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THE EFFECTS OF LISTENING TRAINING
ON ACHIEVEMENT

A Thesis Submitted to the Graduate Division in Partial
Fulfillment of the Requirements for the
Degree of Master of Science

By ⁷⁻⁴⁻⁶⁹

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Pittsburg, Kansas

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ABSTRACT

Reading has long been recognized as a necessary skill but only recently has there been much interest in listening skills even though listening is the most frequently used language activity. Within the past decade many studies have indicated that listening ability correlates highly with intelligence, vocabulary, and report card grades, and some investigators claim that listening training will improve listening ability. If listening ability correlates positively with report card grades then listening training should aid academic achievement.

The present experiment has investigated the effect of listening training on the grade point averages of college freshmen. Since special treatment of experimental subjects can influence the subjects performance an additional control group, called the Hawthorne group, was added to this experiment. This Hawthorne group was given special attention by personal study assignments while the experimental group listened to tape recorded listening exercises. The control group was not told that they were part of the experiment.

An analysis of variance revealed that there was a significant difference among the groups and a further analysis was made and the variability was localized. A significant difference was found between the listening training and control groups but no significant difference was found between the Hawthorne group and either the control group or the

listening training group. Based on these results it is indicated that the Hawthorne Effect and listening training are simply different levels of the same variable.

CHAPTER I

INTRODUCTION

Communication is generally considered to be composed of four skills. Writing and speaking are classified as expressive skills, and reading and listening as receptive or assimilative skills.¹ When the assimilative skills, the media of learning, are not adequately developed, the entire educational process suffers. The importance of reading has long been recognized; but until recently little attention has been given to the development of listening ability. The growing awareness of the importance of listening is resulting in more and more emphasis on listening at the elementary and secondary school levels, and stressed in the communication skills programs at the college level.

Need for the Study. Several educators in the area of communications have advocated listening training as an adjunct to training in our public schools² but few schools have followed the advice. It has been indicated by many

¹Stanford E. Taylor, What Research Says to the Teacher - Listening, American Educational Research Association of the National Educational Association, 1964, p. 15.

²Edward Pratt, "Experimental Evaluation of a Program for the Improvement of Listening," Elementary School Journal, 56:315-20, March 1956, p. 315; Taylor, op. cit., p. 19; Melvin Lubersham, "Can Training in Listening Improve Reading Ability?", Chicago Schools Journal, 43:277-81, March 1962, p. 277; Harold A. Anderson, "Teaching the Art of Listening," School Review, 52:63-67, February 1949, p. 63.

studies that listening training can improve student efficiency in the classroom and enhance the enjoyment of everyday living.³ Since Listening training appeared to be beneficial, the experimenter developed a training program in which all materials were tape recorded and made available to the students in the listening training group.

Delimitations. The study was delimited to students enrolled in General Psychology, course number 155, section 796, fall semester 1968, Kansas State College of Pittsburg. Achievement was delimited to grades received for the one semester in which the experiment was conducted.

Limitations. The instructional material used may have been a limiting factor and possibly affected the results. Thirty per cent of the original sample did not complete the experiment. This was due primarily to a flu epidemic on campus which interfered with the administration of the standardized tests which were an essential part of this study. There was undoubtedly a certain amount of interaction among the groups since all subjects were selected from the same class. It is further assumed that subjects in one group would have friends or associates in another group. Because of these factors, some subjects in the two

³Lubershame, loc. cit.; Taylor, op. cit., p. 18; Sue E. Trivette, "The Effect of Training in Listening for Specific Purposes," Journal of Educational Research, 54:276-77, March 1961, p. 276; Arthur W. Heilman, "An Investigation in Measuring and Improving Listening Ability of College Freshmen," Speech Monographs, 18:302-8, November 1951, p. 307.

nonexperimental groups received the effects of the experimental treatment vicariously. A further limiting factor was the operation of the experimental condition. The language laboratory where the experimental group listened to the tape recorded lessons was operated by students who did not fully understand or appreciate the project. Record keeping was inadequate and some of the materials were occasionally unavailable due to misplacement or erasures.

Hypothesis. The hypothesis was that there would be no significant difference at the .05 level in achievement between a group of college students receiving listening training and a group which did not receive the training.

Definition of Terms. The term "program" refers to the training exercises and the method of presentation. Listening instruction means the presentation of the training exercises which consisted of oral selections presented by tape. These exercises, or lessons, either posed a problem to be solved or a task to be performed. Correct answers were provided five seconds after each item to provide knowledge of results. Achievement was defined as each student's grade point average for the fall semester, 1968. Expressive skills were defined as skills necessary to impart information to others. Assimilative skills were defined as the skills necessary to receive information from others. Communication is the sum total of both expressive and assimilative skills. When people realize they are experimental

subjects, they begin to act differently, and the difference may affect the experiment.⁴ This was called the Hawthorne Effect and it was defined as the change in performance due to any special treatment of the subjects.

⁴Paul B. Horton and Chester L. Hunt, Sociology, McGraw-Hill Book Company, New York, 1964, p. 28.

CHAPTER II

REVIEW OF LITERATURE

The general consensus among those studying the effects of listening comprehension has been that students who were trained to listen attained greater achievement in school than those who did not receive training. Studies as far back as 1928 indicated that the stress in school was in reading ability with little if any concern about listening ability.¹ Pratt claimed that the development of adequate listening ability had been neglected in our schools.² Anderson agreed that it was unfortunate indeed that listening was one of the most neglected topics in school curriculum.³ According to Taylor, in every study reported in which listening instruction had been given, pronounced gains were made in listening and often in allied communication skills as well.⁴ In 1934, Corey entered a dissenting view when he wrote that it would appear questionable to insist that

¹R. D. Russell, "A Comparison of Two Methods of Learning," Journal of Educational Research, 18:235-38, 1928.

²Edward Pratt, "Experimental Evaluation of a Program for the Improvement of Listening," Elementary School Journal, 56:315-20 March, 1956.

³Harold A. Anderson, "Teaching the Art of Listening," School Review, 52:63-67, February, 1949.

⁴Stanford E. Taylor, What Research Says to the Teacher-Listening, American Educational Research Association of the National Education Association, 1964, p. 3.

students master a relatively new technique which would only be used as a college tool. He claimed that the lecture method of teaching developed out of a shortage of printed material and the necessity for listening was declining as more and more textbooks were becoming available.⁵ This was apparently widely accepted as true since there was practically no experimentation done in the field of listening until the late 1940's.

However, Loder maintained an interest in listening ability and in 1937 he conducted an experiment in which identical material was presented to two groups. The material was presented to one group in the normal manner with the lecturer present at the front of the room. The other group received the same information but the lecturer was not visible, the material being presented by means of a loudspeaker. It was found that students retained a higher percentage of material learned over a loudspeaker compared with a lecturer presenting the material directly,⁶ but this apparently did not arouse much interest. It was not until 1946 when Hatfield conducted an experiment in which he trained students to listen, that any significant change in

⁵S. M. Corey, "Learning From Lectures vs. Learning From Reading," Journal of Educational Psychology, 25:459-70, September, 1934.

⁶E. J. Loder, "A Study of Aural Learning With and Without the Speaker Present," Journal of Experimental Education, 6:46-60, 1937.

attitude was noticed. He attempted "to develop in each listener the power to evaluate each contribution or argument as it is presented, holding in mind, as in reading, a connected exposition or argument, those that are significant."⁷ His results were not statistically significant but he offered a list of goals for listeners which he hoped would stimulate further analyses.⁸

R. G. Nichols accepted the challenge and in 1948 conducted a series of experiments using freshmen students at the University of Minnesota as subjects. Ten minute excerpts were taken from full-period lectures which had been presented in freshmen classes at the university. Twenty multiple-choice questions were constructed to cover the contents of these six lecture excerpts.⁹ He found that several factors influenced the ability to listen. Intelligence correlated .54 with listening comprehension and was considered to be an influencing factor. The correlation between high school grades and listening comprehension was .28 and was considered to be unimportant.¹⁰ Among other important factors were the size of vocabulary, ability to

⁷W. W. Hatfield, "Parallels in Teaching Students to Listen and to Read," English Journal, 35:553-58, December, 1946, p. 558.

⁸Ibid., p. 555.

⁹R. G. Nichols, "Factors in Listening Comprehension," Speech Monograph, 15:2, 1948, p. 156.

¹⁰Ibid., p. 160.

structuralize a speech, listening for main ideas, and recognition of correct English usage.¹¹

This study was followed in 1949 by Adams and Brown. Working independently, they found that most of an adult's waking hours are spent in listening. By having subjects keep a personal record they determined that seventy per cent of the waking time was spent in some form of communication and of that seventy per cent, nine per cent involved writing, sixteen per cent reading, thirty per cent speaking, and forty-five per cent listening. The question they raised was if such a large portion of communication time was spent listening, how effectively do people actually listen, and can listening training be beneficial?¹² Part of this question was answered in 1951 when Heilman designed a series of training units for improving listening ability. He used six training units and the material was tape recorded. The lessons were twenty minutes long and were presented once a week for six weeks.¹³ He found that listening ability of college students can be significantly improved through a program of training in listening, that improvement in listening habits,

¹¹Ibid., p. 161.

¹²Harlen M. Adams, "Learning to Be Discriminating Listeners," English Journal, 36:11-15, January, 1947, p. 12; J. I. Brown, "Why Not Teach Listening," School and Society, 69:113-16, February 12, 1949, p. 114.

¹³Arthur Heilman, "An Investigation in Measuring and Improving Listening Ability of College Freshmen," Speech Monographs, 18:302-308, November, 1951, p. 302.

resulting from special listening training, will transfer to other communication skills, and that there was a positive correlation of .56 between listening ability and intelligence and a correlation of .66 with reading ability.¹⁴

Blewett performed an experiment similar to Heilman, and found a positive correlation only between listening ability and vocabulary.¹⁵ Lewis and Nichols found results similar to Blewett's and believed that we are limited more by poor vocabulary in speaking and listening than in writing and reading. A broad vocabulary for ready reference is thus imperative to us as either speakers or listeners.¹⁶ Wiksell agreed that listeners often have extensive visual vocabularies but find themselves unfamiliar with words in auditory situations. The listener with a good vocabulary can recognize the exact meaning the speaker wishes to convey.¹⁷ At the University of Minnesota, Nichols and Stevens ran a series of tests to see if there was a difference between the listening ability of males and females. The females had the higher average intelligence scores but on the listening test

¹⁴Ibid., p. 307.

¹⁵Thomas T. Blewett, "An Experiment in the Measurement of Listening at the College Level," Speech Monograph, 18: 174-75, August, 1951, p. 174.

¹⁶Thomas R. Lewis and Ralph G. Nichols, Speaking and Listening, Wm. C. Brown Company, Dubuque, Iowa, 1965, p. 108.

¹⁷W. A. Wiksell, "Problems of Listening," Quarterly Journal of Speech, 32:505-8, December, 1946, p. 507.

they found that 95 out of 100 males were better listeners than the females. His only explanation for this was that females were better in expressive skills than males.¹⁸

Pratt found results consistent with Heilman and with Nichols in that only a few training exercises could produce a significant increase in listening ability. He used only five lessons directed toward specific abilities. The analysis of covariance of listening achievement adjusted for listening ability as determined by a pre-test, shows an F value of 13.99 between the listening training and control groups which was significant at about the one percent level.¹⁹ Pratt also found a correlation of .66 between listening ability and intelligence which is comparable to the findings of the other investigators mentioned. This correlation is in line with the correlation of intelligence and other academic abilities.²⁰

How effectively do people listen? Nichols and Stevens claimed that, "on the average we listen at approximately a twenty-five per cent level of efficiency without training; but since listening is a skill, it can be improved through training and practice."²¹ A later study by Taylor indicated

¹⁸R. G. Nichols and Leonard A. Stevens, Are You Listening, McGraw-Hill Book Company, Inc., New York, 1957, p. 11.

¹⁹Pratt, op. cit., p. 318.

²⁰Ibid., p. 321.

²¹Nichols and Stevens, op. cit., p. ix.

that fourth graders comprehended twenty-one to thirty per cent of what they heard and remembered fifty per cent of what they comprehended.²² In a study involving fifth grade students, specific training was given in listening for main ideas, details, and information. Gains in these skills were significant and appeared to transfer to other skills such as following directions and understanding word meaning.²³

Lubershame found significant gains in ability as shown by standardized tests in a group of eighth grade students who had been given a series of taped lessons designed to improve both listening and reading skills.²⁴

With respect to length of lessons, abundant research has been published to show that most people can give satisfactory attention to a speaker whose discourse is no longer than fifteen to twenty minutes. Most untrained listeners have not developed the singleness of purpose nor the techniques to enable them to concentrate longer.²⁵

Taylor stated that in the primary and intermediate grades, listening abilities are more advanced than reading

²²Taylor, op. cit., p. 4.

²³Sue E. Trivette, "The Effect of Training in Listening for Specific Purposes," Journal of Educational Research, 54: 276-77, March, 1961, p. 276.

²⁴Melvin Lubershame, "Can Training in Listening Improve Reading Ability?", Chicago Schools Journal, 43:277-81, March, 1962, p. 277.

²⁵Lewis and Nichols, op. cit., p. 35.

skills. By the sixth or seventh grades, reading ability caught up with listening and reading became the more preferred way of gaining information.²⁶ In situations in which the student could easily cope with the content by listening, he nearly always preferred to do so. But when the content taxed his listening skill, he preferred reading.²⁷ Lewis and Nichols agreed with Taylor and added that listening was the easiest way to acquire needed information. "Even if listening is hard, it is still the easiest way yet found to learn most of the things we shall need to know in our lifetimes. A lecturer, for instance, has probably spent weeks reading, studying, assembling, screening, and organizing, and by listening to his presentation effectively we could save hours of reading time and effort."²⁸

In our society, reading and listening constitutes the basic tools of learning as well as the prime media of social intercourse. In the fulfillment of these roles, the importance of reading has never been questioned. More recently, the significance of listening is receiving increased attention. However, poor listening has apparently led to inefficiency, misunderstanding, and conflict, and it would appear that the spoken word was a dangerous instrument of

²⁶Taylor, op. cit., p. 16.

²⁷Ibid., p. 18.

²⁸Lewis and Nichols, op. cit., p. 25.

communication.²⁹ Compared with the written word, the spoken word has greater persuasive power because, among other reasons, listeners are more vulnerable than readers.³⁰

In reading one may stop, look back, and deliberate. Listening necessarily goes on at the pace of the speaker.³¹ Improved listening would, of course, enable students to understand and learn more effectively the materials offered by those responsible for their training.³²

According to Canfield, listening comprehension was related more closely to report card grades than to any other aspect of the learning process,³³ so, to quote J. I. Brown, "Without minimizing the recognized importance of reading, why not recognize equally the importance of listening? Why not teach listening?"³⁴ To help answer this question Brown, in conjunction with Robert Carlsen, constructed the Brown-Carlsen Listening Comprehension Test. This test was

²⁹Donald E. Bird, "Have You Tried Listening?", Journal of the American Dietetic Association, 43:225-30, March, 1954, p. 226.

³⁰Taylor, op. cit., p. 15.

³¹J. I. Brown, "Why Not Teach Listening," School and Society, 69:113-16, February 12, 1949, p. 114.

³²Washington State Speech Association, Guidebook for Teaching Speaking and Listening in the Senior High School, University of Washington Press, Seattle, 1960, p. 10.

³³G. Robert Canfield, "How Useful Are Lessons on Listening," Elementary School Journal, 62:146-51, December, 1961, p. 151.

³⁴Brown, op. cit., p. 116.

designed specifically to measure listening comprehension and was not merely a part of another test,³⁵ as is the case of the Sequential Tests of Educational Progress: Listening.³⁶ The listening comprehension test devised by Brown and Carlsen has been used for research studies in the language arts department at the University of Minnesota by Brown³⁷ and by Nichols.³⁸ The Brown-Carlsen Listening Comprehension Test was constructed with two alternate forms and two techniques were used to determine reliability. This split half technique yielded a Spearman coefficient of .86 and the correlation between alternate forms was .78.³⁹ In developing equivalent forms of the test, item analysis was used and non-functioning items were eliminated until the distributions of both forms conformed as closely as possible. For both forms, the standard error of measurement was found to be five points and the standard deviation was thirteen.⁴⁰ Group norms in the form of raw scores, percentiles, and I.Q.

³⁵J. I. Brown and G. Robert Carlsen, Brown-Carlsen Listening Comprehension Test, Harcourt Brace and World, Inc., New York, 1955, p. 1.

³⁶Oscar K. Buros, The Sixth Mental Measurements Yearbook, The Gryphon Press, New Jersey, 1965, p. 968.

³⁷Brown, op. cit., p. 1.

³⁸Nichols and Stevens, loc. cit.

³⁹Brown and Carlsen, op. cit., p. 13.

⁴⁰Ibid., p. 14.

equivalents have been tabulated by Brown and Carlsen.⁴¹

The correlations of the Brown-Carlsen Listening Comprehension test with various standardized intelligence tests, such as the Otis Quick Scoring Mental Ability Test, are on the order of 0.7.⁴² The Otis test, in turn, has a high reliability coefficient of .90 and a validity coefficient, based on a small sample of only 100 subjects, of .61.⁴³ Since the Otis test correlates highly with a listening comprehension test and in light of the high reliability and validity coefficients, the Otis intelligence test would seem to be an adequate test for equating groups in a listening training experiment.

Finally, a methodological criticism should be considered. None of the preceeding experiments controlled for the factor of special attention to experimental subjects. During the experiments conducted by the Western Electric Company at their Hawthorne plant, it was found that a change in lighting level, with either brighter or dimmer lights, was followed by a temporary gain in work output. Lighting level was not one of the original variables being investigated, but when new lights were installed, work output increased and this was the expected reaction. However, when

⁴¹Ibid., p. 15-16.

⁴²Ibid., p. 17.

⁴³Arthur S. Otis, Otis Quick-Scoring Mental Ability Tests, World Book Company, New York, 1954, p. 6.

one of the lights burned out there was still another increase in work output.⁴⁴ Thus, the only factor associated with work output seemed to be illumination changes which workers interpreted as special attention and this change in output due to special attention was later named the Hawthorne Effect. This Hawthorne Effect was controlled in this experiment.

⁴⁴Paul B. Horton and Chester L. Hunt, Sociology, McGraw-Hill Book Company, New York, 1964, p. 28.

CHAPTER III

RESEARCH DESIGN

Subjects. The subjects for the experiment were freshman students enrolled in General Psychology 155, section 796, Fall semester 1968, at Kansas State College. The subjects were assigned to three groups of twenty-five each. The control group was composed of twelve males and thirteen females. The experimental group was composed of eleven males and fourteen females. The Hawthorne group was composed of fourteen males and eleven females. There was a thirty per cent loss of subjects due to a flu epidemic during the administration of the Brown-Carlson Listening Comprehension Test,¹ and the Otis Quick-Scoring Mental Abilities Test.² There were seventeen female subjects lost, six in the Hawthorne group and five each in the control and experimental groups. Three male subjects were lost from the Hawthorne group due to the flu and one subject refused to participate. One male subject assigned to the control group dropped out of school, and there were no male losses in the experimental group.

¹J. I. Brown and Robert Carlson, Brown-Carlson Listening Comprehension Test, Harcourt, Brace, and World, Inc., New York, 1955.

²Arthur S. Otis, Otis Quick-Scoring Mental Ability Test, World Book Company, New York, 1954.

Subjects were assigned to the three groups on the basis of numbers on the Brown-Carlson Listening Comprehension Test, Form Am, which was given as a pre-test. The tests were numbered sequentially and then shuffled. The test numbers were assigned to the three groups by using a table of random numbers. It was predetermined that the first number chosen would be the control group, the second would be the Hawthorne control group, and the third would be the experimental group.

Equipment. The facilities of the Language Listening Laboratory at Kansas State College were made available for the presentation of the training program.³ The listening laboratory contained thirty-one tape recorders and there was always an adequate number of machines available. The program was recorded at 3 3/4 i.p.s. on three-inch reels of magnetic tape. The tapes were color-coded and numbered to indicate content.

Materials. To establish the degree of equality between groups, three standardized tests were given to all subjects participating in the experiment. The Brown-Carlson Listening Comprehension Test, Form Am was given as a pre-test to determine the level of listening comprehension at the

³We wish to express our appreciation to Dr. Turk-Roge, acting Chairman of the language department, for allowing us to use the department's laboratory equipment for this experiment.

beginning of the experiment.⁴ At the conclusion of the experiment, the equivalent form Bm of the test was given to the subjects who had completed the experiment. Since intelligence was considered to be an influencing factor the Otis Quick-Scoring Mental Abilities Test was given. This test was selected because of its applicability for research purposes.⁵ Any subject not taking all three tests was dropped from the experiment.

The material presented to the experimental group was organized into four units of nine lessons each and was designed to elaborate on the Brown-Carlson Listening Comprehension Test items. Each lesson was tape recorded and contained three basic parts; instructions, learning exercise, and test items. Each unit was designed with a specific goal in mind. Unit One was designed to strengthen rote memorization and required immediate recall of number and word sequences by the subject. Unit Two emphasized remembering names, places, and things which were included in short paragraphs of from twenty-five to 150 words in length. These were taken primarily from associated press articles and from newspapers.⁶ Unit Three was a series of short lectures of

⁴Brown and Carlson, loc.cit.

⁵Otis, op. cit., p. 6.

⁶Associated Press Wire Service, Featurscope, June 1968-September 1968.

from 100 to 500 words in length which defined the need for listening, identified what makes a good listener, and included instructions on how to take notes from a lecture. Unit Four consisted of longer passages of informative prose which were taken from a standard reading text, and were from 1500 to 2000 words in length.⁷ These units are basically a combination of four studies mentioned previously and are comparable to them in length and type of material used. Pratt⁸ used five lessons directed toward specific abilities, (cf. Unit I); Nichols⁹ used six lessons composed of lecture excerpts, (cf. Unit III); Heilman¹⁰ used six lessons and used twenty minute selections of prose (cf. Unit IV); Unit II was designed by the experimenter and the material is available on request.

Unit One was recorded by the experimenter since the control of timing sequences was important. Various other voices were used throughout the remaining three units. Both

⁷Paul Witty, How to Become a Better Reader, Science Research Associates, Inc., Chicago, Illinois, 1953, pp. 186 to 297.

⁸Edward Pratt, "Experimental Evaluation of a Program for the Improvement of Listening," Elementary School Journal, 56:315-20, March 1956, p. 319.

⁹R. G. Nichols, "Factors in Listening Comprehension," Speech Monographs, 15:2, 1948, p. 156.

¹⁰Arthur W. Heilman, "An Investigation in Measuring and Improving Listening Ability of College Freshmen," Speech Monographs, 18:302-8, November 1951, p. 302.

male and female voices were used, four males and six females, and they were assigned at random to the various lessons. Poor readers were used as well as more accomplished readers and an effort was made to obtain readers with various accents so the subjects would be acquainted with different types of listening situations. This was accomplished by the use of two foreign students and a student with a Southern United States accent.

Procedure. When presenting the pre-test in listening comprehension to the subjects they were told that some of them would be selected to participate in an experiment. After selection the experimental group was assigned to go to the language laboratory at their convenience and to check out the tape recorded lessons and listen to them using one of the machines available in the laboratory. They were not permitted to take a taped lesson from the room. They were told that they must complete all thirty-six lessons before the Christmas vacation and that if they desired they could listen to any lesson more than once. The subjects in the Hawthorne group were required to keep a record of the amount of time they spent studying and sleeping for ten days during the first part of the experiment and for ten days at the end of the experiment and present this data to the experimenter for use in future studies. This gave them a certain extra amount of special attention since they had to perform some task and were reminded to complete the study on time.

Students in the control group attended classes as usual and were not permitted to use the programmed tapes. According to all laboratory records, no one other than experimental subjects tried to use any of the experimental materials. The subjects in the control group were not told that they were part of the experiment in any whatsoever. However, a discussion of experimental design is included in most general psychology courses and the importance of control groups are stressed so it is to be expected that some, subjects in the control group suspected their role.

Analysis. An analysis of variance was used to determine if the three groups were statistically equal at the beginning of the experiment. The analysis was based on two tests, the Brown-Carlson Listening Test, Form Am, given as a pre-test and the Otis Quick-Scoring Mental Ability tests, Gamma Form, as a measure of intelligence.

It was necessary to determine if the materials presented to the experimental groups were valid so as a pre-test, the Brown-Carlson Listening Comprehension Test, Form Am was given followed by the equivalent Form Bm at the end of the experiment. Both forms of the test were given to all three groups and an analysis of variance of difference scores was used to determine if there was any significant variability among the groups.

The dependent variable in the experiment was academic achievement so grade point averages for the one semester

were obtained for each subject completing the experiment in each of the three groups. An analysis of variance was used to determine if there was any significant variation among the groups with respect to achievement.

The Scheffe method for a planned-comparison was made wherever a significant F was found.¹¹

¹¹George A. Ferguson, Statistical Analysis in Psychology and Education, McGraw-Hill Book Company, New York, 1966, pp. 294-98.

CHAPTER IV

RESULTS

To determine if the selection of groups was biased, a pre-test in listening comprehension and an intelligence test were given to all participating subjects. An analysis of variance was used to determine if there was any statistically significant difference among the groups. Table I gives the results of these analyses for the listening comprehension test and Table II provides similar information for the intelligence test. It can be seen that the obtained F values are below the necessary critical level and it was concluded that the three groups were not significantly different with respect to listening ability or intelligence at the beginning of the experiment.

TABLE I

ANALYSIS OF VARIANCE FOR A PRE-TEST
IN LISTENING COMPREHENSION

Source of Variability	SS	df	\overline{SS}	F
Between Groups	161.05	2	80.53	1.228
Within Groups	3209.86	49	65.55	
Total	3370.92	51		

TABLE II

ANALYSIS OF VARIANCE FOR INTELLIGENCE

Source of Variability	SS	df	SS	F
Between Groups	43.56	2	21.78	0.220
Within Groups	4843.21	49	98.84	
Total	4886.77	51		

It was also necessary to determine if the training materials were appropriate or useful. To determine the usefulness of the training materials, the alternate form, Bm of the Brown-Carlson Listening Comprehension Test, was given to all subjects at the conclusion of the experiment. An analysis of variance was used to determine if there was any overall variation in the difference in scores obtained between the two alternate forms. Table III shows this analysis. The F value was significant so a planned-comparison was made of the groups to determine the source of variability. A significant difference was found between the experimental and control groups, $F = 7.72$; $p < .05$. There was no significant difference between the Hawthorne group and the control group, $F = 3.02$; $p > .05$, nor was there any significant difference found between the Hawthorne and experimental groups, $F = 3.04$; $p > .05$.

The dependent variable for this experiment was the

overall grade point averages at the end of the semester for all subjects. Table IV shows the analysis of variance for the grade point averages for the three groups.

TABLE III

ANALYSIS OF VARIANCE OF LISTENING COMPREHENSION
DIFFERENCES SCORES

Source of Variability	SS	df	\overline{SS}	F
Between Groups	537.84	2	268.92	9.642**
Within Groups	1366.83	49	27.89	
Total	1904.67	51		

TABLE IV

ANALYSIS OF VARIANCE OF GRADE POINT AVERAGES

Source of Variability	SS	df	\overline{SS}	F
Between Groups	2.989	2	1.495	3.205*
Within Groups	22.858	49	.467	
Total	25.846	51		

* $p < .05$

** $p < .01$

Note: The raw data from which these analyses of variance were computed can be found in Tables V and VI in the Appendix.

As can be seen, the F value is significant, $F = 3.205$; $p < .05$. A planned-comparison evaluation was used to determine the source of variability. A significant difference was found between the experimental and the control group, $F = 6.166$; $p < .05$, but none between the Hawthorne and control group, $F = 2.809$; $p > .05$, nor between the Hawthorne and experimental group, $F = 0.4349$; $p > .05$. These results indicate that listening training affects academic achievement as measured by grade point averages since there was a significant difference between the experimental and control groups. There was no significant difference between the Hawthorne and control group nor was there a significant difference between the Hawthorne and experimental groups, indicating that no other planned comparisons were significant.

CHAPTER V

DISCUSSION

The purpose of this experiment was to determine if a program of listening training would be beneficial in terms of academic achievement to freshmen students at Kansas State College. The subjects for the groups were randomly selected from one general psychology class. To determine if the groups were biased in terms of listening ability or intelligence, a pre-test in listening comprehension and an intelligence test were given to all participating subjects. The analysis of the results of these tests indicated that the groups were not significantly different at the beginning of the experiment.

If listening training improves academic achievement then the training materials must be effective, that is, the lessons presented must improve listening ability. To evaluate this expected improvement in listening ability, the Brown-Carlson Listening Comprehension Test¹ was used. This test was available with two equivalent forms and since the form Am had been used as a pre-test for determining inter-group equivalence, the form Bm was used to determine if

¹J. I. Brown and G. Robert Carlson, Brown-Carlson Listening Comprehension Test, Harcourt, Brace, and World, Inc., New York, 1955.

training improved the listening comprehension of the experimental group. Results showed that a significant change occurred and it was concluded, on this basis, that the training materials were effective.

The dependent variable in this experiment was academic achievement, measured by obtaining grade point averages for each student. The analysis of variance of these averages indicated a significant difference due to the experimental treatment.

As mentioned in Chapter I, the findings of many experiments are due to the attention the subjects are getting, not to the factor which is being tested. In an attempt to account for this effect, a third group, mentioned previously as the Hawthorne control group, was given some amount of special attention. The planned comparisons showed that there was no significant difference in listening ability between the Hawthorne group and the control group, and since there was such a small difference between the Hawthorne and experimental groups in listening ability (cf. Table IV), the indication is that instead of being mutually exclusive, the Hawthorne effect and listening training may be different levels of the same variable.

Although this experiment was quite different from the studies mentioned earlier, there are many points of

comparison. Pratt² used five lessons directed toward specific abilities and this would compare with Unit I of this study. His results were also comparable with the results between the experimental and control groups of this experiment with respect to listening improvement. Nichols,³ in 1948, used six lessons composed of ten minute excerpts from classroom lectures, however, he was not specifically interested in listening training, but he did find high correlations between listening ability and both intelligence and vocabulary. His source of material appeared useful since college achievement depends a good deal upon lectures so this type of material was incorporated into Unit III of the instructional materials used in this experiment. Heilman⁴ also used six lessons and he increased the length of each lesson to twenty minutes. This corresponds to Unit IV of this study. Heilman indicates a significant improvement in listening ability of college students as a result of listening training and the planned-comparison between the pre-test and post-test on listening comprehension, incorporated in

²Edward Pratt, "Experimental Evaluation of a Program for the Improvement of Listening," Elementary School Journal, 56:315-20, March 1956, p. 319.

³R. G. Nichols, "Factors in Listening Comprehension," Speech Monographs, 15:2, 1948, p. 156.

⁴Arthur Heilman, "An Investigation in Measuring and Improving Listening Ability of College Freshmen," Speech Monographs, 18:302-8, November 1951, p. 302.

this experiment, agreed with Heilman's findings.

Special treatment or attention has been shown to influence experimental results and it is quite evident that previous studies of listening training have not taken this factor into account.⁵ Since the Hawthorne effect is undoubtedly present in all such investigations and since its influence was not considered, the positive results found in previous listening training experiments must be questioned. The present study attempted to control for the Hawthorne effect by adding an additional control to more accurately evaluate listening training. As seen in the results, the experimental group was significantly better in both listening ability and achievement than the control group, but when the experimental group was compared with the Hawthorne control group, there was no significant difference between the groups on either listening ability or achievement. In fact, if the data from the experimental group could be adjusted for the Hawthorne effect, the significant results may not have been found.

It is quite possible that listening training is nothing more than the Hawthorne effect. If this is the case, then any adequate amount of special attention should have the same effect. The effectiveness of listening training has been inconclusive and the advisability of instituting a

⁵Paul B. Horton and Chester L. Hunt, Sociology, McGraw-Hill Book Company, New York, 1964, p. 28.

listening training program is an issue requiring further investigation. J. I. Brown's⁶ question, "Why not teach listening?" is still unanswered.

⁶J. I. Brown, "Why Not Teach Listening?", School and Society, 69:113-16, February 12, 1949, p. 116.

CHAPTER VI

RECOMMENDATIONS

Even though the results showed that three groups differed significantly in terms of Grade Point Average it would be highly desirable to conduct further studies in the area of listening comprehension before initiating an academic program of listening instruction. The sample was far too small and the experimental situation was too unstructured to place much reliability on the results. The close relationship between the Hawthorne and experimental groups seems to indicate that perhaps the only facilitating effect is special attention. This should be investigated further. The comparison between pre-test and post-test, as evaluated by the Brown-Carlson Listening Comprehension test indicates that the materials used in the experiment have a definite positive value and if a listening training program should prove feasible, these materials could be used with only minor revisions. These revisions would be in Unit II where current news topics were predominant.

This study does indicate, as does other research cited, that listening training per se may be a valuable asset to most college students.

APPENDIX

TABLE V

RAW SCORES FOR BROWN-CARLSEN LISTENING COMPREHENSION
PRE-TEST AND POST-TEST

Experimental			Hawthorne			Control		
Am	Bm	D	Am	Bm	D	Am	Bm	D
60	55	-5	38	48	10	54	55	1
50	52	2	54	57	3	54	62	8
37	45	8	36	48	12	56	50	-6
61	62	1	57	62	5	56	46	-10
40	52	12	39	37	-2	55	57	2
32	40	8	45	57	12	48	50	2
52	59	7	57	61	4	42	54	12
49	55	6	55	57	2	58	46	-12
40	55	15	63	59	-4	60	57	-3
50	56	6	42	49	7	39	38	-1
44	50	6	52	54	2	56	60	4
57	64	7	50	56	6	56	56	0
47	46	-1	45	56	11	56	63	7
53	56	3	56	55	-1	52	55	3
52	64	11	38	42	4	48	59	11
40	51	12				56	57	1
53	58	5				39	45	6
34	53	19						
50	49	-1						
63	65	2						
\bar{X} 48.2	54.4	6.15	48.5	53.2	4.73	52.1	53.53	1.47

TABLE VI

RAW SCORES FOR LISTENING COMPREHENSION PRE-TEST,
INTELLIGENCE, AND GRADE POINT AVERAGES

Experimental			Hawthorne			Control		
Am	Otis	G.P.A.	Am	Otis	G.P.A.	Am	Otis	G.P.A.
60	119	3.313	38	109	2.125	54	113	2.277
50	105	.933	54	118	2.647	54	110	2.200
37	95	2.250	36	97	1.974	56	114	.333
61	117	3.000	57	109	2.867	56	108	2.500
40	101	2.385	39	90	1.563	55	120	1.467
32	92	1.933	45	120	2.313	48	107	1.077
52	130	2.958	57	104	2.500	42	104	1.935
49	104	1.739	55	114	1.907	58	123	3.162
40	104	3.063	63	118	3.110	60	113	2.133
50	121	3.216	42	101	2.015	39	93	1.342
44	115	2.600	52	117	2.765	56	115	2.625
57	114	2.653	50	116	2.133	56	107	2.615
47	110	3.200	45	102	1.800	56	119	2.571
53	119	3.438	56	120	2.981	52	112	1.625
52	122	1.625	38	94	2.214	48	112	2.600
40	100	2.596				56	110	.200
53	114	2.889				39	86	2.013
34	97	1.500						
50	109	2.400						
63	129	1.938						
\bar{X} 48.2	110.9	2.481	48.5	108.6	2.327	52.1	109.8	1.922

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