and Evans, 1960; Van Riper, 1963), greater hostility (Fitzsimmons, 1958; Van Riper, 1963), poorer social adjustment and greater behavioral problems (Lerea, 1966; Solomon, 1961; Winitz, 1969), and more numerous fears (Solomon, 1961; Van Riper, 1963). Articulatory disordered children were also shown to come from less desirable emotional environments than non-speech disordered children (Andersland, 1961; Moll and Darley, 1960; Wood, 1946).

These studies indicate that articulatory disordered children have symptoms indicative of emotional conflicts somewhat more severe in nature than evidenced by the control groups. However, this research has one of the same problems as the research with vocal nodule children. This problem is that the articulatory disordered children were compared only with normal controls, that is, children without verbal handicaps. Because of this factor, these studies are subject to the same limitations of interpretation as those studies comparing vocal nodule children to children without verbal handicaps. Important to the basis for this research is the fact that there are no research reports with children who have the voice disorder associated with vocal nodules or with articulatory disordered children which use other than children without verbal handicaps as control groups.

CHAPTER II

STATEMENT OF THE PROBLEM

Both theoretical conceptualizations and clinical observations have led to postulating an association between psychological disturbance and speech disorder. This postulated association will be investigated jointly by the areas of speech and psychology with diagnostic accuracy in identifying the speech disorder provided by speech pathology while the area of psychology would be responsible for personality assessment of the individual.

The voice disorder associated with vocal nodules in children is a handicapping disorder affecting a significant number of children. A majority of these children exhibit an unusually loud, aggressive manner and have the commonality of abusing their voices, a behavior which sets them apart from other children. Several researchers have suggested the need for considering the psychodynamics of the client when formulating a course of therapy for the treatment of this disorder. It would seem to be an area of concern to both psychologists and speech pathologists with a need for the two areas to work together in determining the most efficient form of treatment for this disorder.

Because of minimal data in this area, we do not yet understand what motivational factors are underlying the need of the child to abuse his/her voice. This research is an attempt to identify some of these factors with the aim of assisting in identification, treatment, and

prevention of this voice disorder. To assist in interpreting cause-effect relationships, functional articulatory disordered and non-speech disordered children will be used as the control groups so that deviations found will not be attributable merely to the difference between normal and vocally handicapped children.

The general hypothesis being tested is that children with vocal nodules when compared with functional articulatory disordered children and non-speech disordered children will differ significantly on personal adjustment and direction of aggression. Both the vocal nodule children and the articulatory disordered children would be expected to have a lower level of personal adjustment than the non-speech disordered children. Specific hypotheses would be that vocal nodule children would score lower than normal controls on sense of personal self-worth and school relations while the articulatory disordered children would score higher on nervous symptoms than either of the other two groups. In assessing direction of aggression, the aggression of vocal nodule children would be expected to be directed outward, that of articulatory disordered children would be expected to be directed inward, while the non-speech disordered children would not be expected to show a significant amount of aggression directed either toward the outside world or themselves.

CHAPTER III

METHODOLOGY

Subjects

The subjects were children drawn from six different speech clinics, where the children were currently receiving or had received speech therapy. Three child groups consisting of 10 subjects were employed. Children between the ages of five and eleven years of age and of normal intellectual capacity were studied. Children were considered to be of normal intellectual capacity if they were presently in and functioning at the expected grade level corresponding to their age level as determined by their classroom teacher. The group having the voice disorder associated with vocal nodules (VN) had been diagnosed by laryngoscopic examination as possessing a nodule or nodules on the vocal cords and had voices described as hoarse by a certified speech pathologist. The articulatory disordered (AD) group was composed of children who exhibited a mild to moderate misarticulation of speech sounds but no other voice or language impairments or organic impairments. The third group of children were the normal controls (NC) who were screened for speech problems and exhibited no significant emotional disturbances. All children were reported not to be having hearing difficulties at the time of testing. The children were individually matched for age and sex.

Procedure

The three groups of children were individually administered two personality measures. The first was the California Test of Personality (CTP) which is an objective measure of general adjustment. This test yields twelve individual scores: total adjustment is divided into total social adjustment and total personal adjustment. Total social adjustment is divided into (1) social standards, (2) social skills, (3) anti-social tendencies, (4) family relations, (5) school relations, (6) community relations. Total personal adjustment is divided into (7) self-reliance, (8) sense of personal worth, (9) sense of personal freedom, (10) feeling of belonging, (11) withdrawing tendencies, and (12) nervous symptoms.

The other test administered to the child groups was the Rosenzweig Picture Frustration Test (PF). This is a projective test which measures reactions to everyday stress. The test consists of a set of 24 pictures, printed four to a page, which require the subject to identify with a figure in the picture who is in a stressful life situation. The child is to reply to the comment made by the other person in the picture. He is instructed to give the first reply that comes to him. All the replies were given verbally and the responses tape recorded. Rosenzweig gives three measures of direction of the child's reaction or "aggression." Aggression toward the outside world is termed "extrapunitivity," toward the inside (or self) is called "intropunitivity," and adaptive behavior is called "impunitivity." Responses were scored along these three dimensions utilizing criteria provided in the test manual. Scoring was done by an independent judge, a

graduate student in educational psychology, blind as to the group membership of the subject. Scoring was randomly checked by a second judge with interjudge reliability found to be 98 percent on the 300 scorings checked.

Statistical Analyses

To test the general hypothesis that children with the speech disorder associated with vocal nodules when compared with functional articulatory disordered children and normal controls will differ significantly on personal adjustment and direction of aggression, four step-wise linear discriminant function analyses (Cooley and Lohnes, 1962) were computed. These were computed to examine the overall differences and the differences among the three possible pairs of groups: VN group and the NC group, the AD group and the VN group, and the AD group and the NC group. The criterion groups in the analyses were the VN group, the AD group, and the NC group. The predictor variables used to differentiate among the three groups were the scores on the personality measures.

A discriminant function was provided for each group by each analysis. This discriminant function was based on a weighting system which maximized the variance between groups while minimizing the variance within groups.

The step-wise discriminant function analysis also indicated the order of selection of the variables in discriminating between the groups. For example, the second variable selected was that one which contributed the most to the prediction system already containing the best single predictor. An F test with $g-1$ and $n-g-p$ d.f. where g

equals the number of groups, n equals the total number of subjects and p equals the number of predictors, was used at each step to determine whether the predictor contributed to accounting for the remaining variance.

After this initial phase of the analysis, those variables which met certain specifications were included in the final "best" prediction system. The criteria by which the final "best" prediction system was chosen were as follows:

1. Since the problem of shrinkage, analogous to that in multiple regression, occurs in this type of analysis, the number of final predictor variables used was limited to the first five variables selected in the initial phase of the analysis. This maximum limit provided a S to predictor ratio of 15:1.
2. An attempt was made to select the final prediction system such that the number of misclassifications was at a minimum and such that the number of the more costly misclassifications was at a minimum.
3. At each step of the initial analysis, an F statistic was computed to test the significance of any variable in the prediction system at that step, given the contribution of the remaining variables in that prediction system. (The significance of any variable can change as other variables are added to the system, so that a variable can discriminate better or worse than it did when it was initially selected.) It seemed desirable that all variables in the final prediction system should be significant at the .10 level.
4. Past results were taken into consideration if a variable was on the border line of being included or not being included (Stewart, 1976, n.p.).

The proportion of S_s statistically assigned to the same group as their original group was computed for each group in each of the analyses. These proportions gave a practical indication of how well the discriminant classification system matched the original diagnoses.

CHAPTER IV

RESULTS

Four step-wise linear discriminant function analyses were computed to assess responses of the three groups of children to the evaluation instruments. These four analyses examined the overall differences in responses and the differences among the three possible pairs of groups: children in the group having the speech disorder associated with vocal nodules (VN) and articulatory disordered children (AD), AD group and the normal control group of children with no vocal handicaps (NC), VN group and NC group. Results are presented separately for the four analyses employed.

Appendix B contains a listing of mean values and standard deviations for each of the three groups on each of the fifteen variables utilized in the analyses. California Test of Personality sub-scales found to be significant are contained in Appendix C.

Analysis I

Vocal Nodule Children, Articulatory Disordered

Children, Normal Control Children

In the overall analyses of all subjects in all groups, three of the fifteen variables proved to be significant predictors of a child's vocal group. The sub-scale of the California Test of Personality (CTP) measuring "family relations" showed a significant difference ($F = 4.17$,

$df = 2/27$, $p < .05$) among the groups. The NC group scores reflected the best adjustment in this area followed by the children with vocal nodules, while the articulatory disordered children showed the poorest adjustment.

In combination with "family relations," the most effective discriminator was the CTP sub-scale of "social skills" ($F = 5.17$, $df = 2/26$, $p < .05$). In this area again the normal group showed the best adjustment followed by subjects in the articulatory disordered group while the children with vocal nodules showed the poorest adjustment.

The third variable effective at discriminating the children as to their vocal group in combination with "family relations" and "social skills" was the CTP sub-scale measure of "sense of personal freedom" ($F = 3.76$, $df = 2/25$, $p < .05$). In this area, the articulatory disordered children showed the best adjustment, followed by the children with vocal nodules while the normal control children showed the poorest adjustment.

By using a combination of the three above-mentioned variables ("family relations," "social skills," "sense of personal freedom"), 70 percent of the children with vocal nodules, 80 percent of the normal control children, and 70 percent of the articulatory disordered children were correctly classified.

Analysis II

Articulatory Disordered Children,

Normal Control Children

The pair-wise discriminant function analysis between the children

with articulation disorders and the normal control children found three variables to be significant in differentiating the two groups. Figure 1 illustrates the groups' standing on these three variables.

The first significant differentiating variable was the CTP sub-scale "family relations" ($F = 6.93$, $df = 1/18$, $p < .05$). In this area the NC group scored as better adjusted than did the AD group.

The next significant variable used in combination with "family relations" was the CTP sub-scale "sense of personal freedom" ($F = 8.90$, $df = 1/17$, $p < .01$). Children in the AD group showed better adjustment than the NC group on this scale.

Used in combination with the above two variables, the CTP sub-scale "withdrawing tendencies" showed significant differences between the groups ($F = 7.67$, $df = 1/16$, $p < .05$). Scores in this area reflected better adjustment on the part of the NC group.

These three variables used in combination correctly classified 90 percent of the NC children and 80 percent of the AD children as to their group.

Analysis III

Vocal Nodule Children, Articulatory

Disordered Children

Two variables were found in this analysis which significantly differentiated children in the VN group from children in the AD group. Figure 2 illustrates the groups' standing on these two variables.

The first significant differentiating variable was the CTP sub-scale "social skills" ($F = 5.23$, $df = 1/18$, $p < .05$). The AD group was found to have significantly better adjustment in this area than the VN

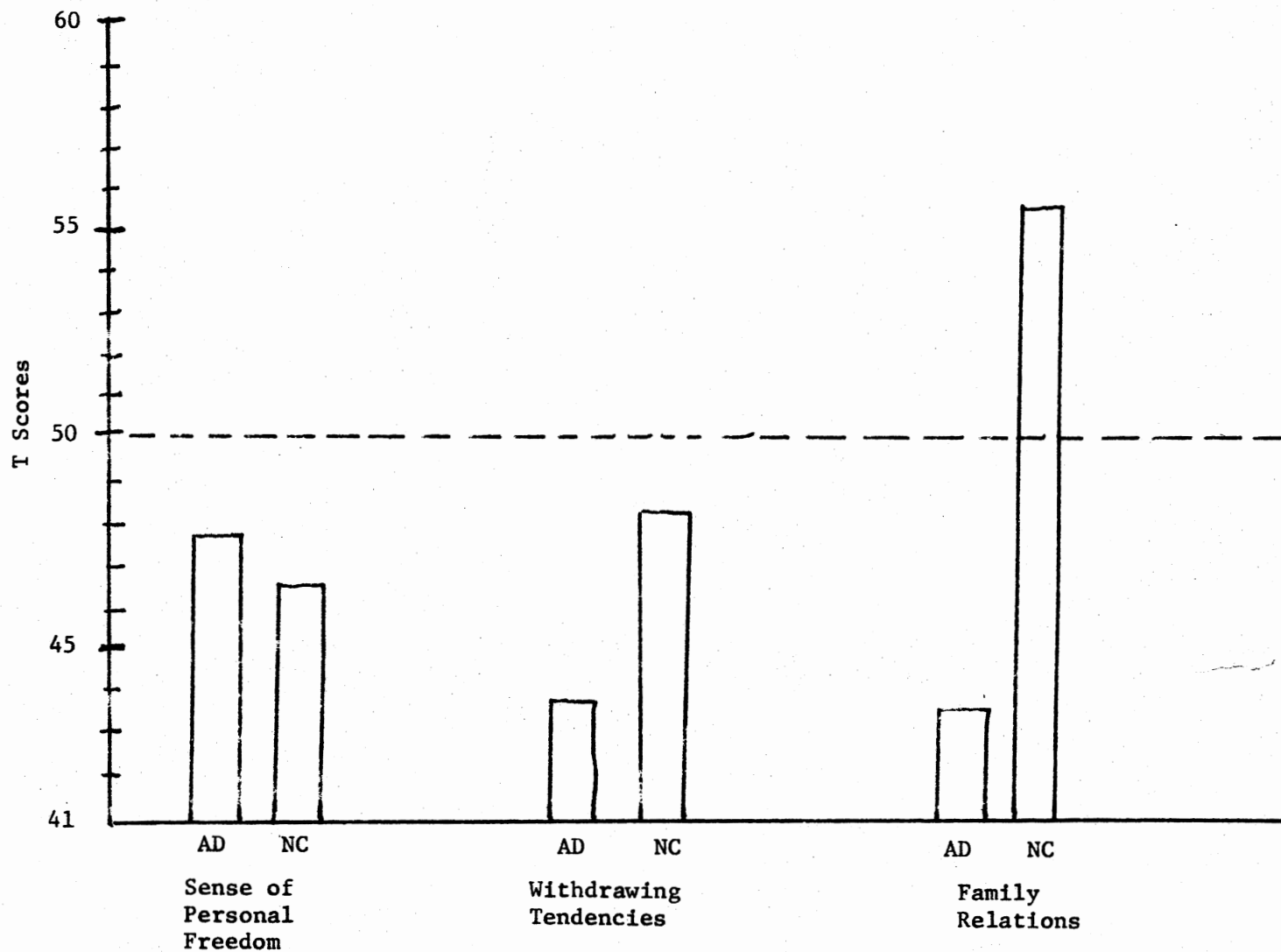


Figure 1. Comparison of AD and NC Children on Significant Differentiating Factors

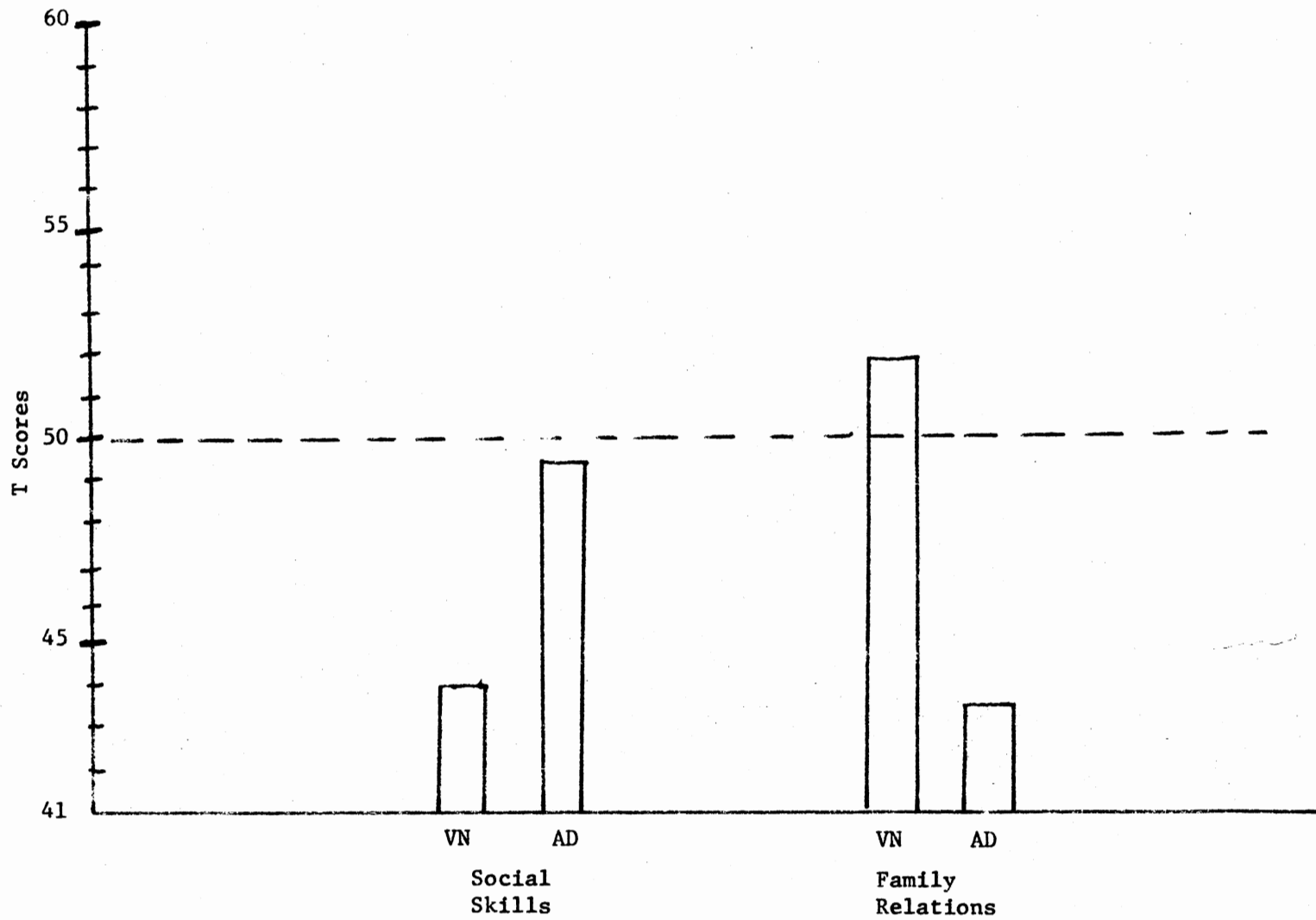


Figure 2. Comparison of VN and AD Children on Significant Differentiating Factors

group.

When used in combination with "social skills" the CTP sub-scale "family relations" was also found to significantly differentiate the two groups ($F = 6.02$, $df = 1/17$, $p < .05$). On this scale the VN group scored as significantly better adjusted than the AD group. These two variables in combination correctly classified 80 percent of both the VN children and the AD children as to their group.

Analysis IV

Vocal Nodule Children, Normal Control

Children

In the pair-wise discriminant function analysis of the VN group and NC group one variable, the CTP sub-scale "social skills" was found to be significant in differentiating the two groups ($F = 8.08$, $df = 1/18$, $p < .05$). This scale showed the NC group to have significantly better social skills than the VN children. Using this variable, 80 percent of the VN children and 70 percent of the NC children were correctly classified into their group.

Looking at the approximations to F at step 0 in this analysis, two variables were found to be significant. In addition to the above-mentioned "social skills," the CTP sub-scale "school relations" was also found to be significant ($F = 4.58$, $df = 1/18$, $p < .05$). Apparently due to its high overlap with social skills, it was not selected as significant in the step-wise procedure.

CHAPTER V

DISCUSSION

This study sought to determine if there were significant differences in the adjustment of children having the speech disorder associated with vocal nodules when compared to children with a different speech disorder and to children with no speech disorder. Professionals in the area of speech have long reported observations of differences in these children with vocal nodules. The following statistical results of this work support those observations and suggest that there are indeed significant differences among the groups.

The area of "social skills" as measured by the California Test of Personality (CTP) was a significant variable in determining to which group the children belonged. In this area the children with the speech disorder associated with vocal nodules showed the poorest adjustment, followed by the articulatory disordered children with the normal control children showing the best adjustment. The "social skills" sub-scale is a measure of liking for people, deference to their wishes, and diplomacy in dealing with others. The CTP authors state that a child who scores well in this area subordinates his or her egoistic tendencies in favor of interest in the problems and activities of his associates. Significantly poorer adjustment by the vocal nodule children in this area would be consistent with studies such as that of Barker and Wilson (1967) which suggest significantly greater misbehavior and vocalization

by these children. Reports of behavior of these children might be said to classify it as the "intrusive" type, therefore it is not surprising these children would not be inclined to "subordinate their egoistic tendencies." Since all of the children with vocal nodules in this study were either the oldest or middle child in their family, one hypothesis would suggest this kind of "intrusive" behavior was used as an attention gaining mechanism by the child as other children came into the family. This would be supported by the informal parental interviews of this study in which parents of vocal nodule children saw that child as louder and more vocal and as the child in the family who "demanded attention."

Another variable in the overall analysis which proved to be significant in differentiating among the three groups of children was the CTP sub-scale "family relations." This area has to do with feelings of being loved and secure at home, with most of the questions directed toward feelings about the parents in this area. On this sub-scale the articulatory disordered children showed the poorest adjustment followed by the children with vocal nodules while the normal control children again showed the best adjustment. Studies dealing with ways in which articulatory disordered children differ emotionally from children without speech handicaps speak of some differences of these children being that they are more fearful (Solomon, 1961; Van Riper, 1963), have greater anxiety and tension (Solomon, Trapp and Evans, 1960; Van Riper, 1963), and as coming from less desirable emotional environments (Andersland, 1961; Moll and Darley, 1960; Wood, 1946). These are all feelings which one might associate with a child who felt less loved and secure at home. It appears, therefore, that there is a consistency between

these studies and the lower score of articulatory disordered children in the area of "family relations." Additionally, seventy percent of the articulatory disordered children tested were youngest or only children. It could be hypothesized that these are more "isolated" birth order positions and might contribute somewhat to lowered feelings of being an integral part of the family.

The third variable in the overall analysis which significantly discriminated among the groups was the CTP sub-scale measure of "sense of personal freedom." On this sub-scale, the normal control subjects scored the lowest, that is, felt less personal freedom. They were followed closely by the children with vocal nodules and the articulatory disordered children. This scale looks at how much freedom parents give their children in various areas. While the results are somewhat perplexing, one explanation would be that parents of speech handicapped children tend to "overcompensate" for the "defective" children and give him/her greater freedoms and privileges than do parents of children who do not have those problems. AD children appear to feel the least closeness to their families of the three groups as evidenced by scores in the "family relations" scale. Perhaps this lack of closeness also gives the AD children the greatest sense of freedom from control.

In addition to "family relations" and "sense of personal freedom," one additional variable assisted in differentiating between these AD and NC children. The CTP sub-scale "withdrawing tendencies" showed the AD children to have greater adjustment problems in this area than did the NC children. According to the CTP authors, these children are more likely to substitute the joys of a fantasy world for actual successes in real life. They also characterize this type of person as "sensitive,

lonely, and given to self-concern." This tendency of the AD child to withdraw would be consistent with findings that children with this disorder are more fearful (Solomon, 1961; Van Riper, 1963) and have greater anxiety and tension (Solomon, 1961; Trapp and Evans, 1960; Van Riper, 1963) than do NC children, that is if they are more fearful, anxious and tense they might be expected to withdraw.

In addition to the "social skills" variable mentioned earlier, the CTP sub-scale "school relations" was also found to be important in differentiating VN and NC children. This was as had been hypothesized. This sub-scale measures in part feelings of the student "that his teachers like him" and he/she "enjoys being with other students." Thinking of the greater misbehavior and vocalization reported for these children (Barker and Wilson, 1967), it is easy to understand why these children might have feelings of not being liked by their teachers and difficulty in being with other students.

In reviewing the two previous studies which dealt with vocal nodule children and their emotional problems, no consistent pattern emerges. While Glassell (1972) found differences between vocal nodule children and normal control children on all of the CTP sub-scales, Engel and Heuer (1975) found a difference on only one of the CTP sub-scales. Neither of the above studies used a second control group of children with a different speech handicap as was used in this study. This additional control group enabled the present study to gain information of a more specific nature. While it did not reflect the overall difference in adjustment of Glassell's (1972) study, the areas of maladjustment it did reveal can be associated more specifically with vocal nodule children

since another group of speech handicapped children were shown to be significantly different from the vocal nodule children in those areas. It also gives an indication of maladjustment of a more specific type since in other areas the speech handicapped control group of articulatory disordered children showed poorer adjustment than did the vocal nodule children, that is, additional information that the two speech handicapped groups' problems are of a somewhat different nature. This information lends support to the idea that vocal nodule children are a population different not only from children without speech handicaps but also from other children with speech problems.

One hypothesis as to the lack of consistency among the Glassell (1972), Engel and Heuer (1975) results and the findings of the present study could be the absence of control for length of time in speech therapy for vocal nodule children. In terms of a positive relationship in a child's life being a potential source for furthering emotional growth, the presence and duration of contact with a speech therapist could be seen as important. Also, children in speech therapy a period of time would have a better opportunity for reduction of their speech handicap thereby making their overt differences from other children smaller. Since this factor was not controlled in these studies, wide variances could be understood. Further work in this area would do well to control for length of time in speech therapy.

Further studies in this area would also gain valuable information by the inclusion of structured interviews with parents and the use of behavior rating scales completed by the parents of these children. This is suggested by informal parental interviews conducted during this study. The parents of vocal nodule children consistently reported

behavior by that child which was different from the behavior of their other children and different from behavior reported by parents of articulatory disordered children and normal control children in this study. Specifically, this behavior of vocal nodule children was a type of verbal hyperactivity consisting of a loud verbalizing which was seen as more frequent and interruptive than that of other children. Based upon these observations by parents of vocal nodule children, the inclusion of parents of these children might well be a part of the remedial program. To implement this, one could utilize parent discussion groups. This means of intervention would minimize the stress on parents by focusing on the child's speech and behavior problems while at the same time giving parents a chance to express their feelings and gain increased parental effectiveness.

Perhaps the most fruitful approach in terms of future study of children with vocal nodules would be studies of the longitudinal type. Upon diagnosis of the speech disorder associated with vocal nodules, the child could be tested for emotional problems, interviews with and ratings by parents, teachers and peers could be obtained thus giving an overall picture of the child before the onset of speech therapy. This approach would have the advantage of an opportunity to study the effectiveness of inclusion of psychologically based approaches to deal with emotional problems discovered in the testing. Motivation for research in this area is the discovery of the most effective combination to benefit the total child, therefore an approach of dual evaluation and remediation seems most appropriate.

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APPENDIXES

APPENDIX A

**CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITY
AND RELEASE OF INFORMATION**

CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITY
AND RELEASE OF INFORMATION

Department of Psychology
Oklahoma State University
Stillwater, Oklahoma

Date: _____

I hereby voluntarily consent to the participation of _____
_____ as a subject in this study con-
(name of child)

cerning factors related to speech disorders. The purpose of this study and data collection procedures have been explained to me. I agree that these procedures do not constitute a violation of my child's personal rights or welfare. However, I am aware that research is not an exact science and I acknowledge that no guarantees have been made to me as to the results of this study.

I further agree that if achievement tests or intelligence tests have been administered to my child, the obtained scores may be made available to the researchers, H. Stephen Caldwell and Jeanne Masters.

I understand that strict confidentiality will be observed of all data collected as a result of my child's participation under the guidelines established by the Public Health Service and the American Psychological Association. Complete anonymity will be preserved and data will be released only to qualified professionals for scientific or training purposes.

This form has been fully explained to me and I certify that I understand its contents.

(Parent or guardian for minor child)

APPENDIX B

**MEANS AND STANDARD DEVIATIONS FOR VOCAL NODULE,
ARTICULATORY DISORDERED AND NORMAL
CONTROL GROUPS**

TABLE I
 MEANS AND STANDARD DEVIATIONS FOR VOCAL NODULE,
 ARTICULATORY DISORDERED AND NORMAL
 CONTROL GROUPS

Variable	VN GROUP		NC GROUP		AD GROUP	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Self-Reliance	45.1	6.7	45.5	11.5	49.0	7.4
Sense of Personal Worth	49.0	11.3	52.5	5.8	48.2	8.3
Sense of Personal Freedom	47.3	4.5	46.5	3.0	47.8	6.3
Feeling of Belonging	47.2	9.2	52.2	6.2	50.1	11.6
Withdrawing Tendencies	40.1	16.5	48.0	10.0	43.8	9.9
Nervous Symptoms	40.7	17.6	42.8	5.4	44.8	8.1
Social Standards	49.1	7.0	53.7	5.6	50.9	6.9
Social Skills	44.0	3.9	50.5	6.1	49.5	6.5
Anti-Social Tendencies	42.0	6.9	48.2	6.6	43.5	9.3
Family Relations	51.1	7.6	55.1	5.1	43.3	13.2
School Relations	47.9	4.7	51.7	6.1	46.5	9.3
Community Relations	46.0	3.1	51.3	7.2	47.5	10.9
Extrapunitive	57.5	24.3	50.8	16.9	59.2	11.0
Intropunitive	15.4	8.2	18.9	8.1	17.9	8.1
Impunitive	27.1	17.5	30.2	15.5	22.9	8.1

APPENDIX C

CALIFORNIA TEST OF PERSONALITY SUB-SCALES

FOUND TO BE SIGNIFICANT

CALIFORNIA TEST OF PERSONALITY SUB-SCALES

FOUND TO BE SIGNIFICANT

Sense of Personal Freedom

1. Do you feel that your folks boss you too much?
2. Are you allowed enough time to play?
3. May you usually bring your friends home when you want to?
4. Do others usually decide to which parties you may go?
5. May you usually do what you want to during your spare time?
6. Are you prevented from doing most of the things you want to?
7. Do your folks often stop you from going around with your friends?
8. Do you have a chance to see many new things?
9. Are you given some spending money?
10. Do your folks stop you from taking short walks with your friends?
11. Are you punished for lots of little things?
12. Do some people try to rule you so much that you don't like it?

Withdrawing Tendencies

1. Have people often been so unfair that you gave up?
2. Would you rather stay away from most parties?
3. Does it make you shy to have everyone look at you when you enter a room?
4. Are you often greatly discouraged about many things that are important to you?
5. Do your friends or your work often make you worry?

6. Is your work often so hard that you stop trying?
7. Are people often so unkind or unfair that it makes you feel bad?
8. Do your friends or classmates often say or do things that hurt your feelings?
9. Do people often try to cheat you or do mean things to you?
10. Are you often with people who have so little interest in you that you feel lonesome?
11. Are your studies or your life so dull that you often think about many other things?
12. Are people often mean or unfair to you?

Social Skills

1. Do you let people know you are right no matter what they say?
2. Do you try games at parties even if you haven't played them before?
3. Do you help new pupils to talk to other children?
4. Does it make you feel angry when you lose in games at parties?
5. Do you usually help other boys and girls have a good time?
6. Is it hard for you to talk to people as soon as you meet them?
7. Do you usually act friendly to people you do not like?
8. Do you often change your plans in order to help people?
9. Do you usually forget the names of people you meet?
10. Do the boys and girls seem to think you are nice to them?
11. Do you usually keep from showing your temper when you are angry?
12. Do you talk to new children at school?

Family Relations

1. Do your folks seem to think that you are just as good as they are?
2. Do you have a hard time because it seems that your folks hardly ever have enough money?

3. Are you unhappy because your folks do not care about the things you like?
4. When your folks make you mind, are they usually nice to you about it?
5. Do your folks often claim that you are not as nice to them as you should be?
6. Do you like both of your parents about the same?
7. Do you feel that your folks fuss at you instead of helping you?
8. Do you sometimes feel like running away from home?
9. Do you try to keep boys and girls away from your home because it isn't as nice as theirs?
10. Does it seem to you that your folks at home often treat you mean?
11. Do you feel that no one at home loves you?
12. Do you feel that too many people at home try to boss you?

School Relations

1. Do you think that the boys and girls at school like you as well as they should?
2. Do you think that the children would be happier if the teacher were not so strict?
3. Is it fun to do nice things for some of the other boys or girls?
4. Is school work so hard that you are afraid you will fail?
5. Do your schoolmates seem to think that you are nice to them?
6. Does it seem to you that some of the teachers "have it in for" pupils?
7. Do many of the children get along with the teacher much better than you do?
8. Would you like to stay home from school a lot if it were right to do so?
9. Are most of the boys and girls at school so bad that you try to stay away from them?

10. Have you found that some of the teachers do not like to be with the boys and girls?
11. Do many of the other boys or girls claim that they play games more fairly than you do?
12. Are the boys and girls at school usually nice to you?

APPENDIX D

**F VALUES AT STEP 0 FOR EACH OF FIFTEEN VARIABLES
TESTED ON EACH OF THE FOUR ANALYSES PERFORMED**

TABLE II
 F VALUES AT STEP 0 FOR EACH OF FIFTEEN VARIABLES
 TESTED ON EACH OF THE FOUR
 ANALYSES PERFORMED

Variable	I VN, NC, AD	II AD, NC	III VN, AD	IV VN, NC
Self-Reliance	0.5960	0.6545	1.5435	0.0090
Sense of Personal Worth	0.6835	1.8086	0.0327	0.7611
Sense of Personal Freedom	0.1884	0.3472	0.0422	0.2210
Feeling of Belonging	0.7380	0.2557	0.3857	2.0507
Withdrawing Tendencies	0.9957	0.8911	0.3695	1.6732
Nervous Symptoms	0.3118	0.4249	0.4482	0.1299
Social Standards	1.2727	1.0066	0.3384	2.6561
Social Skills	3.8866*	0.1266	5.2306*	8.0818*
Anti-Social Tendencies	1.7700	1.7049	0.1678	4.2211
Family Relations	4.1662*	6.9274*	2.6037	1.9053
School Relations	1.4882	2.1756	0.1797	2.4660
Community Relations	1.2388	0.8447	0.1742	4.5790*
Extrapunitive	0.5798	1.6982	0.0395	0.5010
Intropunitive	0.4980	0.0795	0.4750	0.9336
Impunitive	0.6650	1.7654	0.4716	0.1821

* p < 0.05

VITA²

Barbara Masters

Candidate for the Degree of

Master of Science

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