A STUDY OF THE RELATIONSHIP AMONG THREE FILMED TESTS OF VISUAL COMMUNICATION

> Thesis for the Degree of M. A. MICHIGAN STATE UNIVERSITY CAROL E. APEL 1967

THESIS







### RETURNING MATERIALS: Place in book drop to remove this checkout from your record. FINES will be charged if book is returned after the date stamped below.



i

#### A STUDY OF THE RELATIONSHIP AMONG THREE FILMED TESTS OF VISUAL COMMUNICATION

It was the purpose of this study to investigate the relationship among three tests of speechreading ability, and to determine whether these tests could be used to rank-order subjects in similar fashion for use in the clinic or in research. Data related to three areas of concern were collected.

First, the nature of the relationship among the three tests was determined. Secondly, the study was concerned with the significance of differences of means among the tests, and finally the significance of differences between scores as a function of sex was determined.

In order to obtain this data, three specific speechreading tests were selected. The first test selected for the study was the <u>Utley Sentence Test</u>. It was primarily selected because it was standardized, and had a demonstrated correlation with certain other tests. In addition, it had also been consistently used in research since its careful development in 1946. Both forms of the sentence test had a high coefficient of reliability. However, Form A was preferred due to the maximum length of sentences.

The <u>Katt Sentence Test</u> was chosen for it was relatively new and had never been correlated with other similar tests. The two forms of the test were examined and Form B was selected because it was the longer test.

The final test chosen was the <u>Semi-Diagnostic Test</u> <u>for Aural Rehabilitation</u>. Form 1D of this multiple-choice word test was utilized. It was selected for its unique manner of measuring, using isolated words in a multiplechoice word format; its simplicity of administration; and the lack of demonstrated correlation with sentence tests.

The three tests were filmed on sixteen millimeter silent motion picture color film. One female speaker was employed for all three films. These films were shown to three groups of college-age subjects, in a designated order. Each group contained five male and five female normal hearing adult subjects.

Three percent scores were derived for each subject, one for the Utley test, one for the Katt test, and one for the Semi-Diagnostic test. To determine the relationship among the tests, the scores were compared by means of the <u>Pearson Product-Moment Correlation</u>. A <u>t</u> test was used to determine the comparative difficulty of each test. The significant difference in scores as a function of sex was demonstrated by a <u>t</u> test. The correlational relationship existing between the Utley and Katt tests was 0.78. The correlation between the Semi-Diagnostic test and the Utley test was 0.56, and the correlation between the Semi-Ciagnostic and the Katt test was 0.45. The analysis revealed that the Katt test was the most difficult of the three tests; the Utley and Semi-Diagnostic tests were equal in difficulty. The statistical analysis also indicated that the female subjects' test scores were significantly higher than the male subjects' test scores.

It was therefore concluded that the Katt and Utley tests may well be used interchangeably since they tend to rank-order subjects in similar fashion. It was also concluded that there was a lower relationship existing between the Semi-Diagnostic test and either the Katt or the Utley test.

### A STUDY OF THE RELATIONSHIP AMONG THREE FILMED TESTS OF VISUAL COMMUNICATION

By

Carol E. Apel

### A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

College of Communication Arts Department of Speech

FILLI 9

# TABLE OF CONTENTS

# LIST OF TABLES

Page v

# Chapter

# I. STATEMENT OF PROBLEM

	Introduction1Statement of Problem3Questions Posed at Onset4Importance of the Study4Definition of Terms5Organization of the Thesis6
II.	REVIEW OF THE LITERATURE
	Importance of Speechreading
	Speechreading Ability       9         The Utley Film Test       14         The Katt Filmed Tests       13         The Semi-Diagnostic Test for       13
III.	Aural Rehabilitation 20 EQUIPMENT, SUBJECTS, AND FROCEDURES
	Naterials
IV.	RESULTS AND DISCUSSION
	Relationship Among Tests
v.	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS
	Summary

AFFENDIX	A	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	45
APPENDIX	R	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	47
APPENDIX	С	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	49
APPENDIX	D	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	51
BIBLIOGRA	APH	ΙY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	53

# LIST OF TABLES

TABLES

1.	Means and Standard Deviations for the Utley, Katt and Semi-Diagnostic tests de- rived from the scores of thirty normal hearing subjects	35
2.	Pearson's Froduct Moment correlations for the Utley, Katt and Semi-Diagnostic tests based on the data from a group of thirty normal hearing subjects	<b>3</b> 6

Fage

v

# CHAPTER I STATEMENT OF THE PROBLEM

#### Introduction

A person with a loss of hearing may take several courses of action to aid himself in rehabilitation for more effective communication. One course of action may be the utilization of a hearing aid. On the other hand, with more severe losses or complications, speech training and speechreading may be required. Whatever avenues of assistance are offered, the eyes become an important avenue of information and will play a part in determining the eventual success or failure in maintaining communication.

The phenomenon of speechreading, "hearing with the eyes," is not yet completely understood, though its value and importance have long been accepted. As early as the sixteenth century speechreading training was offered on a limited and experimental basis.<sup>1</sup> In the ensuing centuries the teachers of speechreading have come from various vocations, to the present time when specialized personnel handle this particular aspect of rehabilitation of the hearing handicapped.

The development of formal speechreading materials has been a recent innovation, with many factors still to be ex-

<sup>&</sup>lt;sup>1</sup>John J. O'Neill and Herbert J. Oyer, <u>Visual Communi-</u> <u>cation for the Hard of Hearing: History, Research, and Methods</u> (Englewood Cliff, New Jersey: Prentice-Hall, Inc., 1961), p. 10.

plored, modified and tested. The need was felt so strongly by the leaders in this field that many people devised their own materials. It became apparent that some sort of evaluation system was needed to measure progress of the student, to classify new students, and to determine the effectiveness of the speaker. At first therapists developed their own tests, quite often drawing from their own stock of materials. The next step was the natural combining of forces to strengthen knowledge and effectiveness of testing and training materials. Many of these leaders began to research the problem involved.

The desirability of speechreading tests was not questioned, though there is more than one important use for such tests. First and foremost, "they measure the basic lipreading ability of an individual."<sup>2</sup> They can also be employed to "measure the effects of lipreading training, . . . aid in the proper placement of individuals within a training program, . . . help in deciding which teaching methods, or combination of methods, are most appropriate for students of various age and performance levels, . . . and can indicate the visual intelligibility of individual speakers."<sup>3</sup>

A speechreading test is a highly specialized educational instrument which can be administered in either a live face-to-face fashion or by silent motion picture film. The materials employed vary from isolated consonants, vowels, nonsense syllables or single words to phrases, sentences, para-

<sup>&</sup>lt;sup>2</sup><u>Ibid</u>., p. 20. <sup>3</sup><u>Ibid</u>., p. 21.

graphs, and situational skits. One or more speakers may be used, as in the situational skits. Each type of test has its own merits and place of importance in the development and evaluation of speechreading skills.

# Statement of Problem

It was the purpose of this study to investigate the relationship among three tests of speechreading ability, determining whether these tests could be used interchangeably. The problem of test reliability has been investigated for each of the tests selected in this study, but no attempt has been made to determine if these tests do measure the same ability.

The first test selected for this study was the <u>Utley</u> <u>Sentence Test</u>, Form A.<sup>4</sup> This test has been consistently used in research, has been carefully developed, is standardized, and has a demonstrated correlation with certain other tests. The Katt Test, Form B,<sup>5</sup> also a sentence test, is relatively new and has never been correlated with other speechreading tests. The final test chosen was the <u>Semi-Diagnostic Test in</u> <u>Aural Rehabilitation</u>, Form 1D.<sup>6</sup> It was selected for (1) its unique manner of measuring, using isolated words in a

<sup>4</sup>Jean Utley, "A Test of Lipreading Ability," <u>Journal</u> of <u>Speech and Hearing Disorders</u>, XI (May, 1946), pp. 109-111.

<sup>5</sup>Interview with T. Katt, December, 1965.

<sup>6</sup>Charles Hutton, E. Thayer Curry, and Mary Beth Armstrong, "Semi-Diagnostic Test Materials for Aural Rehabilitation," <u>Journal of Speech and Hearing Disorders</u>, XXIV (November, 1959), p. 319.

multiple-choice word format, (2) its simplicity of administration, and (3) the lack of demonstrated correlation with sentence tests.

#### Questions Posed at Onset

The questions posed at the beginning of this study were as follows:

- What is the statistical relationship existing between the Utley sentence test, Form A, and the Katt test, Form B?
- 2. What is the statistical relationship existing between the Utley sentence test, Form A, and the Semi-Diagnostic test, Form 1D?
- 3. What is the statistical relationship existing between the Katt test, Form B, and the Semi-Diagnostic test, Form 1D?
- 4. Is there a significant difference in mean scores obtained on the Utley and Katt tests?
- 5. Is there a significant difference in mean scores obtained on the Utley and Semi-Diagnostic tests?
- 6. Is there a significant difference in mean scores obtained on the Katt and Semi-Diagnostic tests?
- 7. Is there a significant difference in mean scores across the three tests, obtained from males and females?

# Importance of the Study

Correlated tests can be an asset in measurement. Such tests allow for a wider range of material used in evaluating



an individual's status in speechreading development. A test of speechreading ability may well prove to be more valuable and versatile when compared to other similar tests. It is important to know whether one test can be used to rank-order subjects in similar fashion to another test, and whether two dissimilar tests in terms of content and format can function in a complementary manner. In addition, when evaluation is necessary, advantage lies in having several tests to select from, knowing that they yield correlated scores.

The merits of the Utley test are better known than the others; but if performance on that test is correlated highly with either the Katt or Semi-Diagnostic test, then more data would be available to evaluate a subject's performance.

This present study, therefore, investigates speechreading ability when the Utley, Katt and Semi-Diagnostic tests are the tools of measurement. Correlations can then be established from subjects' scores. Useful information is gained, and the scores of each test in the clinical situation become more meaningful.

### Definition of Terms

For the purpose of this study, the terms used are defined in the following manner:

<u>Speechreading</u>. -- The understanding of speech through visual means when the reader is denied any acoustical components of the oral symbol or situational cues.

<u>Filmed tests</u>. -- Sixteen millimeter color silent motion picture film.

<u>Utley Sentence Test, Form A</u>. -- A list of thirty-one sentences, ranging from two to six words in length, designed to test visual discrimination ability and indicate the degree of speechreading ability the client possesses. This test will be referred to as the Utley test.

<u>Katt Sentence Test, Form B</u>. -- A list of sixteen sentences, ranging in length from two to six words, designed to test visual discrimination ability and indicate the degree of speechreading ability the client possesses. This test will be referred to as the Katt test.

Semi-Diagnostic Test in Aural Rehabilitation, Form 1D. -- A multiple-choice test of fifty monosyllabic words designed to test auditory, visual and combined auditoryvisual discrimination ability and to indicate the type of speech sounds the client has difficulty recognizing.<sup>7</sup> The Semi-Diagnostic test will only be used as a visual test in this study. This test will be referred to as the Semi-Diagnostic test.

### Organization of the Thesis

Chapter I has contained the statement of the problem which led to this study and the purpose for which it has been conducted. It has included an introduction to the topic and stated the questions to be discussed. The importance of the study has been discussed and the terms which will be used have been defined.

Chapter II will contain a review of the literature

<sup>7</sup>Hutton, Curry, and Armstrong, <u>op</u>. <u>cit.</u>, <u>p</u>. 319.

which pertains to this topic.

Chapter III will consist of a discussion of the subjects, equipment, filming, testing, and scoring procedures employed in this study.

Chapter IV will contain a discussion of the results of the study.

Chapter V will consist of the summary, conclusions, and recommendations of the study.

#### CHAPTER II

#### REVIEW OF THE LITERATURE

### Importance of Speechreading

To communicate effectively one must be able to both send and receive thought concepts. When a handlcap interferes with either process, communication exchange is hindered, thus isolating the individual to some extent from his fellow man. Either correction or of compensation for the handicap is necessary for maintaining communication. In the event of a handicap in auditory reception, several alternative avenues of stimuli reception are available. Advantage must be taken of visual clues, when hearing is impaired, as a complementary avenue of reception. Adequate training is needed to develop this skill, and the eyes are to assume additional responsibility. An integral part of aural rehabilitation is speechreading. This is the skill of directing visual attention to the speaker as a means of understanding his communication. This technique is difficult to master for only one-third of the speech sounds are highly visible. The methods of achieving some proficiency in speechreading are numerous, but all demand useful tests of measurement to parallel training efforts.

<sup>&</sup>lt;sup>1</sup>Miriam Pauls, "Speech Reading," <u>Hearing and Deafness</u>, revised edition by Hallowell Davis and S. R. Silverman (New York: Holt, Rinehart and Winston, Inc., 1960), p. 355.



Use of the Film to Measure Speechreading Ability

Careful consideration must be given to the measurement of speechreading since speechreading is an integral part of aural rehabilitation for the hearing impaired individual. The development of tests for speechreading ability has been challenged by the lack of knowledge of what constitutes the factors involved in speechreading. Literature in this field reveals several studies concerned with determining what factors are involved in the skill of speechreading. These factors which determine the validity of a speechreading test have yet to be discovered. Therefore, "the testing instrument itself becomes the only method of ascertaining the lipreading skill of an individual."<sup>2</sup>

Studies have been conducted to look into relationships between this skill and indices of age (mental and chronological), sex, intelligence, education, language and reading ability, synthetic ability, and the perception of color and form.<sup>3</sup> The findings vary from test to test and range from no relationship to statistically significant.

The importance of speechreading tests, however, is recognized as outlined by O'Neill and Oyer.<sup>4</sup> Tests can be used as a tool to measure basic ability, the effects of

<sup>4</sup>0'Neill and Oyer, <u>op</u>. <u>cit.</u>, p. 21.

<sup>&</sup>lt;sup>2</sup>John J. O'Neill and Mary C. Stephens, "Relationships Among Three Filmed Lipreading Tests," <u>Journal of Speech and</u> <u>Hearing Research</u>, II (March, 1959), p. 61.

<sup>&</sup>lt;sup>3</sup>Audrey Ann Simmons, "Factors Related to Lipreading," Journal of Speech and Hearing Research, II (December, 1959), p. 344.

training, and the intelligibility of the speaker.<sup>5</sup> Tests can be an aid to placement in a training program and to decide which method or methods are best suited to the student speechreader.<sup>6</sup>

Although tests of speechreading ability are important, not all tests are equally valuable. The construction of a test is important in determining its value. Ideally the main factors to be considered in designing a test of speechreading ability are "(1) population to be tested, (2) format of the test, (3) selection of speakers, (4) selection of test items, (5) conditions under which the test will be given, (6) scoring procedure to be employed."<sup>7</sup>

These six factors should be considered in the development of any type of speechreading test, whether it be administered "live" in a face-to-face situation or by silent motion picture film. Since the latter method (the silent motion picture film test) was used in this study, review of its historical development is desirable.

The first attempt to assess the speechreading ability of the aurally handicapped was that of Nitchie, in 1913.<sup>8</sup> He constructed a filmed test using three proverbs. It wasn't until 1940, twenty-seven years later, at the Clarke School for the Deaf, that Heider and Heider constructed three films

> <sup>5</sup><u>Ibid.</u>, p. 21. <sup>6</sup><u>Ibid.</u>, pp. 20-21. <sup>7</sup><u>Ibid.</u>, p. 30. <sup>8</sup><u>Ibid.</u>, p. 22.

to measure achievement of speechreading ability. The test material of the first films consisted of unrelated nouns, phonetic combinations, animal names and sentences. A revision of the first two films including two stories and eliminating the animal names, constituted the third film. The three films were tested on a total of 247 subjects varying in age from seven to nineteen years.<sup>9</sup> The Heiders determined correlations between Test II and Test III, using the same subjects over a five year experiment of retesting.

The first test to be scored objectively was developed by Mason at Ohio State University in 1942. In all, Mason developed five training films, a five-word test for pre-schoolers, and an additional ten-word test. The last two tests were developed for use in obtaining norms.<sup>10</sup>

Three years later, Naval Training films and short sections of commercial motion picture films were employed by Pauls to measure the progress in training of adults.<sup>11</sup>

By 1946, Utley<sup>12</sup> announced the development of <u>How</u> <u>Well Can You Read Lips?</u>. a filmed achievement test that was standardized. The entire film consisted of seventy-two words,

<sup>9</sup>F. K. Heider and G. M. Heider, "Studies in the Psychology of the Deaf," <u>Psychological Monographs</u>, LII (1940), p. 129.

<sup>10</sup>Marie K. Mason, "A Cinematographic Technique for Testing Visual Speech Comprehension," <u>Journal of Speech and</u> <u>Hearing Disorders</u>, IIX (May, 1943), pp. 273-75.

11 Pauls, <u>op</u>. <u>cit</u>., p. 357.

12Utley, op. cit., pp. 109-111.

sixty-two sentences and a story test. The story section of the test was the first to be in technicolor. Norms were established for the entire test based on total scores. A table of percentage ranks made it possible to use a person's raw score to determine progress in speechreading upon retest.<sup>13</sup> A more complete description and analysis of the Utley test will be included separately.

A more complicated film was constructed by Reid.<sup>14</sup> It consisted of three forms with five parts to each form. Vowels and diphthongs, consonants, unrelated sentences, related sentences and a short story comprised the five parts. One of Reid's objectives was to determine whether the speaker's background or accent affected speechreading ability. The results indicated that there was little relationship between these two factors. Reid also concluded that the ability to speechread is predictable from the length of the training in speechreading, the subject's mental age, his intelligence quotient, and the grade status.

Additional films have been developed by Morkovin and Moore,<sup>15</sup> Lowell,<sup>16</sup> and Moser, <u>et al.</u><sup>17</sup> Kelly developed a

13<u>Ibid</u>., p. 114.

<sup>14</sup>Gladys Reid, "A Preliminary Investigation in the Testing of Lipreading Achievement," <u>Journal of Speech and</u> <u>Hearing Disorders</u>, XII (February, 1947), p. 81.

<sup>15</sup>B. V. Morkovin and L. M. Moore, <u>A Contextual Systematic Approach for Speech Reading</u> (Los Angeles: University of Southern California, 1948-49.

<sup>16</sup>Edgar Lowell, "New Insight into Lipreading," <u>Re-</u> <u>habilitation Record</u>, II (July-August, 1961), p. 4.

170'Neill and Oyer, <u>op</u>. <u>cit</u>., p. 28.

test, part of which was labeled, "Words Out of Contest," This section was a multiple-choice word list, considered unusual in its time.<sup>18</sup>

Another test employing multiple-choice word lists is that devised by Hutton, Curry and Armstrong. This test, called the <u>Semi-Diagnostic Test in Aural Rehabilitation</u>, was constructed to evaluate auditory, visual, and combined auditory-visual discrimination ability. There are six equivalent forms of this test.<sup>19</sup>

A new test, containing two parts, each with sixteen sentences, was constructed by Katt.<sup>20</sup> Although extensive effort was spent in its development, it has never been compared to other tests. This test and the previously mentioned one will be dealt with more completely.

Since the advent of the Nitchie film, a half century ago, films for testing speechreading ability have undergone numerous changes. The concise review of the literature credits a select few of those responsible for the progress and advancements in this area and offers only a limited scope of the possibilities of material and methods available in filmed tests of speechreading ability. Of the many such tests mentioned above, three were chosen for evaluation in this study.

<sup>13</sup><u>Ibid</u>., p. 27.
<sup>19</sup>Hutton, Curry and Armstrong, <u>op</u>. <u>cit</u>.
<sup>20</sup>Katt, <u>op</u>. <u>cit</u>.

#### The Utley Film Test

Up to the time of the development of the Utley film, there was no standardized achievement test of speechreading ability. Usually an individual's ability was judged subjectively by teachers or others. The need for a test was apparent. The major question which stimulated development of the Utley test was, "Is it possible to construct a reliable and valid test of lip reading ability having a sufficiently wide range of items to measure lip reading ability of individuals from three to adult level?"<sup>21</sup>

To answer this question a trial test was constructed for pilot experimentation. It was decided that the test would include words, sentences and groups of related sentences. By extracting every tenth word from the first 1000 most frequently used words as listed by Thorndike, a 100-word list was compiled. "No attempt was made to provide for a balance of speech elements in the words."<sup>22</sup> The sentence test consisted of ten trial sentences, fifty common expressions, and twenty idiomatic sentences. This test was administered to 200 normal hearing subjects of various grade levels. The results were that everyone achieved a score, no one achieved a perfect score, and that scores increased as maturity increased.

The test items were then categorically arranged in scale of difficulty. One test was formed by combining the

<sup>21</sup>Utley, <u>op</u>. <u>cit</u>., p. 109. <sup>22</sup><u>Ibid</u>., p. 110.

common expressions and idiomatic sentences. This revised test consisted of 100 words and 70 sentences. It was administered to 110 deaf and hard of hearing students.

Two methods of scoring, by correct idea and by number of words correctly recorded, were performed on the tests of both subject groups. Correlations of .98 and .97 between the two methods of scoring, indicated the more objective method, number of words correct, could be used.<sup>23</sup>

On the basis of results of the hearing handicapped subjects' ability, statistical item-analyses were made to determine which words or sentences contributed to obtaining scores on the test. The test was thereby shortened to 62 sentences and 72 words, as the most difficult and the easiest items were eliminated.

The words and sentences were each divided into two lists by the odd-even technique, and a coefficient of reliability for sentences of .83, and for words of .84 were obtained. Thus Forms A and B were constructed for both the sentence test and the word test with a reasonable degree of internal consistency. A story test, carefully constructed of six short stories each followed by five questions, was added to the entire test.

The sentence and word sections of the test were filmed on sixteen millimeter black and white film, while the story section was done in Kodachrome color. Insertion of blank film allowed fifteen seconds between sentences and ten

<sup>&</sup>lt;sup>23</sup><u>Ibid.</u>, p. 111.

seconds between each word. The filmed test was shown to 761 deaf and hard of hearing individuals between the ages of eight and twenty-one. The criterion for selection of the subjects was a third-grade reading ability. With the addition of directions for taking each major part of the test, the entire film took one hour and fifteen minutes to administer.

The coefficient of correlation between Form A and B of the sentence test was .866, for the word test .563. The 'corrected' reliability for the entire word test was .797, for the entire sentence test, .928; the reliability of the entire test was .943. The index of reliability was .971.<sup>24</sup> Based on total scores, the norms were made available for the entire test.

From these findings, Utley concluded that the ability to speechread words, sentences and stories was interrelated, that speechreading ability could not be predicted from chronological age or grade placement.<sup>25</sup>

Following the publication of the Utley test, various researchers took it upon themselves to test or challenge the Utley findings. Others used the Utley test for comparative purposes. Brannon compared the Utley sentence test to speechreading spondee and PB word in order to provide clinicians with usable information concerning these materials.<sup>26</sup>

<sup>24</sup><u>Ibid</u>., pp. 113-114, 116.

<sup>25</sup><u>Ibid.</u>, p. 114.

<sup>26</sup>J. B. Brannon, "Speech Reading of Various Speech Materials," <u>Journal of Speech and Hearing Disorders</u>, XXVI (November, 1961).

Byers and Lieberman<sup>27</sup> selected the Utley Sentence Tests I and II for their high reliability and validity to determine the effects of rate of speaker on speechreading performance. Based on the DiCarlo and Kataja research, the sentences were spoken with an expressionless face, only head and shoulders were viewed, and make-up, including lip rouge, was not used. They had criticized the Utley film "for the distraction caused by the arm movements and the make-up of the speaker."<sup>28</sup>

An analysis of the Utley film was performed by DiCarlo and Kataja.<sup>29</sup> Among the criticisms offered was the fact that the sentence test is reduced to a word test by the scoring procedure. In addition the lack of situational clues in all forms of the test, the failure to consider the psychology of the hearing handicapped, that the stories appeared inadequate for purposes intended, that the tests did not discriminate between inexperienced and practiced speechreaders, . . . "that the test seems to be one which tests the ability to tolerate frustration and persistent failure," were the most severe criticisms made in the study.<sup>30</sup>

The Mason, Utley, and Morkovin films were compared by

<sup>27</sup>Vincent W. Byers, and L. Lieberman, "Lipreading Performance and the Rate of the Speaker," <u>Journal of Speech and</u> <u>Hearing Research</u>, II (September, 1959).

<sup>28</sup>Ibid., p. 272.

<sup>29</sup>Louis M. DiCarlo and Raymond Kataja, "An Analysis of the Utley Lipreading Test," <u>Journal of Speech and Hearing</u> <u>Disorders</u>, XVI (August, 1951), p. 238.

<sup>30</sup><u>Ibid.</u>, p. 240.

O'Neill and Stephens to determine whether all three tests measured the same abilities. The results indicate that some significance in similarities did occur.<sup>31</sup> Simmons compared the Utley and Mason films, concluding that "these filmed tests do measure something related to lipreading ability but that the something is only a part of the general ability that can be scored in a face-to-face situation."<sup>32</sup> The Utley test has been used in determining relationships of speechreading ability and such other areas as intelligence, auditory memory span, slow speech, age, ability to interpret incomplete patterns of speech. and numerous other abilities.

### The Katt Filmed Tests

In 1963, Katt began developing a sentence test of speechreading ability to be used for research purposes. He followed the outline of test construction suggested by O'Neill and Oyer.<sup>33</sup> Initially, 300 sentences were collected and tested on fifty subjects of junior high school age. Fifty of the sentences were contributed by a committee of graduate students, the remaining 250 were selected from an English book used at the junior high level.<sup>34</sup> The test was delivered by two speakers in a live face-to-face situation. The sentences were then scored by averaging the total percent of correct

310'Neill and Stephens, op. cit.

<sup>32</sup>Simmons, <u>op</u>. <u>cit</u>., p. 343.

330'Neill and Oyer, op. cit., pp. 30-33.

<sup>34</sup>Follach, Sheridan and Williams, <u>Our English Language</u> (New York: Macmillan Company, 1961).

words.

The item difficulty was determined and the most difficult and the easiest sentences were eliminated. By this process, thirty-two sentences were selected. The revised test was then administered to college students. The test was then divided into two parts by regrouping the thirty-two sentences on the basis of difficulty then randomly selecting from each group. The two tests were administered live by one female and one male speaker. The two speakers took alternating turns in presenting the two tests, so that both forms were tested as one form. The correlation between the two forms was .35.<sup>36</sup>

A comparison of "live" presentation to eight millimeter black and white silent film of both tests was undertaken. Two speakers delivered the tests to fifty-seven normal hearing college students. Half of the test, Form A was filmed, the other half, Form B was presented live. A correlation of .85 was found between the two methods of presentation, with a combined correlation of .92. The obtained mean scores were .53 for Test A and .50 for Test B when delivered live. The standard deviations were .13 and .14 respectively.<sup>37</sup>

The test has also been used with the mentally retarded in another study. The results indicated that speechreading ability is correlated with the intelligence quotient of the

> <sup>35</sup>Katt, <u>op</u>. <u>cit</u>. <sup>36</sup><u>Ibid</u>. <sup>37</sup>Ibid.

mentally retarded.<sup>38</sup> The test, now divided into the two forms, Test A and Test B, has never been compared to any similar test.

#### The Semi-Diagnostic Test for Aural Rehabilitation

There has been considerable interest in multiplechoice word lists designed to measure auditory, visual and combined auditory-visual intelligibility. . . The construction of the materials rose from the need for a systematic method of analyzing the intelligibility errors of hard of hearing clients as a way of paralleling the 'phonetic analysis' commonly used in speech correction. The results of the error analysis would be used to form, in part, the basis of the therapy program. Retesting after therapy would show not only the amount but also the kinds of improvement.<sup>39</sup>

This statement explains the purpose of the tests developed by Hutton, Curry and Armstrong. The general formet of multiple-choice response was suitable for the rapid and convenient analysis of errors desired. The first test, devised in 1956, consisted of 71 consonant and 33 vowel discriminating items. For each test item, four possible answers seemed the most practical. The multiple-choice answers varied by one phoneme only. Thus, errors could be determined. The distribution of phonetic occurrences was founded on French, Carter, and Koenig, and Travis and

<sup>39</sup>Hutton, Curry and Armstrong, <u>op</u>. <u>cit.</u>, p. 319.

<sup>&</sup>lt;sup>38</sup>Richard Smith, "An Investigation of the Relationship Between the Lipreading Ability and Intelligence of the Mentally Retarded." (unpublished Master's thesis, Department of Speech, Michigan State University, 1964).

Voelker research. 40

The first test was administered to twenty-five sural rehabilitation clients over a two-year period. "The results indicated that subjects varied considerably in their respective error distributions and indicated the kind and amount of improvement following therapy. . . . "41 Some difficulty appeared with certain unfamiliar words indicating some influence on error distribution. For that reason, in the 1958 revision, criteria for selecting words were developed. In addition, the number of items was limited to fifty, and two words were presented in a series to reduce administration time.

The revision was tested and analyzed to eliminate or replace poor test and answer items. Each list now contained eighteen vowel and thirty-two consonant items and was labeled the 1959 revision. Altogether, six forms of the test were created by randomly selecting items from 200 words. The test was administered as an auditory discrimination test to twentyfour normal hearing college students and later to a group of hard of hearing subjects. Though the authors discuss the results of this experiment with the auditory section, little mention is made of the results on the visual section of the test and its use as an indicator of speechreading ability.

Further experimentation was done with thirty hard of hearing subjects classified as either conductive loss, mixed

<sup>40</sup><u>Ibid</u>., p. 32. <sup>41</sup><u>Ibid</u>.

loss, or cochlear-nerve loss.<sup>42</sup> The results on all three types of tests -- auditory, visual, and auditory-visual combined -indicated low response to the visual stimuli alone. It was suggested by the authors that a negative attitude toward the speechreading section of the test may have contributed to the low reliability of .31 as compared to .98 for the auditory section.<sup>43</sup> The visual section was not controlled for rate of speech, movement or articulation, as it was presented "live;" this, too, may have added to the low reliability.

Use of the test to aid in therapy is distinctive in that the hard of hearing individual's rehabilitation program depends upon his diagnostic results. All of the samples employed during the authors' research were small and relatively heterogeneous. No norms were established or suggested.

Additional studies of this test have evolved. One prominent study was that of Jynn to establish speechreading norms for age, educational level and sex.<sup>44</sup> An eight millimeter color film presentation was administered to a large sample of grade school children, thus developing norms for a particular population. The other studies have not been concerned specifically with a comparison of the visual section of the test to other speechreading ability tests. This present

> <sup>42</sup><u>Ibid</u>., p. 326. <sup>43</sup><u>Ibid</u>., p. 327.

<sup>44</sup>Margaret Wynn, "Norms for a Film Presentation of the 1959 Revision of the Semi-Diagnostic Test in Aural Rehabilitation." (unpublished Master's thesis, Department of Speech, Michigan State University, 1964).

study will attempt to compare this test with the Utley and Katt tests.

The importance of speechreading as an integral part of aural rehabilitation for the hearing handicapped is an accepted fact. The methods of achieving some proficiency in speechreading are numerous, but all demand useful tests of measurement to parallel training efforts. Such tests can be either of a "live" face-to-face nature or filmed. The type of test material may vary from single words to short stories. The response required in the test may be oral, written or following directions given. Whatever the lest, the more uses it may have, the more beneficial it will become to those using it. The more knowledge concerning the possibilities of the test instrument, the more valuable the instrument will Through such research of tests, some training films, become. for example, have demonstrated the potential of being adequately used as testing films. If it can be determined that several tests do measure the same ability in speechreading, then these tests may well be used interchangeably. It is to this purpose that the three tests -- the Utley, the Katt and the Semi-Diagnostic -- will be compored.

### CHAFTER III

#### SUBJECTS, EQUIPMENT, AND PROCEDURES

#### Materials

Three speechreading tests were filmed for use in this study: the Utley sentence test, Form A; the Katt sentence test, Form B; and the Semi-Diagnostic Test in Aural Rehabilitation, Form 1D.

In selecting the tests to be filmed, both Form A and B of the Utley sentence tests were considered. A correlation of .866 was demonstrated between the two forms, thus eliminating correlation as a variable of selection.<sup>1</sup> The number of total words was equal for both forms; however, Form B had a maximum of ten words per sentence and Form A only six words per sentence. Form A was therefore more similar in structure than Form B to either form of the Katt test. Two sentences were selected from Form B to serve as practice sentences for the Utley film.

The second film was the Katt test, Form B. Again, both Forms A and B were highly correlated at .85; therefore, the selection was determined by the total number of words and the maximum length of sentences.<sup>2</sup> Both forms were equal in

> <sup>1</sup>Utley, <u>op</u>. <u>c1t</u>., p. 113. <sup>2</sup>Katt, <u>op</u>. <u>c1t</u>.

maximum number of words per sentence, six; however, Form B had two more words in total than Form A and was therefore selected for filming. The two practice sentences were taken from Form A.

Form 1D of the Semi-Diagnostic test was randomly selected for use. All six forms were equal in length and type of word groups and showed high correlations among themselves. The two practice words were taken from Form 1A.

Following are the actual lists of practice and test sentences employed in the Utley, Katt and Semi-Diagnostic films:

#### UTLEY LIPREADING TEST, FORM A

Practice sentences: A. How old are you? B. What did you say?

Test sentences:

All right. 1. 2. Where have you been? 3. I have forgotten. 4. I have nothing. 5. That is right. 6. Look out. 7. How have you been? 8. I don't know if I can. How tall are you? 9. 10. It is awfully cold. 11. My folks are home. 12. How much was it? 13. Good night. 14. Where are you going? 15. Excuse me. 16. Did you have a good time? 17. What did you want? 18. How much do you weigh? 19. I cannot stand him. 20. She was home last week. 21. Keep your eye on the ball. 22. I cannot remember. 23. Of course. 24. I flew to Washington. 25. You look well.

26. The train runs every hour. 27. You had better go slow. 28. It says that in the book. 29. We got home at six o'clock. 30. We drove to the country. 31. How much rain fell? KATT TEST. FORM B Practice sentences: A. The dogs barked. B. Come with me. Test sentences: 1. I cannot find him. 2. She looks lovely. 3. My salary is low. 4. How fast will the car go? 5. Mary had a little lamb. 6. I shall tell. 7. I like pumpkin pie. 8. The child was crying. 9. Birds fly south for the winter. 10. I am boastful. 11. He swam a mile. 12. His answers were foolish. 13. Mop the floor. 14. Have I ever met you before? 15. What time is it? 16. 0 boy!

SEMI-DIAGNOSTIC TEST, FORM 1D"

Practice	items:	A.	lad	add
		Β.	ice	been

Test items:

0 10	5 m S •	
l.	night	led
2.	seen	some
3.	wing	same
4.	vote	he
5.	played	burn
6.	bear	pie
7.	f111	sit
8.	far	day
9.	pool	fur
10.	won	with
11.	wide	wife
12.	yet	cat
13.	nut	eyes
14.	tea	row

\*Refer to Appendix D for full test materials.

15.	wood	change
16.	ten	pain
17.	lay	seek
18.	an	then
19.	will	knee
20.	cool	cut
21.	luck	it
22.	lies	place
23.	like	bowl
24.	did	lad
25.	eat	men

### Filming

All three tests were filmed under identical conditions. The physical arrangement for the filming procedure may be found in Figure 1. The films were similar in structure, in that each began with a title card, immediately followed by



Fig. 1. - Physical Arrangement for Filming

two practice items. The Utley and Katt tests were numbered in the film with number cards held by the speaker. The Semi-Diagnostic test was numbered in the carrier phrase used to introduce the pair of words, "Number one is . . . . " Fifteen seconds of blank film followed each test sentence. Following each carrier phrase containing the two test words was ten seconds of blank film.

It was important to control all factors not under investigation in this study. The speaker variable was not to be studied or evaluated. This factor was therefore controlled by selecting an adult female speaker, age twenty-seven, who was considered to have standard American speech, to be used in all three films.

The female speaker, wearing a basic blue dress and normal make-up, was photographed from the shoulders up. The speaker began and ended each sentence or phrase with an expressionless face and a closed mouth position.

An attempt was made to control possible extraneous movements on the part of the speaker. The method used was to have the speaker seated throughout the filming. In addition, an assistant viewed the speaker during the filming, reported excessive movements and, when they occurred, the sequence was retaken.

The following equipment was employed for filming and projection:

Motion picture camera (Bolex, Model H-16 reflex)
Lens (Kern Paillard, Pizar 25 mm, f. l.5)
Light meter (Brockway, Model S)
Light fixtures (Two 8" EAL Reflector Floods, one photoflood with Fiberglass diffuser, 500 Watt
Lamps)
16 millimeter film (Kodachrome II, Type A)

16 millimeter projector (Bell and Howell, Model 173)

40 by 40 screen (Radiant)

#### Testing Procedures

Three filmed lipreading tests were shown to thirty individuals, fifteen males and fifteen females. The subjects were all students at Michigan State University. Their educational placement ranged from freshman to graduate student. The group of subjects ranged in age from eighteen to thirtyseven, with a mean age of twenty-four. The mean female age was 22.4, and the mean male age was 26.4. No previous speechreading experience was required of these subjects, nor was any speechreading training given them prior to the experiment. No tests of hearing or vision were administered. The subjects were asked if they had any hearing or vision problems. No subject was used who reported problems with either sense modality.

Since this was a study to determine the relationship among three tests of speechreading and variability due to the test order was to be controlled, the thirty subjects were divided into three groups of ten each. There was a possibility that, had the thirty subjects viewed each film in the same order, fatigue, learning and set may have affected the test results. The three groups each contained five males and five females. The groups were labeled Groups A, B and C. The order of test presentation for the three groups will be discussed subsequently.

The tests were administered in the Speech and Hearing Science Laboratory at Michigan State University. The screen

was suspended at a height so that the top of the image reflected was approximately five feet five inches from the floor.

The chairs used by the subjects were arranged in two rows facing the screen. Four chairs were placed in the front row at a distance of eight feet from the screen. The second row had six chairs, placed ten feet from the screen. The chairs of each row were so placed that no chair in the first row was directly in front of a chair in the second row. The two rows were divided so that no chair was directly in front of the projector.



Fig. 2. - Physical Arrangement for Testing

The projector was placed twelve feet from the screen to make the image viewed, life size. In addition to the light reflected from the screen, a small light placed three feet behind the projector was the only other source of illumination.

Figure 2 is a diagram of the typical seating arrange-

ment used during the administration of the filmed speechreading tests.

As stated previously, the thirty subjects were divided into three groups of ten subjects each. Group A viewed the films in this pre-designated order: Utley, Katt and Semi-Diagnostic. Group B viewed the Katt test first, followed by the Semi-Diagnostic and the Utley tests. The order of tests for Group C was Semi-Diagnostic, Utley and Katt. Since all three subject groups viewed all three test films through different orders, the procedure for testing for each group was identical. Therefore, for purposes of simplification, only the procedure for Group A will be described.

Before the subjects entered the room the seats and all equipment had been arranged in the pre-determined order. Answer sheets, instruction sheets for the Utley test, and a pencil had been placed on each desk. After the subjects selected their chairs, they were instructed to record their name, age, group letter "A," test number "1," in the appropriate blanks on the answer sheet. The answer sheets employed are located in Appendiccs B, C, and D.

When these preliminaries had been completed, the subjects were asked to read their instruction sheet as the instructions were being read aloud to them. Instructions for the Utley test were as follows:

You are about to view a silent motion picture film in which a speaker will say thirty-one sentences. The speaker will hold a number card prior to saying each sentence. The numbers seen in the film correspond with those on the score sheet.

You are to view each sentence carefully and determine

what was said. In the fifteen-second interval between each sentence, record on your score sheet what you think the speaker said.

There will be two practice sentences given before the test begins. Are there any questions?

The subjects were also urged to make the best guesses they could. When all questions had been answered, the two practice sentences were viewed. The subjects' responses were checked for accuracy and further questions were answered. This procedure of checking the practice sentences eliminated possible errors in the actual test and allowed the subjects to adjust to the film-test situation. The most common problem eliminated by this procedure was the hesitancy of the subjects to record the one or two words they did speechread when they were unable to understand the entire sentence.

The first test film was then administered without stopping. When the first film was concluded, a five-minute break was introduced during which time the instruction and answer sheets were collected and the Katt Test materials were distributed.

- ないとうない 人間の かない ないない ないない

The subjects were instructed to fill in their name, age, group letter "A" and test number "2." The same procedure was followed as previously outlined. The instructions for the Katt Test were:

You are about to view a silent motion picture film in which a speaker will say sixteen sentences. The speaker will hold a number card prior to saying each sentence. The numbers seen in the film correspond with those on the score sheet.

You are to view each sentence carefully and determine what was said. In the fifteen-second interval between each sentence, record on your score sheet what you think the speaker said.

There will be two practice sentences given before

the test begins. Are there any questions? Following the completion of this task another five-minute break occurred.

The Semi-Diagnostic test was then administered in a similar manner. The instructions for this test were as follows:

You are about to view a silent motion picture film in which a speaker will say fifty words. These words will be spoken two at a time in a numbered phrase, "Number one is \_\_\_\_\_\_." As you can see by the score sheet, this is a multiple-choice word test. Choose one word from each group of four answers. In the ten-second interval between each phrase, draw a line through the words you saw. There will be twenty-five numbers given and every number will be followed by two words. The two words do not have to be across from each other on the score sheet, nor do they mean anything together. If you see a word, or part of a word and are not certain what it is, make the best guess you can. There will be two practice phrases given before the test. Are there any questions?

The average time for administering the entire group of speechreading test films was forty minutes.

#### Scoring the Tests

The key sentence lists served as the guides to correct the responses on the Utley and Katt tests. Each test was graded by obtaining the percentage of words correct in each sentence. The percentage correct was also computed for the Semi-Diagnostic test. Because this was a multiplachoice test, the possibility of correct answers by guessing was increased. A correction for guessing was employed. The percentage score for each subject was obtained by inserting the number of right and wrong responses into the following formula: Percent score =  $2(-\frac{M}{3})$ .

Thus three percent scores were derived for each subject, one for the Utley test, one for the Katt test, and one for the Semi-Diagnostic test. These data were employed as the criterion scores in the correlation procedures.

# CHAPTER IV

### RESULTS AND DISCUSSION

#### Relationships Among Tests

The objective of this study was to determine (1) whether there was a relationship among the three filmed tests of speechreading ability, (2) whether there was a significant difference in mean scores of the three tests, and (3) whether there was a difference of mean scores between the male and female test scores.

The criterion measure on the Utley and Katt tests was the percent of words correct in each sentence for each subject. The percent score was also computed for the Semi-Diagnostic test employing the correction formula previously stated. The mean and standard deviations were computed for each of these tests. The results are exhibited in Table 1.

TABLE 1. MEAN AND STANDARD DEVIATIONS FOR THE UTLEY, KATT AND SEMI-DIAGNOSTIC TESTS FROM THE SCORES OF THIRTY NORMAL HEAR-ING SUBJECTS.

	UTLEY	KATT	SD
Mean Score (%)	38.00	23.63	33.96
Standard			
Deviation	13.90	12.10	15.10

<u>Pearson's Froduct Moment Correlation</u> procedure was employed to evaluate the possible relationship among the three tests of speechreading ability. The obtained correlations are exhibited in Table 2.

TABLE 2. PEANSON'S FRODUCT NOMENT CORRELATIONS FOR THE UTLEY, KATT AND SEMI-DIAGNOS-TIC TESTS BASED ON A GROUP OF THIRTY NORMAL HEARING SUBJECTS.

	Katt	3D	
Utley	•78	• 56	
Katt		.1.5	

The relatively low correlation coefficients, r = 0.56 and r = 0.45, when pairing the Utley and Katt tests to the Semi-Diagnostic test, indicates that the relationship of the Semi-Diagnostic test to either the Utley or Katt test is of moderate to little clinical significance for purposes of predicting behavior.

The correlation r = 0.78 between the Katt and Utley tests indicates that a relatively high relationship exists between them. The structure of the test instruments may have been a contributing factor in determining the low correlations to the Semi-Diagnostic test. Recall that the Utley and Katt tests are structurally similar, as both are sentence recognition tests. The Semi-Diagnostic test is a multiple-choice word test.

### Evaluation of Test Difficulty

From the test scores under consideration, the speechreading difficulty value was obtained for each test. The difference in mean scores was evaluated for significance by means of the two-tailed  $\underline{t}$  test at the .05 level. The required  $\underline{t}$  for significance at the indicated level, with df = 29, had to equal or exceed 2.045. The three obtained <u>t</u> scores were 1.775 for the Utley and Semi-Diagnostic tests, 3.8307 for the Katt and Semi-Diagnostic tests, and 8.809 for the Utley and Katt tests. There was no significant difference in difficulty when comparing the Utley and the Semi-Diagnostic tests. When comparing the Katt test to the Utley or the Semi-Diagnostic test the resulting <u>t</u> values were significantly more difficult than either of the other tests.

### Performance of Males and Females

The null hypothesis for the one-tailed  $\underline{t}$  test at the .05 level was that the mean speechreading percent score for females is not equal to or less than that of the males. The required  $\underline{t}$  for rejection of the null hypothesis with a df = 28, was 1.70. By averaging scores across the three tests for each subject, a  $\underline{t}$  of -1.70 was computed. The null hypothesis was rejected. The alternate hypothesis that the mean speechreading percent score for females is significantly higher than that of the males, was accepted.

#### Discussion

As a result of the statistical treatment of the data, the questions posed in Chapter I could be answered.

- What is the statistical relationship existing between the Utley sentence test, Form A, and the Katt test, Form B? There is a significant correlation existing between these two sentence tests.
- 2. What is the statistical relationship existing between the Utley sentence test, Form A, and the Semi-Diag-

nostic test, Form 1D? In terms of subject performance there appears to be no more than a moderate relationship between the two tests. They cannot be used to predict behavior reliably on the opposite test, nor are they interchangeable.

- 3. What is the statistical relationship existing between the Katt test, Form B, and the Semi-Diagnostic test, Form 1D? There is little significant relationship between them as indicated by the correlation of .45. They cannot be used to predict behavior reliably on the opposite test, nor can they be used interchangeably.
- 4. Is there a significant difference in mean scores obtained on the Utley and Katt tests? There was a significant difference in difficulty value, as indicated by the two-tailed <u>t</u> test. The Katt test appeared to be a significantly more difficult speechreading task than the Utley test.
- 5. Is there a significant difference in mean scores obtained on the Utley and Semi-Diagnostic tests? There was no significant difference in difficulty between the two tests as indicated by an evaluation of the mean scores.
- 6. Is there a significant difference in mean scores obtained on the Katt and Semi-Diagnostic tests? The Katt test proved to be significantly more difficult than the Semi-Diagnostic test.

7. Is there a significant difference in mean scores across the three tests, obtained from males and females? A significant difference of mean scores between males and females was achieved, indicating that normal hearing females do perform better than males on a speechreading task.

#### CHAPTER V

### SUMMARY, CONCLUSIONS, AND IMPLICATIONS FOR FURTHER RESEARCH

#### Summary

It was the purpose of this study to investigate the relationships among three tests of speechreading ability. Three sets of data were collected. First, the nature of the relationship among the three tests was determined. Secondly, the study was concerned with the significant differences of means among the tests, and finally, the significant differences between scores as a function of sex were determined.

In order to obtain these data, three specific speechreading tests were carefully selected. The first test selected for this study was the <u>Utley Sentence Test</u>. It was primarily selected because it is standardized and has a demonstrated correlation with certain other tests. In addition, it had also been consistently used in research and was a carefully developed test. Form A of the sentence test was preferred due to the maximum length of sentences.

The <u>Katt Sentence</u> <u>Test</u> was chosen, for it was relatively new and had never been correlated with other similar tests. Form B of the test was selected as the longer test.

The final test chosen was the <u>Semi-Diagnostic</u> <u>Test</u> for <u>Aural Rehabilitation</u>, Form 1D, a multiple-choice word

test, which lacked demonstrated correlation with sentence tests.

The three tests were filmed on sixteen millimeter silent motion picture color film. One female speaker was employed for all three films. These films were shown to three groups of subjects in a designated order. Each group contained five male and five female normal hearing adult subjects.

Three percent scores were derived for each subject, one for the Utley test, one for the Katt test, and one for the Scmi-Diagnostic test. From these raw data the following statistics were obtained. To determine the relationship among the tests, the scores were compared by means of the Pearson Product-Moment Correlation. A  $\underline{t}$  test was used to determine the comparative difficulty of each test. The significant difference in scores as a function of sex was demonstrated by a  $\underline{t}$  test.

The statistical data were then interpreted. The correlational relationship existing between the Utley and Katt tests was 0.78. It was found that the relationship between the Semi-Diagnostic test and the Utley test was not as high (0.56), nor was the relationship between the Semi-Diagnostic and the Katt test (0.45) significant. It was also revealed that the Katt test was the most difficult of the three tests; the Utley and Semi-Diagnostic tests were equal in difficulty.

It was found that the female subjects' test scores were significantly higher than the male subjects' test scores.

This was achieved at the .05 level.

It is therefore concluded that the Katt and Utley tests may well be used interchangeably since they tend to rank order subjects in similar fashion.

#### Conclusions

Within the framework of this study, the following conclusions can be made about the three tests of speechreading:

- There was a difference in scores according to sex, with females obtaining higher speechreading scores than males.
- 2. There is a significant positive correlation existing between the Utley and Katt sentence tests.
- There is a positive but low relationship existing between the Semi-Diagnostic and either the Utley or Katt tests.
- 4. The Semi-Diagnostic and Utley tests are similar in degree of difficulty.
- 5. The Katt test appears to be more difficult than either the Utley or Semi-Diagnostic test.

### Implications for Further Research

From this study two possibilities for further research have evolved.

1. A study is needed to determine whether the consonant and vowel errors on the Semi-Diagnostic test correlate with those on the sentence tests and whether this knowledge can be used to predict the errors on the sentence tests.

2. Further research should be undertaken to determine exactly what each of these tests does measure and how they can be employed in a complementary manner. APPENDICES

### AFPENDIX A

SUBJECTS RAW PERCENT SCORES FOR THE UTLEY, KATT AND SEMI-DIAGNOSTIC TESTS

	Subject	Utley	Katt	3-D
Group A	1 2 3 4	47 30 52 31	32 20 52 17	47 35 55 52
Group B		<u>52</u> 56 72 31	40 29 48 24	<u>21</u> 39 52 35
	9 10	13 46	13	27 
Group C	12 13 14 15	50 22 41 47 25	27 14 27 44 16	20 7 37 57 44

FEMALES

MALES

	Subject	Utley	Katt	S-D
Group A	16 17 18 19 20	46 38 34 24 53	25 9 32 18	59 39 24 39
Group B	21 22 23 24 <b>25</b>	21 40 43 <b>30</b> 38	17 15 16 23 14	0 5 44 28 36
Group C	26 27 28 29 <b>3</b> 0	39 52 29 10 34	20 39 13 0 7	25 39 31 7 39

APFENDIX B

SUBJECT RESPONSE SHEET FOR THE UTLEY LIPREADING TEST, FORM A

<u> </u>	UTLEY LIPREADING TEST, FORM A Group	
NAME	AGE DATE	
	••••••	
PRACTICE: A	<u>ت</u> .	
TEST:		
1.		
3.		
4.		
5		
2		
8.		
9		
10.		
12.		<b></b>
13.		
14.		
16.		
17.		
18.		
20.		
21.		
22.		
24.		
25.		
26.		
28.		
29.		
30		

# APPENDIX C

SUBJECT RESPONSE SHEET FOR THE KATT SENTENCE TEST, FORM B

<u>'</u>	KATT TEST, FORN B	Group
NAME	AGE	DATE
PRACTICE: A.		
B		
TEST: l.		
2.		
3		
4		
5		
5		
7		
.9		
9		
lo		
lı		
12		
13		
14		
15		
16		

# APPENDIX D

SUBJECT RESPONSE SHEET FOR THE SEMI-DIAGNOSTIC TEST FOR AURAL REHABILITATION, FORM 1D

# <b>_</b>			S-D TEST, FORM 1D				C	Group	
NAME			AGE					DATE	
				• • • •		•			, <u></u>
FRACTICE: A. led laid lad licd		an add add am		B: I'd bar: eyes bur: ice bor: I've bee:		n n n			
TES	Τ:			• • • •	• • • •	•			
1.	bite light night might	less leg let led	10.	run gun won fun	with Win W <b>ill</b> Wish	19.	well wool we'll will	'tne 3 he we me	
2.	seem sing seed seen	song some sun such	11.	wide ride died lied	wine wise wife white	20.	cool fool pool tool	coat cut caught cat	t
3.	wind wing will Win	tame same came shame	12.	yet get met let	cat catch cap <b>c</b> an	21.	look luck lake lock	ill is if it	
4.	note vote wrote boat	he see key tea	13.	not night nut net	ice I've I'd eyes	22.	rise wise lies dies	place plays plate play	
5.	plane played play plate	born barn been burn	14.	see key she ten	bow low row go	23.	lack leke like luck	ball bull bowl boil	
6.	wear dare pair bear	by high pie tie	15.	what wood word wide	chained change chair chains	24.	died dad did dead	leid lad lied lod	
7.	fell fill full feel	seat sit sat set	16.	then pen hen ten	pain pon pine pen	25.	at eat it ate	mean men mine man	
9.	for fair fur far	they bay Soy day	17.	day ray lay way	seed seek seat seen				
9.	pile pool pull pole	fair fur far fire	13.	am an at an	ten pen when then				

BIBLIOGRAFHY

- Brannon, J. B. "Speech Reading of Various Speech Materials," Journal of Speech and Hearing Disorders, XXVI (November, 1961), 348-354.
- Byers, Vincent W. and Lieberman, Lewis. "Lipreading Ferformance and the Rate of the Speaker," Journal of Speech and Hearing Research, II (September, 1959), 271-276.
- DiCarlo, L. M. and Kataja, R. "An Analysis of the Utley Lipreading Test," Journal of Speech and Hearing Disorders, XVI (August, 1951), 226-240.
- Heider, F. K. and Heider, G. M. "Studies in the Psychology of the Deaf," <u>Psychological Monographs</u>, LII (1940), 124-133.
- Hutton, C., Curry, E. T., and Armstrong, M. B. "Semi-Diagnostic Test Materials for Aural Rehabilitation," <u>Journal of Speech and Hearing Disorders</u>, XXIV (November, 1959), 319-329.
- Lowell, Edgar. "New Insight into Lipreading," <u>Rehabilitation</u> <u>Record</u>, II (July-August, 1961).
- Mason, Marie K. "A Cinematographic Technique for Testing Visual Speech Comprehension," Journal of Speech and <u>Hearing Disorders</u>, IIX (May, 1943), 271-278.
- Morkovin, B. V. and Moore, L. M. <u>A Contextual Systematic</u> <u>Approach for Speech Reading</u>. Los Angeles: University of Southern California, 1948-49.
- O'Neill, John J. and Oyer, Herbert J. <u>Visual Communication</u> for the Hard of Hearing: History, Research, and <u>Methods</u>. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961.
- O'Neill, John J. and Stephens, Mary C. "Relationships Among Three Filmed Lipreading Tests," <u>Journal of Speech and</u> <u>Hearing Research</u>, II (March, 1959), 61-65.

Personal interview with T. Katt, December, 1959.

- Pollach, Sheridan, and Williams. <u>Our English Language</u>. New York: Macmillan Co., 1961.
- Reid, Gladys. "A Preliminary Investigation in the Testing of Lipreading Achievement," <u>Journal of Speech and Hear-</u> <u>ing Disorders</u>, XII (February, 1947), 77-82.
- Simmons, Audrey Ann. "Factors Related to Lipreading," Journal of Speech and Hearing Research, II (December, 1959), 340-352.

- Smith, Richard C. "An Investigation of the Relationship Between the Lipreading Ability and Intelligence of the Mentally Retarded." Unpublished Master's thesis, Michigan State University, 1964.
- Utley, Jean. "A Test of Lipreading Ability," <u>Journal of</u> <u>Speech and Hearing Disorders</u>, XI (May, 1945), 109-116.
- Wynn, Margaret. "Norms for a Film Presentation of the 1959 Revision of the Semi-Diagnostic Test in Aural Rehabilitation." Unpublished Master's thesis, Michigan State University, 1964.

