LISTENING AND RELATED VARIABLES

Thesis for the Degree of M. A. MICHIGAN STATE UNIVERSITY Mary Spruell 1962 THESIS

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ABSTRACT

LISTENING AND RELATED VARIABLES

by Mary Spruell

The purpose of this study is to attempt to determine the relationship between each pair of the following variables: picture listening test scores, story listening test scores, discrimination test scores, intelligence scores, achievement scores, and teacher ratings of listening scores.

The subjects for this study were 278 elementary school children in grades one through six. The picture listening scores, the story listening scores and the discrimination scores had been previously collected by Elsie M. Edwards, the Department of Speech, Michigan State University in connection with a listening research project. The intelligence and the achievement scores were gathered from the subjects' cumulative school folders. This investigator obtained each teacher's ratings of listening ability of her students during an individual rating period.

The findings of this study indicate that there are relationships between certain pairs of the six test variables although the standard errors of these relationships are probably high. The same relationship for the variables does not appear to be consistent for the different grades.

Mary Spruell

The variables that show high and low correlations are different for some of the grades. A ceiling effect was observed on several of the tests, especially in the upper elementary grades.

The conclusions which were drawn from this study suggest that further revision of the picture listening, the story listening, and the discrimination tests, constructed by Dr. Edwards, might be done in an attempt to eliminate the observed ceiling effect. Teacher rating of listening ability scores tended to have the lowest degree of correlation with all of the other six variables.

Approved: 7/ (2) Director

LISTENING AND RELATED VARIABLES

by

Mary Spruell

A THESIS

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

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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

Listening is one of the oldest, most used and one of the most important elements of the interpersonal communication process.¹ Wendell Johnson as cited by Anderson says:

As the world grows more ominously voluble by the hour, the words we hurl at each other are no more confusing and maddening or clarifying and calming than our habits of listening permit them to be. Until they reach our ears they are mere sound waves, gentle breezes harmless as a baby's breath. It is through the alchemy of listening that they become transformed into the paralyzing and confulsant toxins of distrust and hate or the beneficent potions of good will and intelligence.²

Of necessity listening is the chief mode of learning in the early school years during which children are learning to read. Throughout the primary grades they find listening a far better way than reading to gain information.³

¹Ralph G. Nichols and Leonard A. Stevens, <u>Are You</u> <u>Listening</u>? (New York: McGraw-Hill, Inc., 1957).

²Harold A. Anderson, "Needed Research in Listening," Elementary English, 29 (April, 1952), p. 215

³Althea Beery, "Interrelationships Between Listening and Other Language Arts Areas," <u>Elementary English</u>, 31 (March, 1954), pp. 164-172.

Statement of Problem and Purpose of Study

This study is an outgrowth of a research project that was carried out by several members of the Department of Speech at Michigan State University in the fall of 1961, in which attempts were made to determine the relationship between listening ability and discrimination ability of elementary school subjects.¹ The problem from which this study arose is the apparent lack of research information about listening and its related variables. The purpose of this study is to attempt to determine the relationship between each pair of the following sets of scores: listening picture scores, listening story scores, discrimination scores, intelligence scores, achievement scores, and teacher ratings of listening scores. The scores were achieved by elementary school subjects in grades one through six. It is hoped that answers to the following questions can in part be obtained: (1) Is there a relationship between pairs of the six test variables, as measured in grades one through six? (2) For what paired variables is the relationship the highest? (3) For what paired variables is the relationship the lowest?

¹Elsie M. Edwards and Herbert J. Oyer, "The Relationship Between Listening Ability and Sound Distrimination of Elementary School Children," Paper presented to the American Speech and Hearing Association Convention, Chicago, Illinois, November 7, 1961.

Hypothesis

To answer the above questions the following hypothesis has been proposed:

 There is a relationship between certain pairs of the six test variables.

The results of the study will be analyzed to determine with which of the paired variables the relationship seems to be geneally high and with which they appear to have a low relationship.

Importance of Study

In the year 1930, Paul T. Rankin, who was supervising director of research and adjustment for Detroit Public Schools, reported on the relative amount of time devoted to listening as compared to the other language arts. He selected twenty-one adults of different occupations and asked them to record, every fifteen minutes, the distribution of time spent talking, reading, writing, and listening. This survey was carried on for approximately two months.¹

Rankin found that seventy per cent of his subjects' working day was spent in verbal communication. He also learned that of all their verbal communication time the twenty-one adults spent an average of nine per cent in

¹Paul T. Rankin, "The Importance of Listening Ability," <u>English Journal</u>, 17 (October, 1928), pp. 623-630.

writing, sixteen per cent in reading, thirty per cent in talking, and forty-five per cent in listening.¹

From this study, Rankin showed that we use almost three times as much time listening as reading and yet a survey in the Detroit Schools by Rankin showed that reading was receiving fifty-two per cent of the emphasis in classroom instruction and listening was only receiving eight per cent.²

In a more recent study, Miriam E. Wilt found that with 530 children at the elementary school level, the median daily listening time was one hundred and fifty-eight minutes. The children spent about two and one-half hours of the five hour school day in listening.³

In 1952 Anderson prepared an exhaustive bibliography of articles, monographs, and theses in the field of listening. The total is no more than one hundred and seventy-five titles. Of these about fifty may be loosely classified as research.⁴

The Knower Index of Graduate Theses in Speech indicates well the steadiness, but noticeable lack of research

l<u>Ibid</u>.

²Ibid.

³Miriam E. Wilt, "A Study of Teacher Awareness of Listening As a Factor in Elementary Education," Journal of Educational Research, 43 (April, 1950), pp. 626-636.

⁴Anderson, <u>op. cit</u>., pp. 215-224.

in listening. During the last ten years, the Knower Index has reported a yearly average of eight graduate studies in listening.¹

This paucity of research in the field has hampered progress in the understanding and the teaching of listening. It is hoped that some insight into the understanding of listening and its relationship to other variables might be gained through a statistical analysis of the scores obtained in this study.

Definition of Terms

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

<u>Picture listening test</u>.--This measurement was one collected for a research project by the Department of Speech at Michigan State University in the fall of 1961.² The first part of the test was composed of twelve rows of animal pictures, three in each row. An oral stimulus was given in which the subjects were instructed to mark one picture in the row with a certain type of mark, e.g., a circle around the cat, a cross on the goat, a line at the bottom of the cow, etc. The second part of the test was composed of twelve rows of pictures, three in each row, for which a corresponding sound had been recorded. The

²Edwards, <u>op. cit.</u>

¹Franklin H. Knower, "Graduate Theses--An Index of Graduate Work in Speech," <u>Speech Monographs</u> (carried annually in one of the issues.

subjects were instructed to put a mark on the picture of the one that makes the recorded sound, e.g., put a circle around the one that makes the sound (ringing of a bell), put a line under the one that makes the sound (running of water), etc.

<u>Story listening test</u>.--This measurement was another one collected for the listening research project at Michigan State University. The story used was "How Bertha Giraffe Lost Her Voice" by Katherine Nuttey, taken from the <u>Grade Teacher</u>, June, 1943.¹ After hearing the recorded story, the subjects were to answer fifteen questions. They were instructed to mark an X on the one picture in a set of three that answered the question, e.g., Where was Bertha resting? (picture of giraffe under a tree), What did Bertha hear in the top of the tree? (picture of a bird), etc.

<u>Discrimination test</u>.--This test score was obtained for the study carried out at Michigan State University in the fall of 1961.² The test was patterned after the speech sound discrimination test originally developed by Travis and Rasmus. Each pictured word pair had a phonetic restriction imposed so that only one phoneme could be varied

> ¹<u>Ibid</u>. ²Ibid.

in a pair, e.g., pie-pie; pie-tie; and tie-tie, coat-goat; goat-goat; coat-coat, etc. There were thirty-two rows, three sets in a row, presented to the subjects, and they were asked to check the picture of the spoken pair.

Teacher rating score of listening ability.--A seven point rating scale was given to the teacher by the investigator on which appeared the names of his students. The teacher was instructed to estimate the listening ability of her students.

Intelligence score. -- The score, from a test designed to show the relative mental capacity of a person, was collected from the subjects' school cumulative folder. Only scores from group tests were used.

<u>Achievement score</u>.--A test for measuring an individual's progress in the mastery of subjects to be learned. The test is administered according to grade placement level and is expressed in terms of grade level achievement. This score was obtained from the subjects' cumulative folder.

<u>Hearing</u>.--Implies that there is a reaction to sound. It does not necessarily mean that any interpretation is made.

<u>Auding</u>.--Don Brown who coined the word as a substitute for listening defines this new term as "the process of

hearing, listening to, recognizing, and interpreting spoken symbols."¹

Organization of the Thesis

Chapter I has contained the statement of the problem which led to this study. It has included an introduction to the topic and a statement of the problem. The hypothesis to be considered has been put forth, the importance of the study was discussed, and definitions of terms which will be used throughout the study were presented.

Chapter II will contain a review of the literature available on this topic.

Chapter III will consist of a discussion of the subjects, the method of gathering scores, and the criteria for the elimination of subjects.

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

Chapter V will contain a summary and the conclusions of the study.

l John G. Caffrey, "Auding," <u>Review of Educational</u> <u>Research</u>, 25 (April, 1955), pp. 121-138.

CHAPTER II

REVIEW OF THE LITERATURE

Listening and Reading

Most of the research concerning the relationship of listening ability to other language skills has centered around its effect on reading ability.¹ From much of the research has come conflicting results. According to one summary, correlations between reading and listening comprehension are from .60 to .82.² Brown and Carlsen as cited in Keller, found only small correlations between their test of listening comprehension and tests of reading comprehension. They concluded that the skills are in no way identical.³ Caffrey reports from his own Grade V data, coefficients ranging from .51 to .56 for auding and reading correlations.⁴

¹Berry, <u>op. cit</u>.

²National Conference on Research in English, <u>Inter-</u> <u>relationships Among the Language Arts</u> (National Council Teachers of English Bulletin, 1954), pp. 1-42.

³Paul W. Keller, "Major Findings in Listening in the Past Ten Years," <u>Journal of Communication</u>, 10 (August, 1954), pp. 29-38.

⁴Caffrey, <u>op. cit</u>.

The improvement in reading cannot be assumed to result in the improvement in listening. In fact listening ability which exceeds reading comprehension among primary pupils, becomes less efficient as reading skill increases.¹ Stromer supports this belief and found that while it was possible to improve listening comprehension through training in listening, it did not seem possible to increase reading comprehension through training in listening.²

Iver Moe, as cited by Toussaint, studied the prognostic value that auding tests have for reading. He found that in the first grade a single test of auding ability in the fall predicted reading performance in March as well as, or better than, either of two reading readiness tests or an intelligence test. His findings for second and third graders were inconclusive.³

Owen, as cited by Toussaint, tested the predictable value of listening tests at the primary level. His findings show that with children from grades two, three, and four, reading expectancy can be predicted more

¹Chester W. Harris (ed.), <u>Encyclopedia of Educational</u> <u>Research</u> (New York: MacMillian Company, 1960), pp. 309-310.

²Walter F. Stromer, "An Investigation Into Some of the Relationships Between Reading, Listening, and Intelligence," Speech Monographs, 21 (August, 1954), pp. 159-160.

³Isabelle H. Toussaint, "A Classified Summary of Listening, 1950-1959," <u>Journal of Communication</u>, 10 (September, 1960), pp. 125-134.

accurately by combined measures of reading and listening than by using a single measure of intelligence or listening. Spache as cited by Caffrey suggested that measures of auding ability mark ceilings for reading ability.¹

Schonell as cited by Berry reports a study in which he rates weakness in auditory discrimination of speech sounds as one of the most important and most frequently occurring causal factors in poor reading.²

Paul Keller reports that,

work done in the fifties has seemed to support convincingly the assumption that listening is a phenomenon clearly separable from reading. The impact of the finding [cited, to be sure, from only part of the studies available] appears to be to establish a clear-cut profile of listening as a complex of skills separable from those involved in reading. J

Listening and Achievement

N. F. Stump found the coefficient with oral examination and mental ability is nearly four times as large as with the written examination: r = 0.74 and r = 0.20, respectively. Since there is a much higher relationship between scores in the oral examination and mental ability, he concluded, at least tentatively that the oral examination is somewhat superior in telling the true story of achievement.4

¹Caffrey, op. cit. ²Beery, op. cit.

³Keller, <u>op. cit</u>., pp. 30-31.

⁴N. F. Stump, "Oral Versus Printed Methods in the Presentation of the True-False Examination," Journal of Educational Research, 18 (December, 1928), pp. 423-424.

Keller indicated that scholastic aptitude as a correlation of listening at this stage of research appears to be a "moot matter." In support of this belief, Keller cites the following studies: Brown and Carlsen see a moderate correlation between listening comprehension and scholastic success; John A. Haberland finds little agreement between listening test results and academic ratings; and Paul I. McClendon reports a positive correlation between listening comprehension and scholastic aptitude. Keller offers the lack of uniformity in their respective definitions of "scholastic aptitude" as a possible explanation to these seeming contradictions.¹

Listening and Intelligence

There is a need for research to ascertain the relationship between listening competence and intelligence and between listening and school achievement. Anderson believes the few studies which have been done have minor findings as compared with the importance of the questions.²

Rankin as cited by Caffrey reported a correlation of .56 between scores of three hundred elementary school children on auding and the Detroit Intelligence Test. Caffrey further reported Dow's auding-intelligence correlation of .44 and Hall's correlation of the same factors at .48. Caffrey himself reported an auding-intelligence correlation of .58.³

> ¹Keller, <u>op. cit.</u>, p. 34. ²Anderson, <u>op. cit</u>. ³Caffrey, <u>op. cit</u>.

Althea Berry reports two more studies in her article in which the correlation range between intelligence and listening is r = .27 reported by Knower, Phillip and Koeppel to r = .56 from a study by Arthur W. Heilman.¹

Stromer in his investigation of listening defined good listeners as those who ranked below the fifteenth percentile. He then reported that the good listeners were found to have significantly higher mean scores on the following aspects of the Wechsler-Bellevue Intelligence Scale: full scale, total verbal, total performance, information, vocabulary, similarities, arithmetic, picture completion, and block design. He reported no significant differences between the scores of the good and poor listeners on the following aspects of the Wechsler-Bellevue Intelligence Scale: comprehension, digit span, picture arrangement, object assembly, and digit symbol.²

Listening Tests

Anderson contends that one immediate reason for the lag in research with listening is that no test of listening ability has been available.³ Recently a number of experimenters have succeeded in developing tests of listening

¹Berry, <u>op. cit</u>. ²Stromer, <u>op. cit</u>., p. 160, ³Anderson, <u>op. cit</u>.

comprehension possessing encouragingly high degrees of reliability and validity. Keller contends that most significantly, perhaps has been the standardization and continued use and refinement of two such tests: The Brown-Carlsen Listening Comprehension Test and the test developed by the Educational Testing Service (Princeton, New Jersey, 1951). The Brown-Carlsen Test has become a part of the World Book Company's "Evaluation and Adjustment Series." Perfect reliability is not claimed for the test, but satisfactory correlations with several tests of mental maturity, intelligence, verbal skills, and mental ability appear to confirm its usefulness. Norms are established for grades nine through college freshmen. Another differently constructed listening test is the one produced by the Educational Testing Service as part of its "Sequential Tests of Educational Progress." The latter test differs from the former not only in content but also in its provision of forms, each with its own norms for grades four through college sophomore.

Teaching Listening

Good listening requires an enormous amount of energy as listening concentration is greater than the concentration required during any other form of personal communication. According to Nichols and Stevens, this concentration is

¹Keller, <u>op. cit</u>., pp. 31-32.

caused by the fact that we think much faster than someone talks. Our brains deal with words at a lightening pace; about five hundred words per minute, but when listening the brain must think at an extremely slow pace; the average person speaks at about the rate of one hundred and twentyfive words per minute. It is what one does with this spare time that holds the key to concentration in listening.¹

Nichols and Stevens list the four following mental processes that good listeners use their spare thinking time for:

	1.	The	listener	thinks	ahead	of	the	talker.	,
--	----	-----	----------	--------	-------	----	-----	---------	---

- 2. The listener weighs the verbal evidence used
- by the talker to support his points,
- 3. Periodically he reviews the talk,
- 4. He listens between the lines.²

Concentration upon the processes will improve the listening ability and it will leave little time for one to attend to mental tangents leading off into the world of distraction.

Nichols and Stevens when asked "What do you do to teach listening?" offer the following answer to the question:

When teaching students to listen, we first motivate them by increasing their awareness of the values obtainable through the auditory channels of learning; then we build experience in the habits that make for effective listening.³

¹Nichols, <u>op. cit</u>.

²Ibid.

³Ralph G. Nichols and Leonard A. Stevens, "You Don't Know How to Listen," <u>Colliers</u>, 132 (July, 1953), pp. 18-19. After the operation of a listening program at the University of Minnesota, Nichols reported in Colliers that the effectiveness of the training is proven by an average gain of twenty-five per cent in the listening proficiency of the groups. Assuming that the untrained efficiency level is as he reports it, a twenty-five per cent efficiency level, the average trained listener is operating at a fifty per cent efficiency level.¹

Two studies cited by Keller have further evidence that training can make a significant difference in listening comprehension. In the first, Arthur W. Heilman demonstrated a gain in listening ability that was significant beyond the one per cent level of statistical confidence for college freshmen after their being subjected to six weekly training lessons of only about twenty minutes each. The other study by Edward Pratt confirmed these findings when he subjected forty classes of sixth grade students to a series of training sessions. The experimental classes showed a gain of listening comprehension statistically significant beyond the one per cent level. Pratt's results suggested that the listening instruction imposed on the subjects was effective regardless of varying levels of intelligence.²

¹<u>Ibid</u>.

²Keller, <u>op. cit</u>., p. 33.

Listening and Teacher Awareness

Wilt carried out a study designed to find out how much children are supposed to listen; whether teachers are aware of how much they expect children to listen; and last to determine whether teachers are sensitive to the needs of all the children in an oral language situation rather than only to the needs of those who are doing the speaking or reading. The summary of the data is reported below:

- 1. Teachers estimate that children learned by listening 74.3 minutes; observation showed they listen 158 minutes;
- 2. Children are expected to spend more time in listening then any other single activity in the elementary school according to the timed observations;
- 3. Teachers are unaware of the amount of time they expect children to listen;
- 4. Seventy and one-half per cent of the teachers considered the needs of the speaker or the oral reader to be more important than those of the listener;
- 5. Teacher was being listened to fifty-four per cent of the listening time, children heard only thirty-one per cent of the time.¹

Listening and Visual Components

Keller discusses two studies, one by Edward Kramer and the other by John J. O'Neill, which reveal statistically significant advantage favoring the speaker who is present over the one who is not visible. O'Neill's study attempts to discover to what extent individuals with normal hearing make use of lip-reading cues to gain

¹Wilt, <u>op. cit</u>.

information as they listen. O'Neill concludes that the use of lip-reading cues was appreciable.¹

Caffrey cites a study by Gauger which reports that a speaker's use of gestures improved high school students auding and that auding scores were higher when the speaker was visible.²

Toussaint cites several studies which have suggested,

that it is not always important that the material be well organized, or spoken fluently but it is important that the speaker be seen and that the material of his speech be of high quality. Who the speaker is and how well he is liked also carry weight with the listener,³

Listening and Environment, Sex and Chronological Age

Hall as discussed in Caffrey reports a correlation of .36 between auding scores of fifth grade children and ratings of their fathers' occupations.⁴ Nichols and Stevens report the following research result: "good listening in children is related to occupations of parents, that is, rural children tend to be better listeners than urban children."⁵

¹Keller, <u>op. cit</u>., p. 35. ²Caffrey, <u>op. cit</u>. ³<u>Ibid</u>. ⁴Toussaint, <u>op. cit</u>., pp. 126-127. ⁵Nichols, <u>Are You Listening</u>?, <u>op. cit</u>. Both Nichols and Caffrey as cited by Caffrey report a sex difference in auding ability in favor of boys. The male superiority was not very great but was quite consistently noted and did not appear to be a function of item content or of age or mental ability.

Karraker and Caffrey as reported in Caffrey note little relation between auding ability and chronological age for high school students but there was a slight stepwise increase in auding skill at each grade level.

Intelligence Tests

The Science Research Associates Primary Mental

Abilities Test.--The Primary Mental Abilities test forms used were (a) for ages five to seven, Grades Kindergarten through two, and (b) elementary; ages seven to eleven, Grades three through six. The tests were developed by L. L. Thurstone and Thelma Gwinn Thurstone, Science Research Associates.

The following information was given by Normal **Frederiksen** and Albert K. Kurtz when the tests were re**viewed** for the <u>Fifth Mental Measurement Yearbook</u>:¹

Reliability: The reliabilities reported in the fiveseven age group technical supplement are split-half reliabilities, even for the highly speeded perceptual speed test. The reliabilities range from .77 for verbal meaning

¹Oscar Krisen Buros (ed.), <u>The Fifth Mental Measure-</u> <u>ments Yearbook</u> (Highland Park, New Jersey: Gryphon Press, 1959), pp. 708-717.

to .96 for perceptual speed. The reliabilities reported for the 7-11 level tests are based on Kuder-Richardson Formula 20. The correlations range from .79 to .95.

Validity: Validity data of various sorts are presented in the three manuals. Correlations with intelligence tests such as the Stanford-Binet and Kuhlmann-Anderson are high. At the 5-7 levels single tests such as those for verbal and reasoning ability correlate as high as .75 with Binet I.Q.'s with multiple correlations in the .80's. Correlations with reading readiness tests are above .50. At the 7-11 age level the correlations with I.Q's are slightly lower. High correlations with arithmetic and reading are reported with this level.

Over-all Evaluation: This is not an excellent test battery but is a good one. It is objective, easy to administer and has high face validity. It correlates fairly well with achievement test scores and some high score grades; it does not correlate with vocational training ratings or with college graduates. The chief defect is that there are so few studies of its predictive value.

The Metropolitan Readiness Tests. -- The Metropolitan Readiness Test has two alternate forms -- R and S. The test was reviewed by Eric R. Gardner, Associate Professor of Education Syracuse University, Syracuse, New York, in the Fourth Mental Measurements Yearbook.¹

loscar Krisen Buros (ed.), <u>The Fourth Mental Measure-</u> <u>Ments Yearbook</u> (Highland Park, New Jersey: Gryphon Press, 1953), pp. 604-606.

Reliability: The median reliability coefficients (Pearson r's between two forms administered a few days apart) of six determinations, based on groups of from 90 to 273 of beginning first grade pupils are provided for each subtest for the sum of scores on Tests 1-4 (reading readiness), and for total score. The reported reliability of tests 1-4 is .83; of Number Tests, .84; and of the total score, .89. The corresponding standard errors of measurement are 3.7, 1.9, and 4.6.

Validity: Face validity is claimed for the test, and some statistical data are presented as evidence of validity. In a study involving 487 cases, all of the forty-four pupils rated as "Superior" on the tests administered in September, 1948, were found to be above the national norm in average "reading achievement," and all but one above the norm in Numbers when tested in February, 1949, on the appropriate tests of Primary I Battery of the Metropolitan Achievement Tests.

Over-all Evaluation: From the technical point of view, the Metropolitan Readiness Tests are among the superior readiness tests available.

Achievement Tests

<u>Stanford Achievement Test</u>.--The 1953 revised Stanford Achievement Test was reviewed by L. L. Gage, Professor of Education, University of Illinois, Urbana, Illinois in the

Fifth Mental Measurements Yearbook.¹

Reliability: Each manual presents split-half reliability coefficients corrected by the Spearman-Brown formula for each subject and each grade level for which a given battery is intended. Each of these is based on about 240 pupils drawn at random from 34 school systems. With these are presented the means, standard deviations and standard errors of measurement. The fifty-two reliability coefficients range from .66 to .96 with a median value of approximately .88. All but nine of the reliability coefficients are .85 or higher.

Validity: The claim for validity of the tests is based on the "content of the typical elementary school curriculum, in addition to extensive experimentation prior to publication."

First Reader and Second Reader Achievement Test for Alice and Jerry Basic Reading Program.--This test is published by the Row-Peterson Company. Neither reliability nor validity coefficients were obtainable.²

¹Buros, <u>The Fifth Mental Measurements Yearbook</u>, <u>op</u>. <u>cit</u>., pp.75-80.

²Interview with Professor in the Department of Education, Michigan State University, East Lansing, Michigan.

CHAPTER III

SUBJECTS, MATERIALS, AND TESTING PROCEDURES

Subjects

Elementary school children in grades one through six were subjects in this study. There were fifty-four first graders, forty-eight second graders, twenty-eight third graders, thirty-three fourth graders, sixty-eight fifth graders, and forty-seven sixth graders. All of the subjects were enrolled in a public school in the Lansing area. Those students for whom scores on all six variables, as defined in Chapter I, were unobtainable, were eliminated from the study.

The fourteen teachers, whose classes were involved in the listening research project in the fall of 1961, completed the teacher ratings of listening on the subjects.

Materials

The raw listening and discrimination scores obtained in the earlier investigation were utilized. Edwards collected scores through use of the picture listening test, the story listening test, and the discrimination test defined in Chapter I.

A Listening Ability Scale for teacher ratings was devised by the writer and used to gather teacher rated scores for each of the subjects. The scale used zero as the cell for average listening ability with three points above and three points below the average cell. The scale appears in Appendix B.

Procedure

1. Collecting the Listening and Discrimination

<u>Scores</u>.--The writer had access to the scored forms used in the previously mentioned study. The data gathering procedure for the listening research project is quoted in Appendix A. The scored forms were separated first by grade and then according to each of the teachers within the grade. The names of each subject and his raw score for the picture listening test, the story listening test, and the discrimination test were recorded on a Raw Data Sheet. The same Raw Data Sheet also contained the scores achieved by each subject on the other three variables, i.e., the intelligence score, the achievement score, and the teacher rating of listening ability score.

2. <u>Collecting the Intelligence and Aphievement</u> <u>Scores</u>.--The school administration granted the writer permission to have access to the students' cumulative folders, providing the identity of the subjects was destroyed. The raw scores that were recorded therein were used, providing the same test measurement had been used for each subject

in that grade, e.g., The Primary Mental Abilities Test was used for most of the fifth grade subjects. Only those subjects whose scores were computed from this group test were used. The same procedure was followed with regard to the achievement score.

3. <u>Collecting the Teacher-Rated Listening Ability</u> <u>Scores.--The writer attended a teachers' meeting at the</u> public school at which time the teachers were given an explanation of the experiment.

Arrangements with the principal were made that enabled the investigator to see each teacher, individually, as her class came for its library period. Upon arrival, the teacher was given an instruction sheet to read. Another brief explanation of the study was given and instructions regarding the use of the "Listening Ability" rating sheet were included. The "Talk to the Teachers Meeting" is presented in Appendix C. As the teachers were seen individually for the fifteen minute rating period, they were asked to read the "Instructions" found in Appendix D.

CHAPTER IV

RESULTS AND DISCUSSION

Results

The test results were tabulated and subjected to a statistical treatment. It was the desire of the writer to determine the relationship between each pair of the six variables employed in the study.

Bivariate Frequency Distribution. -- A Bivariate Frequency Distribution was plotted from the raw data for each pair of the variables and is presented in Appendix F. The coding of the variables that appears on Appendix F and other Appendices is shown in Appendix E. The raw scores were grouped into intervals to keep the rows and columns as close to fifteen as possible. The cells contain values from one to six. Each of the numbers within a cell is an expression of the number of subjects who achieved corresponding scores on the variables represented by the rows and columns. An inspection of the Bivariate Frequency Distributions indicated that most of the variables were not linearly related. Therefore the correlation ratio (eta) was selected for the analysis rather than Product Moment r. The data on the Bivariate Frequency Distribution were coded and analyzed in the Michigan State University Computer

Laboratory. Further analyses were done by the investigator with a desk calculator to obtain eta coefficients.

<u>Curvilinear Correlation</u>.--The correlation ratio, eta, is the variance due to the difference between column-means taken as a ratio to the total variance in the bivariate frequency distribution. The formula employed was:¹

$E^2 = \frac{Between-groups sums of squares}{Total sum of squares}$

The correlation ratios that were obtained can be found on each of the Bivariate Frequency Distributions in Appendix F.

<u>Correlation-Ratio Matrix</u>.--A Correlation-Ratio Matrix using the eta scores is plotted for each grade and is presented in Appendix G, Table 1 through Table 6. The Matrix was plotted by taking the eta score from the Bivariate Frequency Distributions and placing it with the same variables that appeared on the Bivariate Frequency Distribution. The coded variables are listed on the left side and on the top of the matrix.

Discussion

Eta correlations were computed on the six variables employed in this study and are reported in Appendix F on the Bivariate Frequency Distributions. Upon close observation of the Bivariate Frequency Distributions it becomes

¹Virginia L. Senders, <u>Measurement and Statistics</u> (New York: Oxford University Press, 1958), p. 237.

apparent that the subjects in the upper grades are grouped at the top limit on several of the tests. This ceiling effect is very evident in grade five and six on the picture listening test, on the discrimination test and on the story listening test. The Bivariate Frequency Distribution sheets were included because it was felt that an inspection of the raw data would yield more information than that obtained from the correlation ratio. The ceiling effect as shown on the Bivariate Frequency Distributions resulted in data that are not readily amenable to statistical analyses. Many of the correlations appear to be spuriously high. The Bivariate Frequency Distributions (Appendix F) show that a radically deviated score is often responsible for the high correlation. The deviant subject's score may have been caused by the presence of an unknown factor such as hearing loss, emotional disturbance, etc. Since the school year had ended it was not possible to obtain further information on individual subjects.

The results tend to lend support to the hypothesis stated in Chapter I: There is a relationship between certain pairs of the six variables. The correlations between each pair of the six variables for each grade are presented in Appendix G. The eta correlations between each pair of variables are grouped as Moderate, .50 to .75; Low, .25 to .49, and Non predictive, .00 to .24 and are presented as Table 7 in Appendix H. Green explains that the correlation

has the following rough significance when the group is large--300 or more. For small groups the correlations are in general less significant.¹

- .50 to .75 These coefficients are not high enough to make good individual predictions, because many who are below average on one test will be above average on the other. The extremes of the group are predicted fairly well. Coefficients are useful for indicating group trends.
- .25 to .49 These coefficients are too low for individual use, but they roughly indicate group trends, and can be used to supplement other kinds of predictions.
- .00 to .25 These coefficients are often not significantly different from zero.

The following pairs of the variables appear to show a relationship:

The picture listening score and the intelligence scores show a correlation in grades one and two. This is to be expected as the picture listening test appears to be quite similar to the Primary Mental Abilities test.

Achievement and intelligence scores show the highest degree of correlation in grades four and five. The scores were obtained through the use of standardized tests and a linear relationship appears to be present between the two variables. This same correlation would be expected in grade six but because of the spuriously high correlation of two other sets of variables it appears to have the third highest correlation, even though it too is a moderate correlation.

¹Edward B. Green, <u>Measurement of Human Behavior</u> (New York: Odyssey Press, 1952), p. 49.
The lowest correlation determined in five of the six grades involved the teacher rating of listening score with either the picture listening test score or the story listening test score. In grades one, four, and six, the lowest correlation was between teacher rating of listening ability score and the the story listening test score. In grades three and five the lowest correlation exists between teacher rating of listening ability score and the picture listening test score. Grade two shows the lowest correlation between the teacher rating of listening ability score and the discrimination test score. There are no high or low relationships evidenced throughout all of the grades.

In considering the correlations stated it is important to be aware of the ceiling effect that has been demonstrated. The information obtained by a careful inspection of the Bivariate Frequency Distributions (Appendix F) is more valid than the correlation ratios, which were derived from them. Another fact that should be remembered is that the number of subjects for any analysis is no greater than sixtyeight. The standard errors of eta in this study would, therefore, be fairly large and the correlations would be subject to change on repeated investigation. The eta coefficients stated should be thought of as only roughly estimated values for the population sampled.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

Listening is one of the oldest, most used and one of the most in portant elements of the interpersonal communication process. Research has shown that people tend to spend approximately forty-five per cent of their working day in listening. Children in the primary grades use listening as the chief mode of learning and continue to spend more time in listening than in any other single activity in the elementary school program.

The purpose of this study has been an attempt to determine the relationship between each pair of the following six sets of variables: the picture listening test scores, the story listening test scores, the discrimination test scores, intelligence scores, achievement scores, and teacher ratings of listening ability scores. Attention was given to the variables with the highest and the lowest degree of correlation.

The importance of this study centers around the possibilities of gaining insight into the relationship of listening and related variables in the elementary school.

A review of the literature concerning listening indicated that compared to the importance of the subject, there exists a paucity of research. At best a great amount of even this research yields conflicting results. Research must be continued in an attempt to clarify the current trends and in order to gain an understanding of listening's relationship to other variables.

The subjects for this study were 278 elementary school children in grades one through six, enrolled in a public school in the Lansing area. The subjects had previously been involved in a listening research project. The subjects for whom scores on all six variables were unobtainable were eliminated from the study.

The findings of this study indicate that there is a relationship between certain pairs of the six test variables. The same relationship for the variables does not appear to be consistent for the different grades. The variables that show high and low correlations are different for some of the grades. A ceiling effect is observable on several of the tests, especially in the upper elementary grades.

Conclusions

1. Revision of the picture listening test, the story listening test, and the discrimination tests would be beneficial as an attempt to eliminate the grouping of subjects at the upper limit of the tests.

2. There is not a correlation between any set of variables that is consistent for all grades, but this may be due in part to the large standard error of eta.

3. Teacher ratings of listening scores as compared to all the six variables appears to have the over-all lowest correlation and non predictive value.

Implications for Future Study

It would be interesting to know if the Brown-Carlsen Listening Test, as reviewed in Chapter II, or the listening test developed by the Educational Testing Service of New Jersey, also reviewed in Chapter II, evidenced a ceiling effect during the developmental stages. Could the ceiling effect still be a problem of the test? The following questions might be set forth for future study:

1. Would the introduction of another variable, such as white noise, help to eliminate the ceiling effect on the story listening test, the picture listening test, and the discrimination test?

2. Might a relationship exist between teacher ratings of listening ability and teacher ratings of general behavior in the classroom?

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APPENDIX A

PROCEDURE EMPLOYED IN THE EARLIER RESEARCH PROJECT

The need for determining the relationship between active listening ability and auditory discrimination has been apparent for several years. An attempt was made to construct a set of objective group tests to answer this demand. The items in the tests were selected to be used over a range of abilities from grade one to grade six in the elementary schools. The tests were set up so that children might respond to the test stimuli through multiple choice pictures in order to eliminate any possibility of failure because of reading difficulties.

All tests were tape recorded under favorable listening conditions and the additional tapes were dubbed from the original. Definite directions were given on the recording, however, a short explanation was prepared to be given to each group before testing in order to orient the children and to get them set for a favorable attitude toward listening.

Each item in the listening, part one, was different in stimulus and response so that children could not follow a set pattern of marking. The first item in each group was a direct stimulus to mark the picture with a certain type of mark such as a cross, a circle, a line through, a line above or below the picture. The second item was to put one of these marks on the picture of the thing that made the recorded sounds, e.g., a barking dog or a familiar enviornmental sounds superimposed on white noise. Each presented a little more difficult listening situation.

The second part of the test was a recorded story "How Bertha Giraffe Lost Her Voice," by Katherine E. Nuttey, taken from the <u>Grade Teacher</u>, June, 1943. This story appealed to children from the first through the sixth grade in a pilot study carried out prior to the present study.

The excellent cooperation of the administrative and teaching staff made it possible to test 375 children at the same time two afternoons, thus eliminating the time of day effect on the testing.

Sound pressure level readings were made in each room before testing. Testing conditions were favorable with a sound pressure level range of ambient noises which was between 54-56 db on a C scale reading. An intoned [a] was recorded on each tape and permitted the investigators to calibrate the level of the stimuli at 70 db. The tests appeared to have a face validity on the small scale pilot study. Further study may determine the need to change a few test items, particularly in the auditory discrimination test. It appears that the tests have measured the active listening ability of elementary school children in a more efficient manner than the auditory discrimination for sounds.

APPENDIX B

LISTENING ABILITY

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APPENDIX C

TALK TO THE TEACHERS MEETING

This study is a follow-up of the experiment that you took part in last fall here at the school. As you will recall, the experiment was done by Dr. Edwards and her methods class from Michigan State University. They attempted to find the listening ability of students through a listening test of pictures and a story. They tested the discrimination ability of the students through a discrimination picture test. At that time the staff allotted time in the afternoon for the tests.

In this follow-up experiment, we are asking the fourteen teachers whose classes were involved in the original experiment to donate fifteen minutes of their time for a further evaluation of listening. This time will be arranged during your classes' library period during the week of May 7, 1962. As your class comes to the Library, Mr. Chapman, principal, has requested that I see you then in the room next to his office.

The information I will be seeking at the time of my visit is your estimation of the child's listening ability. By his listening ability is meant listening within these limits:

- 1. Large group situations,
- 2. Small group situations,
- 3. Playground situations,
- 4. Interaction with other children.

When someone attempts to stimulate him in the above situations, how does he respond? Do you have to call him once or several times before he responds? And so forth.

During my fifteen minute visit with you I will give you a sheet like this (see Appendix B) which will have each of your students' names typed on it. The zero marks the average listening ability with three points above and three points below it.

I will give you more information about the sheet at the time of my visit.

Are there any questions? Thank you.

APPENDIX D

INSTRUCTIONS

This Listening Ability Scale (Appendix B) has all of your students' names on it and I would like for you to rate, as objectively as possible, their listening ability. As you may recall last Thursday, I explained that by listening ability I meant listening within these limits:

- 1. Large group situations,
- 2. Small group situations,
- 3. Playground situations,
- 4. Interaction with other children.

When someone attempts to stimulate him in the above situations, how does he respond? Do you have to call him once or several times before he responds? And so forth.

And now a brief look at the scale. The zero marks the average listening ability and there are three points above and three points below the average mark. If a student is better than an average listener, how much better? One plus, two plus, etc. If he is a poor listener, how much below the average is he? Minus one, minus two, etc.

I would like to ask that you try to use the full width of the scale in doing this task. Again, thank you.

APPENDIX E

· CODING OF THE VARIABLES

The six variables will appear coded as follows on the Bivariate Frequency Distributions (Appendix F), on the Correlation-Ratio Matrix (Appendix G), and on the Degree of Relationship Between Paired Variables (Appendix H):

1.	Listening picture test:	LP
2.	Listening story test:	LS
3.	Discrimination test:	D
4.	Teacher rating of listing ability:	TR
5.	Intelligence score:	I
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#### APPENDIX G

### Table 1

Grade I	I	А	LP	LS	TR
Α	*				
LP	•35				
LS	•33		•35		
TR	.31		.24	.17	
D	. 28		•33	. 26	.24
	Grade I A LP LS TR D	Grade I       I         A      *         LP       .35         LS       .33         TR       .31         D       .28	Grade I       I       A         A      *         LP       .35          LS       .33          TR       .31          D       .28	Grade I       I       A       LP         A      *	Grade I       I       A       LP       LS         A      *

#### CORRELATION-RATIO MATRIX

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CORRELATION-RATIO MATRIX

NAME OF TAXABLE PARTY.					
Grade ]	I I	А	LP	LS	TR
А	• 55				
LP	• 54	.36			
LS	• 36	.24	•35	_	
TR	• 39	•33	. 24	.17	
D	.17	. 24	. 20	.10	.17

*Achievement scores were not available for Grade I.

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# APPENDIX G--Continued

## Table 3

### CORRELATION-RATIO MATRIX

Grade	III	I	А	LP	LS	TR
A		•37				
LP		•35	.46			
LS		.47	.24	.51		
TR		• 39	.41	.22	. 28	
D		. 50	. 24	.60	• 55	• 39

### Table 4

#### CORRELATION-RATIO MATRIX

Grade IV	I	А	LP	LS	TR
А	• 59				
LP	• 39	.48			
LS	.40	.14	• 54		
TR	•35	•35	.48	.10	
D	.48	.17	.28	.26	.22

### APPENDIX G--Continued

# Table 5

#### CORRELATION-RATIO MATRIX

Grade V	I	A	LP	LS	TR
A	.42				
LP	.24	. 28			
LS	.30	.17	.17		
TR	. 28	.22	.10	.14	
D	.31	.14	.17	.14	. 26

Table 6

CORRELATION-RATIO MATRIX

Grade VI	I	А	LP	LS	TR
A	. 50			-	
LP	• 54	.60			
LS	•57	•36	• 55		
TR	.36	.22	.17	.10	x
D	.69	.36	.63	•57	.14

#### APPENDIX H

### Table 7

#### DEGREE OF RELATIONSHIP BETWEEN PAIRED VARIABLES

Grade	Moderate .50 to .75	Low .25 to .49	Non Predictive .00 to .24
I		I - LP $I - LS$ $LP - LS$ $D - LP$ $I - TR$ $D - I$ $D - IS$	LP - TR D - TR LS - TR
II	A - I I - LP	I - TR $A - LP$ $I - LS$ $LP - LS$ $A - TR$	A - D $A - LS$ $LP - TR$ $D - LP$ $D - I$ $D - TR$ $LS - TR$ $D - LS$
III	D - LP D - LS LP - LS D - I	I - LS $A - LP$ $A - TR$ $D - TR$ $I - TR$ $A - I$ $I - LP$ $LS - TR$	A - LS A - D LP - TR
IV	A - I LP - LS	D - I $LP - TR$ $LP - LS$ $I - LS$ $I - LP$ $A - TR$ $I - TR$ $D - LP$ $D - LS$	D - TR A - D A - LS LS - TR
V		$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	I - LP $A - TR$ $D - LP$ $A - LS$ $LP - LS$ $A - D$ $D - LS$ $LS - TR$ $LP - TR$

### APPENDIX H--Continued

Grade	Moderate	Low	Non Predictive
	.50 to .75	.25 to .49	.00 to .24
VI	D - I $D - LP$ $A - LP$ $I - LS$ $D - LS$ $LP - LS$ $I - LP$ $A - I$	A - LS A - D I - TR	A - TR LP - TR D - TR LS - TR

Table 7--Continued

