A COMPARISON OF TWO METHODS OF LISTENING AND READING TRAINING IN AN EIGHTH GRADE LANGUAGE ARTS PROGRAM

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CHAPTER I

INTRODUCTION

The field of instructional technology has received much interest from researchers and authors in the fields of education and psychology. The impact of the "Space Age" upon teaching methods and procedures can be seen through the increased search for newer, more effective methods of presenting materials to students. Additional interest has been aroused in the instruction of the basic processes of communication, so that the modern day student may be better able to gain an understanding of the more advanced technology of our times.

An acute problem in education is the increasing need for "quantity education" and "quality education." The motivations underlying mass education have given impetus to searching for instructional methods which would give wide and efficient utilization of materials presented to students. Of equal importance were the attempts to define and describe instructional methods which would serve to safeguard the quality of education through effective and meaningful development.

The Listen and Read Program (13) is a new attempt to provide an effective method of learning which can be readily adaptable for instruction in the basic communicative skills of listening and reading. The principles of learning and the psychological concepts underlying the development of this program were brought into perspective by research in three main areas: the relationship between the communicative processes of listening and reading, programed learning, and the development and use of language laboratories.

The relationship between the two processes of listening and reading has been of basic concern in investigations of these two communicative skills. Although reading has received most of the interest, efforts have been made in the area of discovering expedient and effective methods for listening instruction. Recently, because of commonalities between these two receptive skills, it has been suggested that instruction between the two be integrated, permitting transfer from one to the other (2). Leaders in the field of reading discovered years ago that a child learned to read to the extent that he could bring experiences and intelligent thought to the task at hand. A similar awakening has taken place only recently in the

field of listening. Both listening and reading require that active thinking be applied to symbols heard and read. It is at this point that listening is distinguished from mere hearing and reading from mere seeing. "It is here that we discover the focal point to attack in helping children to listen better. Children need to be assisted to use the proper technique for applying intelligence to that which is heard." (4, p. 175). Preceding studies have suggested that: (a) a listening improvement program designed to improve reading abilities was especially effective for poor readers (3); (b) most students benefited from listening instructions (10); and (c) there was a need to parallel both listening and reading instruction so that they might be mutually reinforcing (1).

Programed instruction has occupied a prominent position in educational research and endeavor over the past five years. With its popularization by Skinner (11), much effort has been spent in general discussion papers, programing experiments, and studies comparing conventional instructional material with programed material (12). Klaw (6) reported that approximately 5,000 commercially produced machines and programs were in use during 1963 throughout our nation, and that more than 100 companies

were engaged in the production of programs and machines. Having summarized the existing information about programed instruction into a very excellent review, Silberman stated, "If the extent of our understanding of the learning process were proportional to the rate of increase in articles on programed learning, most educational problems would be solved within the next decade" (12, p. 179).

The development and use of language laboratories in the nation was stimulated in part by increased public awareness for sound, adequate language instruction and the financial assistance made available through the National Defense Education Act of 1958 (5). Mathieu (7), following an intensive survey of the use of language laboratories, reported that in 1950 approximately 100 colleges and universities had some kind of language-laboratory facilities; however, in 1957 the number had increased to sixty-four installations in secondary schools and 240 installations in colleges and universities. In the same report, it was estimated that a United States Office of Education survey in 1962 would reveal that more than 2,500 secondary schools would have some kind of language laboratory. Most proponents of the language laboratory have attributed its success to the methods and

materials, rather than the equipment itself (7). However, staunch advocates of the language laboratory technique felt that it could do more than just present programed material, and that it should be utilized in the presentation of materials in other instructional fields (3).

The Listen and Read Program, utilizing research findings in these three areas of instruction of listening and reading, programed learning, and language laboratories, appeared to be an effective means whereby instruction in the language arts program of the public schools might be benefited.

Statement of the Problem

The purpose of this study was to compare the effects of two methods of listening and reading instruction when used in the language arts program at the eighth-grade level as related to listening, reading, study skills, and English achievement. The following subproblems were involved:

1. To determine any significant differences in achievement gain with respect to listening, reading, study skills, and English improvement between an experimental group receiving programed material presented by the Listen and Read Program and a control group receiving instruction through the regular classroom program; and

2. To determine any significant differences in achievement gain with respect to listening, reading, study skills and English improvement between high ability students and low ability students in the experimental and control groups.

Hypotheses

In light of the problem the following hypotheses were formulated for this study:

1. There will be a significant difference between the means of listening achievement gain of the two principal groups, with the experimental group tending to achieve more than the control group.

2. There will be a significant difference between the means of listening achievement gain of high ability and low ability students,with low ability students tending to achieve more than high ability students.

3. There will be a significant difference between means of reading achievement gain of the two principal groups, with the experimental group tending to achieve more than the control group.

4. There will be a significant difference between the means of reading achievement gain of high ability and

low ability students with low ability students tending to achieve more than high ability students.

5. There will be a significant difference between means of study skill achievement gain of the two principal groups with the experimental group tending to achieve more than the control group.

6. There will be a significant difference between the means of study skill achievement gain of high ability and low ability students tending to achieve more than high ability students.

7. There will be a significant difference between means of English achievement gain of the two principal groups with the experimental group tending to achieve more than the contol group.

8. There will be a significant difference between the means of English achievement gain of high ability and low ability students with low ability students tending to achieve more than high ability students.

Significance of the Study

School systems have been concerned with empirical evidence to support the use of programs utilizing new methods and techniques of instruction. Not only will this

study add to the body of research in the areas of instruction in listening and reading, programed learning and the language laboratory, but it may enable public school personnel to evaluate the effectiveness of a new method of instruction.

The significance of this study was that it served to evaluate a relatively new method of listening and reading instruction in particular areas when integrated into a regular language arts program on the eighth-grade level.

If no significant difference between the achievement of the experimental group, taking instruction by the Listen and Read Program, and the control group, taking instruction in the regular language arts program, is found, this study would suggest that the Listen and Read Program provided methods of instruction comparable to those of regular classroom instruction.

If a significant difference between the achievement of the experimental group, taking instruction in the Listen and Read Program, and the control group, taking instruction in the regular language arts program, is found, this study would suggest the possibility of a more effective method of instruction for use in school systems in their attempt to improve their language arts programs.

Definition of Terms

For purpose of this study, the following definitions of terms were made.

1. Listening Achievement Gain.--The amount of progress between pretest and posttest scores as measured by the Brown-Carlsen Listening Comprehension Test, Forms Am-Bm.

2. Reading Achievement Gain.--The amount of progress between pretest and posttest scores as measured by the California Achievement Test--1957 Edition Reading Section, Forms X-Y.

3. Study Skill Achievement Gain.--The amount of progress between pretest and posttest scores as measured by the California Achievement Test--1957 Edition Language Section, Forms X-Y.

4. High Ability Student.--A student whose pretest score ranks in the upper 40 per cent of the distribution of scores for each of the two principal groups, as measured by the California Test of Mental Maturity.

5. Low Ability Student.--A student whose pretest score ranks in the lower 40 per cent of the distribution of scores for each of the two principal groups, as measured by the California Test of Mental Maturity.

Limitations of the Study

The results of this study are limited in application to eighth-grade students of similar backgrounds and abilities to those students involved in the experiment.

Basic Assumptions

The following basic assumptions were made relative to this study.

1. The teacher effect upon student's achievement between the two principal groups was equated by the use of two teachers in regular classroom instruction for the same number of students in either group. One teacher instructed four regular English classes, of which two were in the experimental group and two were in the control group. The other teacher instructed two regular English classes, of which one was in the experimental group and one was in the control group.

2. The instruments used to measure student progress were valid for the purposes of this study, and their administration was in keeping with standardized procedures.

3. Through the random assignment of classes to the experimental group and control group, there were no forces which would make any factors different for one group or the other.

The collection and treatment of data for this study will be reserved for Chapter III. In the following chapter, the literature will be reviewed with respect to three areas: instruction in listening and reading, programed learning and the language laboratory. The evidence from these three fields will suggest the basic principles underlying the development of the Listen and Read Program.

CHAPTER BIBLIOGRAPHY

1. Caffrey, John, "The Establishment of Auding-Age Norms," School and Society, LXX (November, 1949), 310-12.

2. Dow, Clyde W., "Integrating the Teaching of Reading and Listening Comprehension," Journal of Communication, VIII (Autumn, 1958), 118-126.

3. Erickson, Allen, "Can Listening Efficiency Be Improved?" Journal of Communication, IV (Winter, 1954), 128-132.

4. Hampleman, Richard S., "Listening," Education Screen, XXXVII (April, 1958), 175-179.

5. Johnston, Marjorie C., "Foreign Language Instruction," Review of Educational Research, XXXI (April, 1961), 188-196.

6. Klaw, Spencer, "What Can We Learn from the Teaching Machine?" The Reporter, July, 1962.

7. Mathieu, Gustave, "Language Laboratories," Review of Educational Research, XXXII (April, 1962), 169-178.

8. Morton, F. Rand, "On the Advantages of Audio-Lingual Programming," paper read at American Medical Association Special Conference on Teaching Machines and Programmed Learning, Los Angeles, California, November 15-18, 1961.

9. McNemar, Quinn, Psychological Statistics, New York, John Wiley and Sons, 1959.

10. Russell, R. D., "A Comparison of Two Methods of Learning," Journal of Educational Research, XVIII (October, 1928), 235-238.

11. Skinner, B. F., "Teaching Machines," Science, CXXVIII (October, 1958), 969-977.

12. Silberman, Harry F., "Self-Teaching Devices and Programmed Materials," Review of Educational Research, XXXII (April, 1962), 179-193.

13. Taylor, Stanford E., EDL Listen and Read Programs, New York, Educational Developmental Laboratories, 1962.

CHAPTER II

RELATED LITERATURE

The basic concepts underlying the Listen and Read Program are derived from fields of instruction in listening and reading, programed learning, and language laboratories. Pertinent research in each of these three areas will be examined in that order.

Instruction in Listening and Reading

Both listening and reading, as communicative skills, have been the subject of studies of the educative process. However, interest in the reading process has far exceeded interest in the listening process. This has been viewed with concern by writers in the field, who have stressed the point that equal efforts should be expended in examining the listening process. Anderson stated:

> The tragedy lies in the fact that only the eyes are trained. Except in isolated instances, virtually the only instruction in listening that children and young receive in the schools is the quite useless admonition to "pay attention" and to "listen carefully." Listening, at all educational levels, has been the forgotten language art for generations (1,p.216).

An increased interest in the nature of the listening process and in the best procedures for teaching efficient use of this process has marked the past few years. In 1954, the Commission on the English Curriculum strongly emphasized the importance of listening training in the language arts programs of the public schools for the following reasons: (a) listening is the most used of the arts of the language; (b) listening is often poorly done; and (c) listening habits may be greatly improved through training (34). These three reasons were supported by research.

After a lengthy study of the communication skills of adults, Rankin (57) reported that on the average in America, 70 per cent of a "waking day" is spent in verbal communication. Of this verbal communication, he reported that 45 per cent was spent in listening, 30 per cent in speaking, 16 per cent in reading, and 9 per cent in writing. Nichols (50) found that the average person remembers only half of what he hears immediately after listening to someone talk, and two months later, he remembers only 25 per cent of what he heard. Nichols also reported improvement of 25 to 49 per cent in listening ability of students as a result of twelve weeks of listening training.

There were many studies to suggest that listening ability could be improved through instruction. Pratt (55) found significant differences in listening achievement for forty sixth-grade students when five listening lessons were introduced at one week intervals to only twenty of the students. These lessons included accuracy in observing details, listening for clues, following directions, seeing relationships between main ideas and supporting ideas, and making inferences. Wagner (74) summarized the organized listening programs of eight separate school systems which had proven successful in teaching listening. Common methods found in the programs were the use of listening activities in the classroom, questions and answers, and exercises intended to influence the student's attitudes, goals and ideas concerning the meaningfulness of listening. A four-day unit of listening instruction was presented to freshman students at the University of Kansas. Following two days of lectures, one day of progress testing, and a final day of student analysis of personal listening problems, students enrolled in the unit showed significant improvement over a control group (20). Needham (46) summarized the main points of the successful listening program at Chico State College as follows: (a) stressing the importance of

sending and receiving verbal symbols; (b) stressing listening as a means of communication; (c) stimulating self evaluation; and (d) using the aural approach to the study of language. Nichols (49) advocated the following four items for inclusion in a successful varied program of listening training: (a) teacher-student discussion of listening skills; (b) the use of training kits and exercises; (c) teacher workshops on listening; and (d) the use of note taking. Other studies by Canfield (7), Hosey (25), Lewis (37), O'Connor (52), and Smith (70) have supported the effectiveness of a qualified teacher to develop listening ability with proper methods in the classroom. The evidence supporting the effectiveness of listening instruction led Anderson to state:

> It is hoped that teachers at all levels will attack the problems devising effective means of teaching children, young people, and adults how to become better listeners. This can be done only by experimenting with a variety of methods and objectively evaluating their effectiveness (1, p. 222).

As efforts increased in providing adequate listening instruction, interest was also aroused concerning the similarities and differences between the two processes of listening and reading, and how both of these two receptive skills might be developed through the same instructional

program. Anderson felt that training in both skills could be provided since both were receiving ends of the communication process, both were assimilative skills, both were means of extending experiences, both were involved with language, the same words were used in both, sentence patterns were much alike in both, and both skills served the same purposes. Anderson also pointed out several differences. In listening the ear was the receiving organ, and in reading the eye was the receiving organ. In listening the speaker set the pace, and in reading the reader set the pace. It would follow then that in listening there was no reflective process, but in reading there was time for reflective processes. Listening was a socialized activity and reading was more of a personalized activity. In listening both the style of the speech and the personality of the speaker affected the listener, whereas in reading the print on the page was rather impersonal (1).

In separate analyses of the two different skills by different investigators, similarities were noted. In a factorial analysis of reading ability, Langsom (33) identified four significant areas: (a) a verbal factor involving interpretation of ideas; (b) a perceptual factor involving facility in perceiving detail; (c) a word factor involving

fluency in dealing with words; and (d) the seeing of relationships, concerned with logical organization and selection. In a factorial analysis of listening ability, Brown (5) secured from experts in the field a consensus on five significant areas: (a) ability to synthesize the component parts of speech to discover main ideas; (b) ability to distinguish between relevant and irrelevant; (c) ability to make logical inferences about what is heard; (d) ability to make full use of contextual skills; and (3) ability to follow a fairly complex thought unit.

After defining the term "auding" as hearing with interpretation and comprehension, Caffrey (6) studied the relationship between listening and reading. It was found that when auding ability is low, reading ability tends to be low and when auding ability is high, reading ability is not predictable. It was discovered, too, that when reading ability is low, auding ability is not predictable and when reading ability is high, auding ability is more likely to be high. Wepman surveyed eighty first graders and seventy-six second graders and found that "a close relationship exists between auditory discrimination and speech accuracy of articulation . . . and . . . a relationship of importance between poor reading achievement and the auditory

discrimination ability" 75, p. 332). Having studied 690 students in the intermediate grades and junior high school, Russell reported that: (a) fifth-grade students learn more from listening than from reading; (b) seventh-grade students learn equally well from listening or reading; and (c) ninth-grade students learn more from reading than from listening (61).

In an investigation of the relative merits of listening and reading comprehension for boys and girls of primary school age, intelligence tests were administered to 475 subjects enrolled in nine primary schools in London, England. On the basis of these scores, two equal groups were selected, one to receive instruction by listening and one by reading for a lesson and test, following which the methods for both groups were switched for a lesson and test. In comparing test results it was found that the correlations between auditory and visual tests with each other and with the results of the intelligence test was around .80, and that there was a tendency for boys to do better than girls on oral testswith practical and scientific content (29).

In a more extensive survey, the listening and reading comprehension ability of fourth- and sixth-grade students

were compared with respect to differences in mental age, grade level, difficulty of material, length of passage, and sex. Five hundred subjects located in four elementary schools in Macomb, Illinois, participated in the survey. The results of this study were reported by Hampleman (21) as follows:

a. Sixth-grade students were superior to fourth grade students in both listening and reading comprehension.

b. Listening comprehension was significantly superior to reading comprehension for fourth-grade and sixth-grade, boys and girls.

c. Easy material was more readily comprehended than hard material by fourth- and sixth-grade boys and girls.

d. For both grades listening comprehension was significantly greater than reading comprehension more so with easy material than hard material. It appeared that if the material had been even more difficult, reading comprehension would have been superior to listening comprehension.

e. Boys were superior to girls in comprehending the hard material.

f. Varying the length of passages of story-type material produced no apparent differences in the ability to comprehend passages.

g. The length of passage did not appear to alter the relationship between listening and reading comprehension.

h. An increase in mental age and, to a lesser extent, chronological age, decreases the difference between listening and reading comprehension.

Larsen and Feder (36) investigated the relationship of listening and reading comprehension with respect to scholastic aptitude of college freshmen. At this level, they found that a group low in scholastic aptitude was about equal in reading and oral comprehension, and the median group showed some superiority in reading comprehension over listening comprehension. The top group showed significant superiority in reading comprehension. Students high in scholastic aptitude comprehended difficult material better by reading than listening, and easy material almost equally well by either method. Students of low scholastic aptitude did slightly better on listening to easy material.

Nichols (48) presented excerpts from college lectures to 200 college freshman and found that listening comprehension involved more factors than reading comprehension, including intelligence, correct English usage, size of vocabulary, interest, physical fatigue of listener, and

audibility of the speaker. Pratt (55) reported a correlation of .66 between listening ability and intelligence. Hollow (23) found a correlation of .55 between listening and reading ability, and a correlation of .42 between listening and intelligence.

Taylor (73) reported three basic differences between the processes of listening and reading. First, they differed in the manner in which the thought processes were invoked: in listening, by the spoken word and in reading, by the printed word. A second difference between listening and reading was the control of rate of proceeding: in listening, the rate was dependent upon the speaker; in reading, the individual proceeded at his own rate. A third difference was the amount of meaning which could be inferred from the two processes: in listening, the tone, phrasing and emphasis affected the listener; in reading, the print itself had no personality.

Having identified differences and similarities between listening and reading, relatively few efforts were found in the literature in which this knowledge was used to develop effective methods of instruction. Baker advocated the teaching of listening as a functional part of composition in the language arts program.

> We have to face the fact that composition, oral and written, is our chief concern. Therefore, we can ill afford time and effort which does not contribute directly to this end. Our job, then, is not to find out and emphasize the differences among communications skills; it is to stress their relatedness and to show how they all can be used to contribute to an improvement of composition (2, p. 179).

Baker gave four activities through which it would be possible to integrate listening instruction with the language arts program. These were reading aloud, criticizing speeches, learning elementary matters of style and keeping a language notebook of daily entries.

Furness (16) investigated the possibility of improving reading through listening comprehension and suggested four ways through which this could occur. The first was the usage of both reading and listening scores to determine students performing below capacity; that is, a high listening score should indicate higher ability. Secondly, was the meeting of individual differences by using oral methods with below average students. A third suggestion was that training in sight and listening vocabularies should go together. The final suggestion was that a low reading score might indicate compensation in a listening skill.

It was proposed that the teaching of reading and listening might be easily integrated because the many "commonalties" in the two skills. Dow (11) indicated that a

desirable transfer of training between the two processes would take place because a student's attention was directed toward desired similar ends and because of common factors in both areas. These common factors were:

a. Problem of meaning in that both skills are concerned with thought arousal. In both skills the person acts as a receiver to the stimulation of someone else's prepared symbols.

b. Motivation, concentration, and set are necessary and almost identical for both skills.

c. Organization is an aid to understanding in both skills.

d. Both skills require a purposefulness on the part of the individual.

e. Retention and recall are fundamental aspects of both skills.

f. Vocabulary is necessary to both skills.

g. Tone and intent, such as irony, innuendo, or sarcasm, lead to better understanding if properly understood.

h. Note making is an aid to memory in both skills.

In one of the few studies dealing directly with the amount of transfer between listening training and reading

training, McKee (40) investigated the effect of extensive listening training upon development of reading ability. Twelve classes of 357 intermediate-grade students were presented thirty lessons in listening instruction over a six-weeks period of time. Each lesson was approximately fifteen minutes each. Progress was measured in terms of reading achievement. It was found that training in listening had a significant effect upon the ability to read, but that it was not adequate in itself for that purpose.

Erickson (13) investigated the integration of listening and reading instruction by developing eighteen listening training exercises in which reading improvement was used. In a study of 260 college freshmen, 130 of the students were given one lecture and the eighteen listening training exercises over a twelve-week period while 130 students served as a control group. The group of students receiving the listening training exercises achieved significantly higher in both listening and reading ability. It was concluded that listening comprehension could be significantly improved when reading improvement material was used in the listening training, and that lower ability students made more progress than the higher ability students

in both areas. It was also suggested that the use of recordings might be an effective method of presenting the lessons.

In summary, the preceding review of the literature suggested the following tentative statements concerning instruction in listening and reading:

1. Although both listening and reading are receptive skills and more or less passive in nature, effective instruction will lead to their improvement.

2. Although not definitely described, there exists a relationship between listening ability and reading ability which follows these general lines:

a. Through the primary and early intermediate grades, listening comprehension is usually superior to reading comprehension.

b. Around the seventh-grade level, both listening and reading comprehension are about equal.

c. From high school on into adulthood, reading comprehension is usually superior to listening comprehension.

d. With easy material, listening comprehension is more effective, and with hard material, reading comprehension is more effective.

c. With low mental ability students, listening comprehension is superior, and with high mental ability students, reading comprehension is superior.

3. Although there are differences between the two skills of listening and reading, there are many more similarities which suggest that training in both skills should be presented together so as to be mutually reinforcing, one to the other.

Programed Learning

Programed learning has been the object of a great many studies in the last decade. Early work in this area was done by Pressey in developing and appraising a device which provided immediate automatic scoring of objective tests with concomitant self-instruction, or "as a student answered each question, that answer was immediately and automatically scored and recorded as right or wrong" (56, p. 417). The device developed had two basic purposes--to inform immediately, and to locate areas of weakness. The theoretical assumption made was that "other things being equal, the response which has been made the most often and most recently is most likely to be made again" (56, p. 418). A punchboard was developed which

fit under a student's answer sheet and let the student know the value of his answer immediately and also kept a record of the wrong responses made by the student. To evaluate this device, thirteen sections of college students enrolled in educational psychology were given posttests. Four sections used practice tests with the punchboard, two sections used the practice test alone and discussed test results with the instructor, and seven sections had only the regular lectures in the course. On posttests administered eight weeks later to all thirteen sections, it was found that the groups using the punchboard scored significantly higher than the other groups not using the punchboard. It was concluded that a systematic program of self-instruction, in which a student was informed of errors and guided in the right solution in a single simultaneous process, led to substantial gains in learning (56).

The underlying principles of programed learning which have received most of the attention in the literature were active participation, feedback, reinforcement and individual rates (14). Studies concerned with these principles were reviewed in four main areas: the response mode, eliciting the desired response, adaption to individual differences and comparisons with conventional instruction.

The response mode alternatives were generally between a constructed response and a multiple choice response and between the overt and covert responses. Skinner maintained that the constructed response was better than the multiple-choice response since the purpose of teaching was to develop recall rather than recognition. Filling in the blank required that a student read carefully the statement and "only those parts of an item which must be read to correctly complete a blank can be safely assumed to be learned" (69,p.974). Borg and Crogun investigated the effectiveness of the Skinner-type teaching machine with constructed responses. The achievement of fifty-one college students taking a course in General Psychology and using this machine compared with fifty-two students in the same class who studied the same course content in the same amount of time, not using the machine. It was found that students using the programed material made significantly greater gains. It was further concluded that "the machine partially compensates for low verbal ability and poor study habits" (3, p. 369).

In a comprehensive study, Coulson and Silberman (10) compared the results of three variables in programed material: the response mode (multiple-choice vs. constructed),

the size of step (small step vs. large step), and the type of item sequence control (branching vs. nonbranching). The subjects for the experiment were 184 junior college students enrolled in beginning psychology classes at Santa Monica City College. Eighty of these subjects formed the experimental group and were so arranged that the three variables under investigation could be presented in the eight possible combinations to eight groups of ten each. Achievement was measured over a three-week period by pretests and posttests and significant differences were found in favor of the experimental group. No differences in achievement were found among the eight experimental groups using the different variables; however, it was found that the multiple-choice response mode took significantly less time than the constructed response mode, the small item steps yielded significantly higher test scores at the expense of more training time, and the branching conditions required less training time than the nonbranching sequence. Roe (58) and Zuckerman, Marshall, and Groesberg (76) also compared the two types of response mode and found no significant differences.

Another response-mode issue which received considerable attention was the overt vs. the covert response. The

necessity of the overt response was investigated by Silverman and Alter (68). A lesson on basic electricity was presented to sixty undergraduates at New York University. Thirty members of the experimental group simply read items with answers when presented sequentially by a teaching machine while thirty members of the control group were required to make constructed responses to the same items. Both groups were tested immediately after completing the programs and no significant differences were found. Keislar (27) compared the achievement of 200 primary grade children in two schools using the overt and covert responses in a physical science program presented by a teaching machine over a three-week period. No significant differences were found between the two response modes.

Goldbeck and Campbell conducted a study on the seventh-grade level in which response mode and response difficulty were compared. Sixty-three students comprised nine groups for the experiment. The three levels of difficulty were easy, intermediate and difficult, and the three response modes were overt, covert and reading. The program consisted of thirty-five factual items on history and geography. The programs were completed by the subjects

in one day and they were tested immediately upon completion. An analysis of covariance of test scores showed an interaction between response mode and difficulty, with the overt group performing below the other groups at the easy level and above the other groups at the intermediate level. The reading group made the most efficient use of time spent (19). Other findings of no differences were reported by Shettel and Lindley (63) and Krumboltz and Weisman (32).

The second area of research with programed instruction was concerned with eliciting the response. Findings in this area were somewhat consistent when dealing with the two methods of confirmation and prompting. In confirmation the stimulus term of a pair was presented, the answers were overtly written, and then the correct response term was presented. In prompting, both the stimulus term and the response term were presented together, and the subject practiced the response term. Silberman, Melaragno and Coulson (66) conducted a study in which these two methods were compared. Forty-four junior college students were assigned to three groups; one group using the confirmation method, one group using the prompting method, and one group using the prompting method on a fixed sequence permitting

no review. A test consisting of twenty-three recall and twenty-eight multiple-choice questions was administered immediately following the learning situation. No significant differences were found; however, the prompting groups took significantly less time than the confirmation group.

Cooke and Spitzer (9) investigated the methods of prompting and confirmation by testing four response conditions in which thirty-five college males learned under each of the four conditions. Condition A was prompting with no overt practice. Condition B was confirmation with no overt practice. Condition C was prompting with overt practice. Condition D was confirmation with overt practice. In terms of the amount of learning, Condition A was best and Condition D was the poorest. It was concluded that overt practice interfered with learning the response term and with connecting it with its proper stimulus, and that prompting was superior to confirmation.

In comparing the two methods with 120 introductory psychology students, it was found that not only was prompting superior to confirmation, but that a consistently greater number of errors was produced through the confirmation method (64). Koess and Zeaman (31), Silberman (67), Cook (8) and Melaragno (43) all reported prompting superior

to confirmation. Briggs (4) and Israel (26) also reported prompting superior over confirmation, but they further discovered that as the learning progresses, smaller amounts of prompting were necessary.

A third area of research investigated the adaptation of programs to individual differences, with special emphasis given to branching, pacing and repetition. Silberman (65) conducted a study in which three groups, seventeen subjects in each group, learned identical material in different types of programs: fixed-sequence, branching, and statements arranged in paragraph form. No significant differences were found between the three methods. Using the same subjects, two other methods were compared in which a computer-controlled teaching machine presented items in a sequence determined by the errors that were made during the interaction to one group while a fixed-sequence program was presented to the other group. No significant differences in learning were found between the two types of presentation.

Rothkopf (59) compared two methods of presenting material in a self-instruction device in which the pacing was altered. In Plan I the S-R card was eliminated from the schedule as soon as it was answered correctly, allowing

for differences in speed. In Plan II, the item was kept in the sequence a desired number of correct responses, and then dropped from the schedule. One hundred airmen were divided into equal groups and pretests and posttests were given to determine learning of paired-associates between a picture of a mechanical part and a letter of the alphabet. No significant differences in learning were found between the two methods.

Skinner (69) suggested that different programs be designed to meet the different rates of fast and slow learners. However, Shay (62) reported no relationship between learning, I.Q., and stepsize and suggested one program for all levels of ability.

The fourth area of research explored the comparisons of programed materials to conventional instruction. Studies have compared machines with programed textbooks as presentation modes, and programed instruction with conventional classroom instruction. In a comparison of machine presentation with programed textbooks, sixty-three Bell Telephone technicians were equally divided into two groups to study a course in basic electricity. One group received the material by machine and the other group received the material by programed textbook. It was found that there

were no significant differences in master of the program subject matter, and that there was a time-saving feature connected with the use of programed textbooks (24). Goldstein and Gotkin (18) summarized eight studies in the literature pertaining to the effectiveness of these two modes of presentation with identical findings: there were no differences in learning found between the two presentations, and generally, there was a savings of time with the programed textbook.

Several studies were concerned with the use of programed instruction in the classroom. Smith and Quakenbush (71) studied the effects of programed instruction used to present elementary mathematics in a special education setting. During the 1959 school year, records were kept on the mathematical achievement of twenty-three special education students using programed workbooks and machines, and their progress was compared with records from a previous class the preceding year. The mathematical teaching aids were kept in the room and students were allowed to work with them when they desired, individually or in groups. There was a significant improvement of the experimental class over the control class from the previous

year. It was concluded that the programed materials were useful in promoting academic achievement and better motivation.

Porter (54) reported that simple teaching machines were used on the teaching of spelling in experimental classes on the second- and sixth-grade level. In twenty-two out of the normal thirty-four weeks of spelling instruction the machines were used by the experimental groups. On both levels, spelling achievement was significantly superior for the experimental groups over control groups. However, in testing for novelty effect, early scores and later scores were compared and no differences were found. In another study by Rothkopf (60) programed self-instructional booklets were compared with unguided study in the acquisition of equivalences. Following presentation of material by these methods, no immediate differences were found, but 120 days later, test scores indicated significant differences in retention between the methods, with the programed self-instructional booklets being superior. Other studies by Oakes (51) and Newman (47) found no significant differences in learning between programed instruction and conventional classroom

procedures, but there was a trend for the programed materials to produce better improvement.

Following a survey of eighty experiments on programed instruction concerned with response mode, eliciting response, adaptation to individual differences, and comparisons with conventional instruction, Silberman (65) observed that nonsignificant differences were the rule rather than the exception. The adequacy of testing was questioned. It was further noted that it was not uncommon to find very short programs, administered in one or two hours to small samples of highly motivated subjects viewing the program as a test, followed immediately by a hastily improvised quiz. Conflicting results were attributed to differences in study time or the relation of training task to the criterion task. Comparisons between studies were hindered because of differences in programs, samples of subjects, the criterion, and the conditions of administration.

In summary, the literature suggested the following statements concerning programed instruction:

1. Generally, the covert response mode resulted in more efficient learning than the overt response mode, although neither mode produced superior learning.

2. Generally, prompting procedures were more efficient than confirmation procedures, although neither produced superior learning.

3. It appeared to make little difference as to the branching, pacing or amount of repetition involved in the programed instruction.

4. Comparisons between programed and conventional instruction generally indicated that programs are at least as good as conventional procedures and certainly better than no instruction at all.

Language Laboratories

It was predicted in 1904 that the "phonograph would prove a valuable help in the hands of an able teacher" (30, p. 4). Phonographs with both cylinders and discs proved useful in the teaching of pronunciation at the earliest stages and remained the language teacher's most useful mechanical aid until the late 1940's. In the 1920's a few foreign language departments established "phonetics laboratories," utilizing recording and listening equipment, phonographs, dictaphones and ediphones (30). The language laboratory began a rapid development in the Army in World War II and continued to increase rapidly under the stimulus

of the National Defense Education Act of 1958 which provided matching funds, research support, teacher training and institutes. Linguistics and electronics, along with the revolutionary work of Skinner and others in programed learning, have developed into an audio-lingual approach to programed learning which has found a ready place in the instructional programs of the nation's public schools. In 1962, a survey by the United States Office of Education predicted that more than 2,500 secondary schools and more than 700 colleges and universities would have some kind of language laboratory (39). Recent interests have investigated the applications of the audio and vocal response of the language laboratory to self-instructional programs to other disciplines and skills (45).

Audio-visual aids were used quite successfully in the armed services for instructional purposes. Miles and Spain (44) reported that auditory devices, mostly wire and tape equipment, had been used successfully to teach Morse and voice code work, familiarity of equipment, air-traffic communication procedures, cockpit checkouts for pilots before and during flight, and in teaching foreign languages. In the Chinese Language School at Yale University, seventeen instructors were required to train thirty

men, and the course equipped students in four months with the equivalent of approximately four college years of a language course under normal conditions. However, in this situation a full day was spent in class and recordings could be taken home and studied at night.

The public schools were fast to bring this new method of teaching into their instructional programs. Pickrel, Neidt, and Gibson reported that tape recordings used to teach Spanish to seventh-grade students in Westside Junior-Senior High School, Omaha, Nebraska, aided the regular classroom teacher not trained to speak Spanish to "teach conversational Spanish effectively when they back their teaching on tapes prepared by a Spanish specialist" (53, p. 93). Mead likewise reported that tape recordings could be a "good substitute until specialist teachers in the elementary school level can be trained in sufficient numbers" (42, p. 147).

Larew and Lottes investigated the teaching of Spanish on the third-grade level by comparing the effects of a Spanish specialist and regular classroom teacher using tapes made by the Spanish specialist. Four classes were divided into two groups of thirty-seven each. One group

was taught Spanish exclusively by tape recordings with a regular classroom teacher, and the other group was taught Spanish by an experienced foreign language teacher. Over a five-week period identical material was presented in eleven lessons to both groups. Comparison of achievement on vocabulary and comprehension and articulation found no significant differences at the completion of the programs. It was concluded that "it appears that well prepared tapes are a good substitute in the early stages of teaching Spanish to children in the primary grades" (35, p. 202).

The effect of two methods of responding in a language laboratory, oral and non-oral, was investigated on the kindergarten level by McNeil (41). One hundred eighty-eight subjects were randomly assigned to two groups. Each subject was placed in a language-laboratory type cubicle equipped with headphones through which was heard the taped commentary. A response panel was used by the non-oral group and a microphone to give the response was used by the oral group. The task of the study was to increase reading ability through word recall, word identification and word comprehension. Differences betwee pretest and posttest scores differed significantly in favor of the

oral responding group with reference to achievement in reading ability.

Loder (38) studied aural learning with and without the speaker present using 449 pupils from seven junior high schools located in various sections of Lincoln, Nebraska. The subjects were divided into two groups; Group I received lessons over a loudspeaker with the speaker himself not visible, and Group II received lessons directly from the speaker. Four lessons on narcotics were presented to both groups. No significant difference between amounts of retention of the two groups was found on immediate testing; however, there was a trend in favor of Group I on a test given forty-four days later.

Although not a primary purpose of the language laboratory, it was discovered that student participation in these laboratories increased their ability to "aud"--described as the process of hearing, listening to, recognizing, and interpreting or comprehending spoken language (15). Heilman (22) developed and recorded six listening training records which were presented to 220 college freshmen at Michigan State University. When a comparison was made between the students using the records and 234 students having no listening training, it was concluded

that: (a) listening ability improved significantly; (b) there was a transfer of training to situations not directly connected with the actual training experience; and (c) the students with lower listening ability achieved higher than the students with higher listening ability. Dow (12) also reported using tape recordings with 4,000 students in Michigan State University in a successful listening program.

Increased importance was placed upon type of program which would be most effective on tapes. Stack (72) reviewed the construction of successful programs put on tapes and summarized important characteristics as follows:

a. A single tape should teach only a single new concept and should allow the student to drill at least twice on the concept;

b. All tapes should have a standard format, or a consistent way of introducing and concluding each tape; and

c. Each tape should have two phases--the teaching phase in which the instructional material is presented, and the testing phase in which the student finds out if the concept has been mastered.

Stack further defined three types of drills recorded on tapes which had proved vastly superior to simple repetition drills:

a. The anticipation drill.--This exercise is composed of four main parts: the student receiving the stimulus, the student reacting to the stimulus, the student hearing the correct answer for comparison, and the student repeating the correct answer.

b. The narration drill.--This exercise is used to allow the student to repeat the simple, short present-tense sentences in another tense.

c. The exploded drill.--This exercise is the recording of a foreign language by a native speaker in such a way that artificial pauses are provided for student repetition.

King (28) presented a comparative analysis of the language laboratory and the teaching machine in an effort to further realize the implications of the language laboratory impact upon teaching methods. The following factors were noted:

a. Both are self-teaching;

b. Both provide opportunity for students to progress in accordance with their own abilities and motivations;

c. In both, the student's progress depends upon the solving of problems;

d. Both utilize good programed materials;

e. Both may be used to teach different subjects;

f. The language laboratory uses audio presentation whereas the teaching machine uses visual presentation;

g. Both create motivation in students; and

h. The language laboratory may be used either individually or with a group whereas the teaching machine is used by the individual only.

Following a lengthy survey of existing taped programs and their uses (while serving as Director of the Ford Foundation Research Project on the use of tapes in the Secondary School), Gibson (17) issued the following points in their favor:

a. The teaching of larger groups;

b. The spread of "good teaching" by experts to more students;

c. Saving the teacher from the fatigue of repetition;

d. Allowing a teacher to give instruction in a specialized area;

e. The tapes and equipment are less expensive than textbooks; and

f. Individual differences are met by catering to the accelerated and giving additional drill to the slow.

In summary of the literature reviewed in this area, it appeared that the language laboratory, properly equipped and programed, could be utilized as an effective means of instruction in the public schools. The over-all implications of the review of the literature in the three areas of instruction in listening and reading, programed learning and the language laboratory suggested that there was a definite need for training in listening, that training in both listening and reading together would be mutually reinforcing, and that the language laboratory situation would readily lend itself as a method of presenting programed material in this area of instruction which would be both efficient and effective.

In the following chapter, the subjects involved in the study and the Listen and Read Program will be described, and methods and procedures employed in the collection of data for this experiment will be discussed.

CHAPTER BIBLIOGRAPHY

1. Anderson, H. A., "Needed Research in Listening," Elementary English, XXIX (April, 1952), 215-224.

2. Baker, W. D., "Listening--A Functional Part of Composition," Journal of Communication, VI (Winter, 1956), 174-179.

3. Borg, W. R. and Crogun, J. R., "The Teaching Machines as a Study Aid," Abstract, American Psychologist, XVI (July, 1960), 369.

4. Briggs, L. J., "Two Self-Instructional Devices," Psychological Reports, IV (December, 1958), 671-676.

5. Brown, J. I., "Construction of a Diagnostic Test of Listening Comprehension," Journal of Experimental Education, XVIII (December, 1949), 139-146.

6. Caffery, J., "The Establishment of Auding-Age Norms," School and Society, LXX (November, 1949), 310-312.

7. Canfield, G. R., "Approaches to Listening Improvement," Elementary English, XXXV (December, 1958), 525-528.

8. Cook, J. O., "Supplementary Report: Processes Underlying a Single Paired-Associate Item," Journal of Experimental Psychology, LVI (May, 1958), 455.

9. Cook, J. O. and Spitzer, M. E., "Supplementary Report: Prompting Versus Confirmation in Paired-Associate Learning," Journal of Experimental Psychology, LIX (April, 1960), 275-276.

10. Coulson, J. E. and Silberman, H. F., "Effects of Three Variables in a Teaching Machine," Journal of Educational Psychology, LI (June, 1960), 135-143.

11. Dow, C., "Integrating the Teaching of Reading and Listening Comprehension" Journal of Communication, VIII (Autumn, 1958), 118-126.

12. _____, "Listening Instruction at Michigan State," Journal of Communication, V (Autumn, 1955), 110-112.

13. Erickson, A., "Can Listening Efficiency Be Improved?" Journal of Communication, IV (Winter, 1954), 128-132.

14. Feldjusen, J. F., "Tapes for Teaching Machines," Phi Delta Kappan, XLIV (March, 1963), 265-267.

15. Fulton, R. J., "Language Laboratories Develop the Listening Ear," Modern Language Journal, XLIII (May, 1959), 224-225.

16. Furness, E. L., "Improving Reading Through Listening," Elementary English, XXXIV (September, 1957), 307-311.

17. Gibson, R., "Can Tapes Teach?" Educational Screen, XXXVII (April, 1958), 180-181.

18. Goldstein, L. S. and Gotkin, L. G., "A Review of Research: Teaching Machines vs. Programed Textbooks as Presentation Modes," Journal of Programed Instruction, I (1963), 29-36.

19. Goldbeck, R. A. and Campbell, V. N., "The Effects of Response Mode and Response Difficulty on Programed Learning," Journal of Educational Psychology, LIII (June, 1962), 110-118.

20. Griffin, K. and Hannah L., "A Study of the Results of an Extremely Short Instructional Unit in Listening," Journal of Communication, X (September, 1960), 135-139.

21. Hampleman, R. S., "Comparison of Listening and Reading Comprehension Ability of Fourth and Sixth Grade Pupils," Elementary English, XXXV (January, 1958), 49-53.

22. Heilman, A., "An Investigation in Measuring and Improving the Listening of College Freshman," Speech Monographs, XVIII (November, 1951), 302-308.

23. Hollow, M., "Listening Comprehension at the Intermediate Grade Level," Elementary School Journal, LVI (December, 1955), 158-161.

24. Holt, H. O. and Hammock, J., "Books as Teaching Machines: Some Data," Applied Programed Instruction, edited by S. S. Marqulies and L. D. Eigen, New York, John Wiley and Sons, Inc., 50-56.

25. Hosey, G. V., "Better Speech Through Better Listening," Journal of Business Education, XXXIV (January, 1959), 172-173.

26. Israel, M. L., "Variably Blurred Prompting: Methodology and Application to the Analysis of Paired-Associate Learning," Journal of Psychology, L (July, 1960), 43-52.

27. Keisler, E. R. and McNeil, J. D., "A Comparison of Two Responses Modes in an Auto-Instructional Program with Children in the Primary Grades," Abstract, American Psychologist, XVI (July, 1961), 369.

28. King, P. E. "Teaching Machines and the Language Laboratory," American School Board Journal, CXLI (August, 1960), 17-18.

29. King, W. H., "An Experimental Investigation into the Relative Merits of Listening and Reading Comprehension for Boys and Girls of Primary School Age," British Journal of Educational Psychology, XXIX (February, 1959), 42-49.

30. Koekkoek, B. J., "The Advent of the Language Laboratory," Modern Language Journal, XLIII (January, 1959), 4-5.

31. Koess, B. J. and Zeaman, D., "Positive and Negative Knowledge of Results on a Pressey-Type Punch-Board," Journal of Experimental Psychology, LX (July, 1960), 12-17.

32. Krumboltz, J. D. and Weisman, R. G., "The Effect of Overt vs. Covert Responding to Programed Instruction on Immediate and Delayed Retention," Journal of Educational Psychology, LIII (April, 1962), 89-92.

33. Langsam, R. S., "A Factorial Analysis of Reading Ability," Journal of Experimental Education, X (September, 1941), 57-63.

34. Language Arts for Today's Children, The Commission on the English Curriculum of the National Council of Teachers of English, New York, Appleton-Century-Crofts, Inc., 1954, 71-104.

35. Larew, L. A. and Lottes, J. J., "Tape Recorder versus the Teacher in Spanish Class," Elementary School Journal, LXII (March, 1962), 199-202.

36. Larsen, R. P. and Feder, D. D., "Common and Differential Factors in Reading and Hearing Comprehension," Journal of Experimental Education, XXXI (May, 1940), 241-252.

37. Lewis, M. S., "Teaching Children to Listen," Education, LXXX (April, 1960), 455-459.

38. Loder, J. E., "A Study of Aural Learning with and without the Speaker Present," Educational Screen, XXXVII (April, 1958), 176-177.

39. Mathieu, G., "Language Laboratories," Review of Educational Research, XXXII (April, 1962), 168-178.

40. McKee, P. G., The Teaching of Reading in the Elementary School, New York, Houghton-Mifflin, 1948.

41. McNeil, J. D., "Programed Instruction as a Research Tool in Reading: An Annotated Case," Journal of Programed Instruction, I (1963), 37-42.

42. Mead, R. S., "Stop-gap FLES?" Hispania, XLIV (March, 1961), 147.

43. Melarago, R. J., "Effects of Negative Reinforcement in an Automated Teaching Setting," Psychological Reports, VII (October, 1960), 381-384.

44. Miles, J. R. and Spain, C. R., Audio-Visual Aids in the Armed Services, Washington, D. C., American Council on Education, 1947.

45. Morton, F. R., "The Language Laboratory as a Teaching Machine," International Journal of American Linguistics, XXVI, Part 2 (October, 1960), 113-166.

46. Needham, A., "Listening Exercises with a Purpose," Education, LXXV (January, 1955), 311-315.

47. Newman, S. E., "Student vs. Instructor Design of Study Methods," Journal of Educational Psychology, XLVIII (October, 1948), 328-333.

48. Nichols, R. G., "Factors in Listening Comprehension," Speech Monographs, XV (No. 2, 1948), 154-163.

49. Nichols, R. G. and Cashman, P. H., "The Approval Factor in Listening," Education, LXXX (January, 1960), 268-271.

50. Nichols, R. G. and Stevens, L. A., Are You Listening, New York, McGraw-Hill Book Company, Inc., 1957.

51. Oakes, W. F., "Use of Teaching Machines as a Study Aid in an Introductory Psychology Course," Psychological Reports, VII (October, 1960), 297-303.

52. O'Connor, O. M., "The Art of Listening," Educational Screen and Audio-Visual Guide, XXXVIII (October, 1959), 523.

53. Pickrel, G., Neidt, C., and Gibson, R., "Tape Recordings Are Used to Teach Seventh Grade Students in West-Side Junior-Senior High School, Omaha, Nebraska," Bulletin of the National Association of Secondary School Principals, XLII (January, 1958), 81-93.

54. Porter, D., "Some Effects of Year-Long Teaching Machine Instruction," Automatic Teaching: The State of the Art, New York, John Wiley and Sons, 1959, pp. 85-90.

55. Pratt, E., "Experimental Evaluation of a Program of Improvement of Listening," Elementary School Journal, LVI (March, 1956), 315.

56. Pressey, S. L., "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Concomitant Self-Instruction," Journal of Psychology, XXIX (April, 1960), 417-447.

57. Rankin, P. T., "The Importance of Listening Ability," English Journal, XVII (October, 1928), 623-630.

58. Roe, A., "A Comparison of Programed Texts, Multiple-Choice Machines, Free-Response Machines, Programed Lectures, and Standard Lectures," Abstract, American Psychologist, XVI (July, 1961), 369.

59. Rothkopf, E. Z., "Automated Teaching Devices and a Comparison of Two Variations of the Method of Adjusted Learning," Psychological Reports, VIII (September, 1961), 163-169.

60. _____, "Programed Self-Instructional Booklets, Mnemonic Phrases, and Unguided Study in the Acquisition of Equivalences," Journal of Programed Instruction, I (1963), 19-28.

61. Russell, R. D., " Comparison of Two Methods of Learning," Journal of Educational Research, XVII (October, 1928), 235-238.

62. Shay, C. B., "Relationship of Intelligence to Step Size on a Teaching Machine Program," Journal of Educational Psychology, LII (February, 1961), 98-102.

63. Shettel, H. H. and Lindley, R. H., "An Experimental Evaluation of Two Types of Self-Instructional Programs for Teaching a Paired-Associate Task," Abstract, American Psychologist, XVI (July, 1961), 369.

64. Sidowski, J. B., Kopstein, F. F., and Shillestead, I. J., "Prompting and Confirmation Variables in Verbal Learning," Psychological Reports, VIII (June, 1961), 369.

65. Silberman, H. F., "Characteristics of Some Recent Studies of Instructional Methods," Programmed Learning and Computer-Based Instruction, edited by J. Coulson, New York, John Wiley and Sons, Inc., 17, 18.

66. Silberman, H. F., Melaragno, R. J., and Coulson, J., "Confirmation and Prompting with Connected Discourse Material," Psychological Reports, IX (October, 1961), 235-238.

67. Silberman, H. F. and others, "Fixed Sequence vs. Branching Auto-Instructional Methods," Journal of Educational Psychology, LII (June, 1961), 166-172.

68. Silverman, R. E. and Alter, M., "Note on the Response in Teaching Machine Programs," Psychological Reports, VII (December, 1960), 496.

69. Skinner, B. F., "Teaching Machines," Science, CXXVIII (October, 1958), 969-977.

70. Smith, D. V., "Learning to Listen, Listening to Learn in the Elementary School," National Education Association Journal, XLVII (February, 1958), 100-101.

71. Smith, E. A. and Quackenbush, J., "Devereux Teaching Aids Employed in Presenting Elementary Mathematics in a Special Education Setting," Psychological Reports, VII (October, 1960), 272-280.

72. Stack, E. M., "Patterned Drills for the Language Laboratory," French Review, XXXIII (January, 1960), 272-280.

73. Taylor, S. E., EDL Listen and Read Program, New York, Educational Developmental Laboratories, 1962.

74. Wagner, G. W., "What Schools Are Doing in Developing Listening Power," Education, LXXVIII (December, 1957), 325-333.

75. Wepman, J. M., "Auditory Discrimination, Speech and Reading," Elementary School Journal, LX (May, 1959), 325-333.

76. Zuckerman, C. B., Marshall, G. R., and Croesberg, S., "Research in the Automation of Teaching," NAVTRADEVCEN, Port Washington, New York, U.S. Naval Training Device Center (February, 1961), 666-671.

CHAPTER III

SUBJECTS, MATERIALS AND PROCEDURES

Subjects

The 157 subjects involved in this study were enrolled in six regularly scheduled eighth-grade English classes in a suburban community located in North Central Texas. The city has a population of approximately 40,000. Many successful businesses and industries provide a sound financial support for community projects and the public schools. Most of the people living in the community are employed in the local industries, with some commuting to a neighboring city for employment in the industrial complex there.

The public school system is composed of three high schools, four junior high schools, and eleven elementary schools. This particular study was conducted in one of the junior high schools. Students enrolled in this junior high school were of urban backgrounds and representative of the middle socio-economic class. During the 1962-1963 school year in which this study was conducted, the total enrollment for the school was 272 students in the seventh grade, 265 students in the eighth grade, and 225 students

in the ninth grade. Strict homogeneous grouping has not been practiced in the school; however, for several years on each grade level, the lower 10 per cent of the students received special remedial instruction, and the upper 10 per cent of the students received special enrichment instruction. These percentages were approximations and varied slightly from year to year based on teacher recommendations and test performance. Subjects for this experiment were from the remaining 80 per cent of the students.

Of the 157 original subjects, 128 participated in the experiment. Eight subjects who moved away during the school year, seventeen who were absent during the testing periods and one boy, a spastic confined to a wheel chair, were all eliminated from the study. At the end of the school year, complete records were obtained on 67 subjects in the experimental group and 64 subjects in the control group. Since the statistical treatment required equal numbers of subjects in both groups, three subjects from the experimental group were eliminated by using a table of random numbers (1, pp. 262-264), leaving 64 subjects in each group. In the experimental group, there were 30 males and 34 females with an average age of 13.13 years, and in the control group there were 32 males and 32 females

with an average age of 13.33 years. In a six-period daily schedule, the three experimental classes reported to English during periods 2, 5, and 6, and the three classes in the control group met English during periods 4, 5, and 6.

Table I presents the means of intelligence and achievement of the two principal groups, as measured by the pretest battery administered at the beginning of the school year. Although the means of both intelligence and

TABLE I

A COMPARISON OF INTELLIGENCE AND ACHIEVEMENT MEANS OF THE TWO PRINCIPAL GROUPS

Group	Intelligence	Study Skills	Reading	Listening	Language
Experimental	55.83	57.67	99.64	45.03	76.05
Control	57.67	61.19	101.95	45.88	78.35

achievement for the control group are somewhat higher than the experimental group, a t test revealed no significant differences between the two groups for any of the areas.

Materials

The Listen and Read Program was developed as a consequence of research findings in three areas: instruction

in listening and reading, programed learning, and the language laboratory. This program consisted of three main elements: (1) thirty tapes, (2) student workbooks, and (3) equipment for presentation.

The tapes in the series covered topics usually considered in developmental reading programs on the secondary level. Tapes I and 2 stressed the interrelationships of listening, reading and language. Tapes 3 through 10 provided exercises designed to increase understanding of words, sentences and paragraphs, and their use in expressing ideas. Tapes 11 through 19 dealt with the study skills, and the last group of tapes encouraged critical listening and reading and the enjoyment of many forms of literature (3). The tape titles were as follows:

1. How Well Do You Listen?
2. Listening and Reading
3. Words and Your Senses
4. Meeting New Words
5. Unlocking Sentence Meaning
6. Sentences - From Simple to Complex
7. Using Signs and Signals in Reading
8. Spotting Topics in Paragraphs
9. Paragraph Keys

10. Following the Author's Organization

11. Check Your Study Habits

12. How to Study with SQ3R

13. Underlining with a Purpose

14. The Art of Note Making

15. Outlining - Finding the Skeleton in Listening and Reading

16. The Language of Charts, Graphs, Maps, and Diagrams

17. Compressing Ideas by Abbreviating and Summarizing

18. Shifting Gears in Reading

19. Skimming and Scanning

20. The Reading Habit

21. Reading Between the Lines

22. The Power of Persuasion

23. News of the Day

24. Figurative Language

25. Finding Viewpoints in Essays

26. The Magic of Storytelling

27. Looking into the Lives of Others - The Novel

28. Biography - The Story of People

29. The Play's the Thing

30. The Sound of Poetry

This multilevel approach to instruction in both listening and reading was designed for use with students on all levels from junior high school through early college, and was based on the following premises (3):

1. Students in need of reading improvement can hear and comprehend through conversation patterns far more than they can read and comprehend; thus reading instruction given orally will be better understood and applied.

2. Reading and listening are both parts of the communication process, and it is advantageous to develop them simultaneously so that they can reinforce each other.

3. The combined use of tape and workbook permits immediate reinforcement at each step of the learning process.

4. Listening instruction with headphones will produce an unparalleled attention level, shutting off distractions from the student.

5. Improvement in vocabulary, comprehension, and organization as a result of the listening experience will transfer directly to the reading process.

The student workbook contained exercises and response pages for each tape, comprehension checks, correlated reading material, and comprehension charts. One of these expendable workbooks was required for each student.

The equipment for presentation consisted of thirty headsets, a tape recorder, and four jack boxes. The tape recorder was used with a playback speed of 7½ inches per second, and a push button stop-start playback to stop the recorder while students worked exercises in the workbooks at the proper time. Following the completion of the exercises, the tape recorder was restarted to give answers to the exercise just completed and to proceed with more instruction. From the output jack in the tape recorder, four jack boxes, each one capable of connecting eight sets of headphones, was connected in a series. These jack boxes were used to extend headphones to four library tables at which students could individually listen to a tape and work the corresponding exercise in the workbook. This arrangement was installed in a classroom for one year and used as a "listening laboratory."

Procedure for Collecting Data

Since the Listen and Read Program had never been used before in a research project, a pilot study was conducted during the fall semester of the 1961-1962 school year in the same school in which later study took place. Ten of the series of thirty tapes were played to an

experimental group while ten corresponding teacher lessons were presented to a control group. Both classes were under the direction of a teacher to be used in the later study. Following an eight-week period, differences in gains of achievement between the groups were significantly higher for the experimental group. The pilot study served the following purposes:

1. To ascertain the feasibility of the Listen and Read Program when integrated into an eighth-grade language arts program;

2. To familiarize the participating teacher with preparing and delivering lessons identical in concepts and time to exercises on the tapes;

3. To orient the participating teacher with the Listen and Read Program and its use; and

4. To determine direction for the hypothesis of the later study.

During the spring of 1962, arrangements were made with the principal of the public junior high school to schedule regular English classes so that one teacher would have four classes and the other teacher would have two classes, all eligible to participate in the study. Of

the four classes being instructed by one teacher, two were selected for part of the experimental group using a table of random numbers, and the remaining two classes were assigned to the control group. Of the two classes being instructed by the other teacher, one was selected for the other part of the experimental group using a table of random numbers, and the remaining class was assigned to the control group. The teacher instructing four classes had a Bachelor of Arts degree in English and fourteen years of teaching experience. The teacher instructing two classes had a Bachelor of Arts degree and a Master of Education degree and fifteen years of teaching experience. Both teachers were recommended by the principal as being capable and competent. The data were collected in the following manner:

1. During October, 1962, the Brown-Carlsen Listening Comprehension Test, Form Am, the California Achievement Test, Reading Section and Language Section, Form X, 1957 Edition, the Contemporary Test of Scholastic Progress, Texas Series, Test 5, Study Skills, and the California Test of Mental Maturity, Form-S, 1957 Edition were administered to the two principal groups to obtain pretest scores. These tests were administered in a classroom

group situation during the regular class period by the classroom teacher over a two-week period of time. Answers for each test were marked on separate answer sheets and scored on an IBM Test Scoring Machine.

2. From October, 1962, until May, 1963, the first twenty-five tapes of the Listen and Read Program were heard by the experimental group in the "listening laboratory." After tapes 1 and 2 had been played, no set sequence was followed. Tapes were used whenever the regular classroom instruction was related to a particular tape topic. The listening and working time for each tape was approximately thirty minutes.

3. From October, 1962, until May, 1963, twenty-five teacher lessons including the same basic concepts in listening, reading, study skill and language development as those found in the first twenty-five tapes of the Listen and Read Program, were prepared and delivered by the teachers to the control group. The listening and working time for each teacher lesson was approximately thirty minutes. The source of the exact content for each teacher is listed in the Appendix.

4. During May, 1963, the Brown-Carlsen Listening Comprehension Test, Form Bm, the California Achievement

Test, Reading Section and Language Section, Form Y, 1957 Edition and the Contemporary Test of Scholastic Progress, Texas Series, Test 5, Study Skills, were administered to the two principal groups to obtain posttest scores. All tests were administered simultaneously to both groups in the school cafeteria during one day. Answers for each test were marked on separate answer sheets and scored on an IBM Test Scoring Machine.

5. Pretest scores were subtracted from posttest scores on the eighteen criteria presented in the tests to determine achievement in listening, reading, study skills and English.

Procedure for Treating Data

The procedure for treating data was the complex analysis of variance described by McNemar (2, p. 296) as "double classification with more than one score per cell," and followed these steps:

1. Subjects in both groups were ranked from high to low according to their total score on the California Test of Mental Maturity.

2. The middle twelve scores, approximately 20 per cent of each distribution, were removed to avoid contamination

in the classifying of students as either high ability or low ability.

3. A two-by-two table for each of the eighteen variables was prepared in which the experimental and control groups were represented in the columns, and the high ability and low ability students were represented in the rows.

4. In each of the two-by-two tables, the sums of scores, sums of scores squared, and means for each cell was computed.

5. The sums of scores, sums of scores squared, and means for the two columns and two rows were computed and totaled.

6. Using formulas suggested by McNemar (2, p. 298) the variance estimate for rows, columns, interaction, and within cells was computed.

7. The F values for row effect, column effect, and interaction were computed to determine the level of significance.

The tenability of the hypotheses of the study were tested in the following manner:

1. Listening achievement data were treated in the above manner to test Hypothesis I and Hypothesis II.

2. Reading achievement data were treated in the above manner to test Hypothesis III and Hypothesis IV.

3. Study Skill achievement data were treated in the above manner to test Hypothesis V and Hypothesis VI.

4. English achievement data were treated in the above manner to test Hypothesis VII and Hypothesis VIII.

CHAPTER BIBLIOGRAPHY

1. Lindquist, E. F., Statistical Analysis in Educational Research, New York, Houghton Mifflin Co., 1940.

2. McNemar, Q., Psychological Statistics, New York, John Wiley and Sons, 1959.

3. Taylor, S. E., "Listen and Read Program," Programs, Materials, and Services, New York, Educational Developmental Laboratories, 1962.

CHAPTER IV

PRESENTATION OF RESULTS

Results of the investigation will be presented according to achievement gains in listening, reading, study skills and English, for high and low ability students in the experimental and control groups. Both subtests and total tests were analyzed, with the tenability of the hypotheses being determined by the total test analysis. The order of presentation will be the same as in the statements of the hypotheses.

Results

It was stated in Hypothesis I that there would be a significant difference between means of listening achievement gain of the two principal groups with the experimental group tending to achieve more than the control group. The treatment of the five listening subtests and total listening gains by a complex analysis of variance is presented in Table II. Since an F ratio of 3.94 was required for significance at the .05 level and an F ratio of 6.90 was required for significance at the .01 level, the two

TABLE II

EFFECT OF GROUPS, ABILITY, AND THE INTERACTION OF THE TWO ON LISTENING ACHIEVEMENT

Achievement	Source	Sum of Scores	df	F
Immediate Recall	Groups	13.16	1	1.56
	Ability	27.00	1	3.19
	Interaction	10.47	1	1.24
	Individual differences	846.35	100	
Total		896.98		
Following Directions	Groups	120.62	1	8.42**
	Ability	4.65	1	.32
	Interaction	44.46	1	3.10
	Individual Differences	1433.31	100	
Total		1603.04		
Recognizing Transitions	Groups	26.00	1	8.22**
	Ability	1.36	1	.44
	Interaction	3.12	1	.98
	Individual differences	316.38	100	
Total		346.88		
Word Meanings	Groups	.24	1	.06
	Ability	7.01	1	1.81
	Interaction	.01	1	.002
	Individual differences	368.65	100	
Total		393.91		
Lecture Comprehension	Groups	.09	1	.008
	Ability	33.47	1	3.30
	Interaction	.24	1	.02
	Individual differences	1014.73	100	
Total		1048.53		
Total Listening	Groups	343.47	1	5.75*
	Ability	336.24	1	5.63*
	Interaction	180.47	1	3.02
	Individual differences	5970.58	100	
Total		6830.76		

*Significant at better than the .05 level.
**Significant at better than the .01 level.

subtests, Following Directions and Recognizing Transitions, were found to be significant at better than the .01 level in favor of the experimental group. A variance between means of achievement for the total listening was found at greater than the .05 level of significance, in favor of the experimental group. Hypothesis I was accepted.

In testing Hypothesis II, that there would be a significant difference between the means of listening achievement gain of high ability and low ability students with low ability students tending to achieve more than high ability students, no significant variance for any of the subtests was found. However, all gains were in favor of the low ability students to such an extent that the F ratio of 5.63 for total listening was significant at better than the .05 level, allowing the acceptance of Hypothesis II.

The tenability of Hypothesis III was determined by the treatment of data in Table III. The hypothesis stated that there would be a significant difference between means of reading achievement gain of the two principal groups with the experimental group tending to achieve more than the control group. On the four subtests, no significant differences were found in achievement gains on Vocabulary,

TABLE III

EFFECT OF GROUPS, ABILITY, AND THE INTERACTION OF THE TWO ON READING ACHIEVEMENT

Achievement	Source	Sum of Scores	df	F
Vocabulary	Groups	44.46	1	.88
	Ability	960.15	1	19.88***
	Interaction	. .	1	. .
	Individual differences	5041.54	100	
Total		6046.15		
Following Directions	Groups	48.47	1	8.39**
	Ability	4.47	1	.60
	Interaction	5.09	1	.88
	Individual differences	577.73	100	
Total		634.76		
Reference Skills	Groups	34.62	1	3.17
	Ability	15.38	1	1.41
	Interaction	3.12	1	.29
	Individual differences	1089.77	100	
Total		1142.89		
Interpre-tation	Groups	79.63	1	2.48
	Ability	27.01	1	.84
	Interaction	25.01	1	.78
	Individual differences	3216.19	100	
Total		3347.84		
Total Reading	Groups	819.85	1	6.75*
	Ability	1477.54	1	12.17***
	Interaction	1.38	1	.01
	Individual differences	12141.08	100	
Total		14439.85		

*Significant at better than the .05 level.

**Significant at better than the .01 level.

***Significant at better than the .001 level.

Reference Skills or Interpretation. The F ratio of 8.39 on the subtest, Following Directions, indicated a variance of achievement gains at greater than the .01 level of significance. The difference between means of achievement for Total Reading was significant at better than the .05 level, supporting Hypothesis III.

It was predicted in Hypothesis IV that there would be a significant difference between means of reading achievement gain of high ability and low ability students with low ability students tending to achieve more. An examination of Table III revealed that the achievement gains of the low ability students were significantly more than those of high ability students on the subtest, Vocabulary and Total Reading. F ratios of 19.88 and 12.17, respectively, were significant at better than the .001 level. Since these differences favored the low ability students, Hypothesis IV was accepted.

The study skills data used to determine the validity of Hypothesis V and Hypothesis VI are found in Table IV. An inspection of the table revealed only a significant variance between achievement gains for the subtest, Graphic, in favor of the experimental group over the control group.

TABLE IV

EFFECT OF GROUPS, ABILITY, AND THE INTERACTION OF THE TWO ON STUDY SKILL ACHIEVEMENT

Achievement	Source	Sum of Scores	df	F
Verbal	Groups	.04	1	.001
	Ability	.35	1	.01
	Interaction	8.65	1	.29
	Individual differences	2950.92	100	
Total		2959.96		
Graphic	Groups	347.12	1	6.03*
	Ability	52.65	1	.92
	Interaction	.96	1	.02
	Individual differences	5752.77	100	
Total		6153.50		
Total Study Skills	Groups	354.46	1	3.42
	Ability	61.54	1	.59
	Interaction	15.38	1	.15
	Individual differences	10365.08	100	
Total		10796.46		

*Significant at better than the .05 level.

Other F ratios for the Verbal subtest and Total Study Skills failed to reach significance. Both hypotheses, in which was predicted a difference between means of study skill achievement gain for the two principal groups and the high and low ability students, respectively, were rejected.

It was stated in Hypothesis VII that there would be a significant difference between means of English achievement gain of the two principal groups with the experimental group tending to achieve more than the control group. The treatment of English data is represented in Table V. An examination of this table disclosed that variances between means of achievement gains for the two subtests, Punctuation and Word Usage, failed to reach significance. On the remaining subtests, Capitalization, differences in achievement gains were established at better than the .05 level of significance favoring the experimental group. A significant difference in Total English achievement in favor of the experimental group allowed the acceptance of Hypothesis VII.

In appraising the accuracy of Hypothesis VIII, that there would be a significant difference between the means of English achievement gain of high ability and low ability students with the low ability students tending to achieve more than high ability students, no significant variances were found on the subtests, Punctuation and Word Usage, as shown in Table V on the following page. In the remaining subtest, Capitalization, significant achievement

TABLE V

EFFECT OF GROUPS, ABILITY, AND THE INTERACTION OF THE TWO ON ENGLISH ACHIEVEMENT

Achievement	Source	Sum of Scores	df	F
Capitalization	Groups	108.04	1	6.75*
	Ability	77.88	1	4.87*
	Interaction	24.04	1	1.50
	Individual differences	1600.15	100	
Total		1810.12		
Punctuation	Groups	7.54	1	.55
	Ability	4.65	1	.34
	Interaction	18.62	1	1.36
	Individual differences	1366.54	100	
Total		1397.35		
Word Usage	Groups	44.46	1	2.42
	Ability	71.12	1	3.87
	Interaction	13.88	1	.75
	Individual differences	1839.92	100	
Total		1969.38		
Total English	Groups	392.35	1	6.64*
	Ability	228.04	1	3.86
	Interaction	9.85	1	.17
	Individual differences	5912.23	100	
Total		6542.47		

*Significant at better than the .05 level.

gains for the low ability students were indicated. On the Total English achievement gains, differences failed to reach significance and required the rejection of Hypothesis VIII.

In summary, the results indicated that the experimental group showed a statistically significant gain for eight of the eighteen variables, with no significant differences favoring the control group. In listening, significant variances were found in Following Directions, Recognizing Transitions, and Total Listening. In reading, significant variances were found in Following Directions and Total Reading. In study skills, a significant variance was found in Graphic Interpretation. In English, significant variances were found in Capitalization and Total English. These findings led to the acceptance of hypotheses one, three and seven and the rejection of hypothesis five.

The results with respect to high and low ability students revealed that significant achievement gains favored the low ability students on four of the eighteen variables. No significant achievement for the high ability students was found. Significant differences of achievement gains in favor of the low ability student were found

on Total Listening for listening, Vocabulary and Total Reading for reading, and Capitalization for English. This evidence led to the acceptance of hypotheses two and four and the conclusion that there were significant differences between the means of listening and reading achievement gains of high ability students and low ability students with the low ability students tending to achieve more. Hypothesis six and eight were rejected in view of the fact that there were no significant differences between means of study skill and English achievement gains of high ability and low ability students.

Discussion of Results

Since this study employed the experimental-control group type of research design, the influence of what has been called the "Hawthorne Effect" was of importance. This was explained by Cook as follows:

> The Hawthorne effect is a phenomenon characterized by an awareness on the part of the subjects of special treatment created by artificial experimental conditions. This awareness becomes confounded with the independent variable under study, with a subsequent facilitating effect on the dependent variable, thus leading to ambiguous results (1, p. 118).

Two solutions have been proposed to control this effect. One solution was to abandon the experimental-control

group type of research design in favor of continuous observations or a single group comparison. The other solution was to minimize or control as many of the external variables as possible by either hiding the fact that an experiment is taking place or to let it be known and pay equal attention to both groups (1).

The substitution of research designs in the first solution have merely produced new sources for the same effect. A more effective solution appeared to be with the second suggestion. This study employed a combination of the two approaches in the second solution. None of the subjects were told that an experiment was taking place. Classes, not individuals, were assigned to one of the groups without their knowledge. The "listening lab" was not new to the subjects since it had been used by other eighth-grade students the previous year in the pilot study. As much as possible, all things were made equal for both groups, except for the two methods of instruction. Teacher lessons were presented to control classes as special training designed to increase their listening and reading ability. Tapes in the Listen and Read Program were presented to the experimental classes as special training designed to increase their listening

and reading ability. This presentation of something "special" to both groups was in keeping with the policy set forth by the Research Council (1, p. 122) in attempting to control the Hawthorne effect. Consequently, the discussion of results is based on the assumption that differences in achievement gains were influenced very little by the Hawthorne effect.

As previously stated in assumption one, the teacher effect upon students' achievement between the two principal groups was equated by the use of two teachers with the same number of students in both groups. Therefore, any teaching qualities which affected achievement for one group also had the same opportunity to affect achievement in the other group. Although there was no apparent teacher bias for or against the Listen and Read Program, the use of two teachers tended to check the attitude of either teacher toward the taped exercises. It seemed reasonable to assume that differences in achievement gains were not the result of teacher effect.

The differences in achievement between the experimental and control groups appeared to be explained by the different methods of instruction. It was apparent that the methods and procedures of the Listen and Read Program

were more effective in some areas than the teacher lessons and about equal in other areas.

Various studies in the literature reported the effectiveness of the classroom teacher in presenting listening instruction in various areas. Nichols (18), Baker (2), Wagner (25) and Pratt (20) found evidence to support this ability of the classroom teacher. The listening data indicated that for the specific skills of word meaning, lecture comprehension and immediate recall, there were no differences in results between tape presentations and teacher lessons. The tape material on word meanings was very basic, and information concerning prefixes, suffixes and root words was presented just as effectively in the classroom situation. Similar achievement in lecture comprehension for both groups may be explained by the similar conditions for teacher lectures. Although the taped exercises concerned information helpful in lecture comprehension, the actual experience and practice in the classroom appeared to be as effective. Immediate recall or memory as measured by the test appeared to be more a function of ability than of learning. As suggested in the literature, this variable was not easily influenced by differing methods of instruction.

Significant gains in recognizing transitions pointed to the ability of the Listen and Read Program to present an illusive concept clearly, and then provide exercises to reinforce the learning process. In the literature, Oakes (19), Newman (17) and Pressey (21) had found that programed material was a more effective method than regular teacher lectures for instruction with certain variables. Classroom instruction to control students was adequate, but the situation did not lend itself readily to an instructional process with immediate feedback. The step-by-step instruction of the taped exercises appeared to be an effective means through which to teach this skill.

In the specific skill of following directions, significant gains by the experimental group appeared to be the direct result of the two different methods of instruction. Control students received instruction in following directions, but this was limited. As Anderson (1) had pointed out, the teacher admonitions to "pay attention" or "follow closely" were the only reinforcements available in a classroom situation. Also in the classroom situation, students could ask for directions later or look to a neighboring student for directions. The experimental students using the taped exercises had to listen carefully and read

carefully to keep up in the exercises and know what was expected of them next. There was practically no opportunity to check with a neighbor or teacher. The combined use of the workbook exercises and tapes apparently motivated students to receive and follow instructions individually and correctly. The successful understanding and following of directions was constantly reinforced by the student's progress through the program.

Total gains in listening achievement favored experimental students. Previous studies suggested these gains were the result of participation in the "listening lab." Taylor (24) had predicted that the use of headphones would produce a high attention level which would be more effective for following directions. Heilman (13) and Dow (7) reported the successful use of tape recordings with college students in developing listening ability. Fulton (9) found that students participating in language laboratories in the learning of foreign languages also increased in ability to hear, listen, recognize, interpret and comprehend the spoken language. In this listening situation, actual practice in listening and the development of the listening skill in a simplified, but demanding situation, appeared

to develop the listening ear more effectively than did listening instruction presented in the classroom.

The reading data revealed that the Listen and Read Program was a more effective means of instruction than teacher lessons in the skills of following directions and total reading development. Reasons for significant differences between the two groups in following directions were discussed under listening data. Significant achievement by experimental students on this skill in both listening and reading testified strongly to the effectiveness of the taped exercises in developing a student's ability to follow directions. Significant achievement in total reading development was consistent with previous studies by McKee (16) and Erickson (8) which found that listening training, utilizing reading material, was effective for improvement in both areas. Studies by Caffrey (4) and Hampleman (12) pointed out differences and likenesses between the two skills. Because of the many commonalties in both listening and reading, several writers--Anderson (1), Baker (2), Furness (10) and Dow (6)--had suggested that listening and reading instruction presented together would be mutually reinforcing one to the other. Control students in the classroom received

the same concepts, but this presentation did not have the multilevel qualities as the taped exercises.

Nonsignificant differences of achievement between the two groups on the subtests vocabulary, reference skills and interpretation indicated that these specific skills were presented as effectively by the classroom teacher as the taped exercises. These skills were easy to define and include in prepared exercises for the classroom. The actual experience in these skills through classroom exercises appeared to be sufficient for their development.

The study skills data indicated only one area of superior instruction for the Listen and Read Program, the reading of graphic materials. Control students received instruction in this skill, but the concepts and variations involved in reading graphic materials were difficult to present meaningfully in a classroom situation. It was difficult for the teachers to ascertain the degree to which each individual student comprehended a concept. The students using the Listen and Read Program interpreted various kinds of graphic materials with explanations in how to read the material, immediate feedback as to the

worth of their efforts, and more exercises to reinforce the learning. Stack (23) had reported that successful instruction on tapes included a teaching phase which presented instruction, and a testing phase which let the student find out if the concept had been mastered. Instruction for this particular skill seemed especially suited for taped exercises with maps, charts, graphs and diagrams designed to develop basic concepts.

There was apparently no difference in the effectiveness of methods for verbal and total study skill achievement. However, it appeared that significant achievement in following directions and ability in listening and reading tended to produce more achievement for the experimental students on the total study skill achievement, though not significantly.

In the literature, Dow (6) and Baker (2) had proposed the integration of instruction for specific skills so that transfer of training might take place throughout the English program. The English data suggested that achievement in listening and reading by experimental students transferred directly into significant achievement in English development and contributed to an increase in the understanding of the basic skills in English, especially

capitalization. The high level of attention and immediate feedback provided by the tapes and exercises in sentence construction, outlining, signs in reading, note making, summarizing and organization seemed to be superior to the classroom lessons received by the control group. However, classroom lessons and exercises appeared to be as effective as the taped exercises for development in punctuation and word usage. The explanation seemed to be that since regular classroom instruction covered quite extensively both skills in both groups, the extra time provided by the taped exercises and teacher lessons failed to produce significant difference in gains.

In comparing significant achievement gains of high ability and low ability students, it was found that low ability students achieved more in listening and reading but there was no significant difference of achievement between the two groups in study skills and English achievement. Neither the taped exercises nor the teacher lessons dealt directly with skills in the two latter areas. Since both groups of students received the same instruction in the regular language arts program, it appeared that taped exercises and teacher lessons were similar in effect in these areas.

The low ability students tended to achieve significantly more in total listening and reading achievement gains. Although the gains in the subtests of these two tests were more for the low-ability students, the only significant achievement was in vocabulary in the reading test. It appeared that instruction in recognizing word meanings, contextual clues and the use of words in general were basic concepts needed especially by the low-ability students, and that taped exercises offered a more effective means of presenting this information than the teacher lessons. Whereas the low-ability student could be passed over easily in the usual classroom situation, the taped exercises give ample time and opportunity to develop this skill.

The significant achievement gains in listening and reading by the low-ability students were in keeping with a majority of the findings in the literature. Although Russell (22) found that listening and reading ability were about equal at the eighth-grade level, Hampleman (12) reported that at this level listening was more effective than reading in comprehending easy material. Larsen and Feder (15) and Furness (10) discovered that students with low ability and low scholastic aptitude comprehended more

from aural instruction. After a study of the effects of using reading material in a listening training program with college freshmen, Erickson (8) concluded that low-ability students achieved significantly more in both listening and reading development. Borg and Crogun (3) found that programed learning compensated for low verbal ability and poor study habits. Gibson (11) reported that a strong point in favor of taped instruction in the secondary school was that it gave additional drill to the slow. King (14) reported similarly that taped instruction provided opportunity for students to progress in accordance with their own abilities and motivations.

In this particular experiment, the significant gains by the low-ability students seemed to be explained in part by the material included in the program itself. The materials and concepts were very basic, applying more directly to the needs of the low-ability students. Although these basic concepts served as good review for the high-ability students, they offered very little above the primary acquisition of the skill. Another explanation for differences in achievement was multilevel presentation of materials by the taped exercises. Whereas the high-ability student was more likely to be developed equally in both listening

and reading, the low-ability student was likely to be low in one ability or the other. In the multilevel presentation, a student low in one ability but higher in the other ability could use the better developed ability to gain information and practice for use in developing the other ability.

In this particular study, the use of the Listen and Read Program by the entire class favored the low-ability student. The length of pauses to complete exercises and the rate of proceeding into the program depended upon the slowest student. Consequently, the high-ability student spent some time waiting for the low-ability student. In a regular classroom situation, instruction proceeding at an average rate will many times rush the low-ability student or miss him completely. The step-by-step instruction through crucial phases of learning at the rate required by the low-ability student seemed to be a factor in their significant achievement gains.

In appraising the effectiveness of the Listen and Read Program between the two principal groups and between high- and low-ability students with respect to learning theory, significant achievement was measured and compared in terms of the acquisition of skills, and not with respect

to the development of cognitive processes. Consequently, the results of this study were not applicable to learning which involves the use of the higher cognitive processes, but the data did suggest an effective means for instruction in basic skills, especially with low-ability students.

CHAPTER BIBLIOGRAPHY

1. Anderson, H. A., "Needed Research in Listening," Elementary English, XXIX (April, 1952), 215-224.

2. Baker, W. D., "Listening--A Functional Part of Composition," Journal of Communication, VI (Winter, 1956), 174-179.

3. Borg, W. R. and Crogun, J. R., "The Teaching Machines as a Study Aid," American Psychologist, XVI (July, 1960), 369.

4. Caffery, J., "The Establishment of Auding-Age Norms," School and Society, LXX (November, 1949), 310-312.

5. Cook, D. L., "The Hawthorne Effect in Educational Research," Phi Delta Kappan, XLIV (December, 1962), 116-122.

6. Dow, C., "Integrating the Teaching of Reading and Listening Comprehension," Journal of Communication, VIII (Autumn, 1958), 118-125.

7. _____, "Listening Instruction at Michigan State," Journal of Communication, V (Autumn, 1955), 110-112.

8. Erickson, A., "Can Listening Efficiency Be Improved?" Journal of Communication, IV (Winter, 1954), 128-132.

9. Fulton, R. J., "Language Laboratories Develop the Listening Ear," Modern Language Journal, XLIII (May, 1959), 224-225.

10. Furness, E. L., "Improving Reading Through Listening," Elementary English, XXXIV (September, 1957), 307-311.

11. Gibson, R., "Can Tapes Teach?" Educational Screen, XXXVII (April, 1958), 180-181.

12. Hampleman, R. S., "Comparison of Listening and Reading Comprehension Ability of Fourth and Sixth Grade Pupils," Elementary English, XXXV (January, 1958), 49-53.

13. Heilman, A., "An Investigation in Measuring and Improving the Listening of College Freshmen," Speech Monographs, XVIII (November, 1951), 302-308.

14. King, P. E., "Teaching Machines and the Language Laboratory," American School Board Journal, CXLI (August, 1960), 170-180.

15. Larsen, R. P. and Feder, D. D., "Common and Differential Factors in Reading and Hearing Comprehension," Journal of Experimental Education XXXI (May, 1940), 241-252.

16. McKee, P. G., The Teaching of Reading in the Elementary School, New York, Houghton Mifflin Company, Inc., 1958.

17. Newman, S. E., "Student vs. Instructor Design of Study Methods," Journal of Educational Psychology, XLVIII (October, 1948), 328-333.

18. Nichols, R. G., "Factors in Listening Comprehension," Speech Monographs, XV (No. 2, 1958), 154-163.

19. Oakes, W. F., "Use of Teaching Machines as a Study Aid in an Introductory Psychology Course," Psychological Reports, VII (October, 1960), 297-303.

20. Pratt, E., "Experimental Evaluation of a Program of Improvement of Listening," Elementary School Journal, LVI (March, 1956), 315.

21. Pressey, S. L., "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Concomitant Self-Instruction," Journal of Psychology, XXIX (April, 1960), 417-447.

22. Russell, R. D., "A Comparison of Two Methods of Learning," Journal of Educational Research, XVII (October, 1928), 235-238.

23. Stack, E. M., "Patterned Drills for the Language Laboratory," French Review, XXXIII (January, 1960), 272-280.

24. Taylor, S. E., EDL Listen and Read Program, New York, Educational Developmental Laboratories, 1962.

25. Wagner, G. W., "What Schools Are Doing in Developing Listening Power," Education, LXXVIII (December, 1957), 325-333.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to compare the effectiveness of two methods of listening and reading instruction in an eighth-grade language arts program. Achievement gains in listening, reading, study skills and English were compared between low and high ability students in an experimental group receiving instruction by the Listen and Read Program and low- and high-ability students in a control group receiving instruction from lessons presented by the classroom teacher.

The hypotheses tested by this study were:

1. There will be a significant difference between means of listening achievement gain of the two principal groups with the experimental group tending to achieve more.

2. There will be a significant difference between the means of listening achievement of high- and low-ability students with the low-ability students tending to achieve more.

3. There will be a significant difference between means of reading achievement of the two principal groups with the experimental group tending to achieve more.

4. There will be a significant difference between means of reading achievement gain of high and low ability students with the low ability students tending to achieve more.

5. There will be a significant difference between means of study skill achievement gain of the two principal groups with the experimental group tending to achieve more.

6. There will be a significant difference between means of study skill achievement gain of high ability and low ability students with low ability students tending to achieve more.

7. There will be a significant difference between means of English achievement gain of the two principal groups with the experimental group tending to achieve more.

8. There will be a significant difference between the means of English achievement gain of high ability and low ability students with the low ability students tending to achieve more.

One hundred fifty-seven students enrolled in six regularly scheduled English classes were assigned by classes to one of two principal groups. Two teachers participated in the study. One teacher taught four classes, two experimental and two control, and the other teacher taught two classes, one experimental and one control.

During the 1962-1963 school year, students in the experimental group received listening and reading instruction through the Listen and Read Program during the English period. This instruction included the first twenty-five tapes of the thirty-tape series, and required approximately 750 minutes of class time during the entire year. Students in the control group were presented with teacher lessons composed of the same basic concepts as those found in the first twenty-five tapes in the Listen and Read Program, but differing with respect to actual materials and mode of presentation. These were presented during the English period and required approximately 750 minutes over the entire year.

The California Test of Mental Maturity was used to determine high-ability and low-ability students in each of

the two principal groups. The Brown-Carlsen Listening Comprehension Test was used to measure listening achievement. The California Achievement Test, Reading Section and Language Section, was used to measure achievement in reading and English. The Contemporary Test of Scholastic Progress, Study Skills, was used to measure study skill achievement. Differences between pretest and posttest scores were used to determine achievement gains in the four areas.

A complex analysis of variance treatment of achievement gains was used to test the significance of all hypotheses. In comparing differences in achievement gains between the two principal groups, hypotheses one, three and seven were accepted and hypothesis five was rejected. In comparing differences in achievement gains between high ability and low ability students, hypotheses two and four were retained and hypotheses six and eight were rejected.

Conclusions

In view of the results of the investigation and within the limitations of the study, the following conclusions appeared to be justified.

1. In general, the Listen and Read Program was more effective than regular classroom teacher lessons as a method for presenting instruction in listening and reading. More specifically, this method was more effective in the areas of following directions and recognizing transitions. Both methods of presentation appeared equally effective for instruction in the specific areas of immediate recall, word meanings, lecture comprehension, vocabulary, reference skills and interpretation.

2. Generally, the Listen and Read Program and regular classroom teacher lessons were equally effective in contributing to improvement in study skills, especially in the specific area of verbal skills. However, the Listen and Read Program was more effective in the presentation of instruction in the reading of graphic material.

3. In general, the Listen and Read Program contributed significantly more than the classroom teacher lessons to achievement in basic English skills, especially capitalization. Both methods appeared to be equally effective for instruction in the specific skills of punctuation and word usage.

4. The general conclusion from the comparison of achievement gains between the two groups using the two

different methods of instruction was that the Listen and Read Program served as an effective adjunct to an eighth-grade language arts program to produce significant achievement in listening comprehension, reading ability, following directions, recognizing transitions, reading graphic material and capitalization.

5. In general, low-ability students profited significantly more in listening and reading achievement than high-ability students by receiving instruction through the Listen and Read Program. The taped exercises were especially effective in developing the reading vocabulary of the low-ability students. Both high- and low- ability students achieved equally on the specific skills of immediate recall, following directions, recognizing transitions, word meanings, lecture comprehension, reference skills and interpretation; however, the tendency for low ability students to achieve more in these specific areas, though not significantly, combined to produce significant achievement in general listening and reading ability.

6. Both high-ability and low-ability students profited equally in study skills achievement and in the specific areas of verbal and graphic interpretation after receiving instruction through the Listen and Read Program.

7. In general, both high-ability and low-ability students had similar achievement in English development and in the specific skills of punctuation and word usage. In the specific skill of capitalization, low-ability students profitted more from taped exercises than high-ability students.

8. The general conclusion from comparing the achievement of high-ability and low-ability students was that the Listen and Read Program, when used as an adjunct to the language arts program, was more effective for use with low-ability students for instruction in listening comprehension, reading ability, reading vocabulary and capitalization.

Recommendations

The evidence presented by this study suggested other areas for investigation. The following recommendations are made for future research in this area.

1. Because of the uniqueness of each school, varying programs of instruction and differences in teachers and differences in students, more investigations with the Listen and Read Program should be instituted with more

subjects in more schools on different grade levels to better understand its advantages and disadvantages.

2. Research should be designed to study the effect of the Listen and Read Program for use in the classroom with smaller groups, using ability, interest and sociometric data as criteria in grouping.

3. Research should be designed to study the effect of using listening and reading material more challenging and beneficial to the higher ability students in the Listen and Read Program.

4. Research should be designed to study the possibility of self-instruction in other subject matter fields made possible by presenting programed instruction in a language laboratory situation, with special emphasis being given to the response modes, eliciting the responses, and adaptations to individual differences.

5. Research should be designed to study the effectiveness of training regular classroom teachers to prepare taped exercises for use in daily classroom instruction, and the ways in which the teachers may best use them.

APPENDIX

COORDINATION OF LISTEN AND READ

TAPES AND TEACHER LESSONS

I. Tape #1 - "How Well Do You Listen"

Teacher lesson - Warriner, pp. 431, 432, Ex. 2, p. 432

II. Tape #2 - "Listening and Reading"

Teacher lesson - Warriner, pp. 433-441, Ex. 7, p. 437. (Relate these same principles to reading)

III. Tape #3 - "Words and Your Senses"

Teacher lesson - Neiman, "Beauty," p. 554, Ex. Kinds of Beauty

IV. Tape #4 - "Meeting New Words"

Teacher lesson - Warriner, pp. 398, 399, Ex. 1, p. 399; or Neiman, p. 253, Words in Context

V. Tape #5 - "Unlocking Sentence Meaning"

Teacher lesson - Warriner, pp. 304-308, Ex. 7, p. 307

VI. Tape #6 - "Sentences--From Simple to Complex"

Teacher lesson - Warriner, pp. 297-299, Ex. 1, p. 299.

VII. Tape #7 - "Using Signs and Signals in Reading"

Teacher lesson - Neiman, pp. 561-563, emphasis on Key Words, p. 562, pick out the key words.

VIII. Tape #8 - "Spotting Topics in Paragraphs"

Teacher lesson - Warriner, pp. 309-311, Ex. 1, p. 311

IX. Tape #9 - "Paragraph Keys"

Teacher lesson - Warriner, pp. 313-316, Ex. 2, p. 314

X. Tape #10 - "Following the Author's Organization"

Teacher lesson - Warriner, pp. 317-323, Ex. 5, p. 320

XI. Tape #11 - "Check Your Study Habits"

Teacher lesson - study skills sheet; Chandler, "Successful Adjustment in College," pp. 29-30.

XII. Tape #12 - "How to Study with SQ3R"

Teacher lesson - Neiman, pp. 318-327, read Catching Important Details, p. 319, Questions 1-4, p. 327.

XIII. Tape #13 - "Underlining with a Purpose"

Teacher lesson - Warriner, pp. 375-377, discuss what should be underlined

XIV. Tape #14 - "The Art of Note Making"

Teacher lesson - Warriner, pp. 369, 370, Ex. 4, p. 374

XV. Tape #15 - "Outlining"

Teacher lesson - Warriner, pp. 371-374, Ex. 4, p. 374.

XVI. Tape #16 - "The Language of Charts, Graphs, Maps, and Diagrams"

Teacher lesson - Warriner, lesson 266, pp. 445-446; relate to graphic presentation

XVII. Tape #17 - "Compressing Ideas, Summarizing"

Teacher lesson - Warriner, pp. 363-366, Ex. 1, p. 365.

XVIII. Tape #18 -"Shifting Gears in Reading"

XIX. Tape #19 - " Skimming and Scanning"

Teacher lesson - Neiman, pp. 156-171, read Choosing Your Reading Pace, p. 157, Checking Your Reading Pace, p. 171 (time on this lesson should equal both tapes 18 and 19)

XX. Tape #20 - "The Reading Habit"

Teacher lesson - Neiman, "My World Has Wings," pp. 3-10.

XXI. Tape #21 - "Reading Between the Lines"

Teacher lesson - Neiman, Drawing Conclusions, p. 114, 123.

XXII. Tape #22 - "The Power of Persuasion"

Teacher lesson - Neiman, pp. 199, The Language of Propaganda, and p. 236, Name-Calling.

XXIII. Tape #23 - "News of the Day"

Teacher lesson - Warriner, lesson 25d, pp. 439-441, Ex. 9, 10, 11

XXIV. Tape #24 - "Figurative Language"

Teacher lesson - Neiman, Figures of Speech, p. 133, Personification, p. 523, Comparisons, p. 528.

XXV. Tape #25 - "Finding Viewpoints in Essays"

Teacher lesson - Neiman, pp. 507-511, read Point of an Article, p. 508, Questions 1, 2, 3, p. 511.

Textbook Reference

Chandler, J. R., Beamer, G. C., Williams, C. C., and Armstrong, V. L., Successful Adjustment in College, Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1958.

Neiman, E. W. and O'Daly, E. C., Adventures for Readers: Book II, New York, Harcourt, Brace and Company, Inc., 1958.

Warriner, J. E. and Treanor, J. H., English Grammar and Composition, New York, Harcourt, Brace and Company, Inc., 1959.

BIBLIOGRAPHY

Books

Language Arts for Today's Children, The Commission on the English Curriculum of the National Council of Teachers of English, New York, Appleton-Century-Crofts, Inc., 1954, pp. 71-104.

Lindquist, E. F., Statistical Analysis in Educational Research, New York, Houghton Mifflin Co., 1940.

McNemar, Q., Psychological Statistics, New York, John Wiley and Sons, 1959.

Miles, J. R. and Spain, C. R., Audio-Visual Aids in the Armed Services, Washington, American Council on Education, 1947, pp. 30-32.

Nichols, R. G. and Stevens, L. A., Are You Listening?, New York, McGraw-Hill Book Company, Inc., 1957.

Taylor, S. E., EDL Listen and Read Program, New York, Educational Developmental Laboratories, 1962.

Articles

Anderson, H. A., "Needed Research in Listening," Elementary English, XXIX (April, 1952), 215-224.

Baker, W. D., "Listening--A Functional Part of Composition," Journal of Communication, VI (Winter, 1956), 174-179.

Borg, W. R. and Crogun, J. R., "The Teaching Machines as a Study Aid," Abstract, American Psychologist, XVI (July, 1960), 369.

Briggs, L. J., "Two Self-Instructional Devices," Psychological Reports, IV (December, 1958), 671-676.

Brown, J. I., "Construction of a Diagnostic Test of Listening Comprehension," Journal of Experimental Education, XVIII (December, 1949), 139-146.

Caffery, J., "The Establishment of Auding-Age Norms," School and Society, LXX (November, 1949), 310-312.

Canfield, G. R., "Approaches to Listening Improvement," Elementary English, XXXV (December, 1958), 525-528.

Cook, D. L., "The Hawthorne Effect in Educational Research," Phi Delta Kappan, XLIV (December, 1962), 116-122.

Cook, J. O., "Supplementary Report: Processes Underlying a Single Paired-Associate Item," Journal of Experimental Psychology, LVI (May, 1958), 455.

Cook, J. O. and Spitzer, M. E., "Supplementary Report: Prompting Versus Confirmation in Paired-Associate Learning," Journal of Experimental Psychology, LIX (April, 1960), 275-276.

Coulson, J. E. and Silberman, H. F., "Effects of Three Variables in a Teaching Machine," Journal of Educational Psychology, LI (June, 1960), 135-143.

Dow, C., "Integrating the Teaching of Reading and Listening Comprehension," Journal of Communication, VIII (Autumn, 1958), 118-126.

_____, "Listening Instruction at Michigan State," Journal of Communication, V (Autumn, 1955), 110-112.

Erickson, A., "Can Listening Efficiency Be Improved?" Journal of Communication, IV (Winter, 1954), 128-132.

Feldjusen, J. F., "Taps for Teaching Machines," Phi Delta Kappan, XLIV (March, 1963), 265-267.

Fulton, R. J., "Language Laboratories Develop the Listening Ear," Modern Language Journal, XLIII (May, 1959), 224-225.

Furness, E. L., "Improving Reading Through Listening," Elementary English, XXXIV (September, 1957), 307-311.

Gibson, R., "Can Tapes Teach?" Educational Screen, XXXVII (April, 1958), 180-181.

Goldstein, L. S. and Gotkin, L. G., "A Review of Research: Teaching Machines vs. Programmed Textbooks as Presentation Modes," Journal of Programed Instruction, I (1963), 29-36.

Goldbeck, R. A. and Campbell, V. N., "The Effects of Response Mode and Response Difficulty on Programed Learning," Journal of Educational Psychology, LIII (June, 1962), 110-118.

Griffin, K. and Hanna, L., "A Study of the Results of an Extremely Short Instructional Unit in Listening," Journal of Communication, X (September, 1960), 135-139.

Hampleman, R. S., "Comparison of Listening and Reading Comprehension Ability of Fourth and Sixth Grade Pupils," Elementary English, XXXV (January, 1958), 49-53.

_____, "Listening," Educational Screen, XXXVI (April, 1958), 175-179.

Heilman, A., "An Investigation in Measuring and Improving the Listening of College Freshman," Speech Monographs, XVIII (November, 1951), 302-308.

Hollow, M., "Listening Comprehension at the Intermediate Grade Level," Elementary School Journal, LVI (December, 1955), 158-161.

Holt, H. O. and Hammock, J., "Books as Teaching Machines: Some Data," Applied Programed Instruction, edited by S. S. Marqulies and L. D. Eigen, New York, John Wiley and Sons, Inc., 50-56.

Hosey, G. V., "Better Speech Through Better Listening," Journal of Business Education, XXXIV (January, 1959), 172-173.

Israel, M. L., "Variably Blurred Prompting: Methodology and Application to the Analysis of Paired-Associate Learning," Journal of Psychology, L (July, 1960), 43-52.

Johnston, M. C., "Foreign Language Instruction," Review of Educational Research, XXXI (April, 1961), 188-96.

Keislar, E. R. and McNeil, J. D., "A Comparison of Two Response Modes in an Auto-Instructional Program with Children in the Primary Grades," Abstract, American Psychologist, XVI (July, 1961), 369.

King, P. E., "Teaching Machines and the Language Laboratory," American School Board Journal, CXLI (August, 1960), 17-18.

King, W. H., "An Experimental Investigation into the Relative Merits of Listening and Reading Comprehension for Boys and Girls of Primary School Age," British Journal of Educational Psychology, XXIX (February, 1959), 42-49.

Klaw, S., "What Can We Learn from the Teaching Machine?" The Reporter, July, 1962.

Koekkoek, B. J., "The Advent of the Language Laboratory," Modern Language Journal, XLIII (January, 1959), 4-5.

Koess, W. and Zeaman, D., "Positive and Negative Knowledge of Results on a Pressey-Type Punchboard," Journal of Experimental Psychology, LX (July, 1960), 12-17.

Krumboltz, J. D. and Weisman, R. G., "The Effect of Overt vs. Covert Responding to Programed Instruction on Immediate and Delayed Retention," Journal of Educational Psychology, LIII (April, 1962), 89-92.

Langsam, R. S., "A Factorial Analysis of Reading Ability," Journal of Experimental Education, X (September, 1941), 57-63.

Larew, L. A. and Lottes, J. J., "Tape Recorder versus the Teacher in Spanish Class," The Elementary School Journal, LXII (March, 1962), 199-202.

Larsen, R. P. and Feder, D. D., "Common and Differential Factors in Reading and Hearing Comprehension," Journal of Experimental Education, XXXI (May, 1940), 241-252.

Lewis, M. S., "Teaching Children to Listen," Education, LXXX (April, 1960), 455-459.

Loder, J. E., "A Study of Aural Learning with and without the Speaker Present," Educational Screen, XXXVII (April, 1958), 176-177.

Mathieu, G., "Language Laboratories," Review of Educational Research, XXXII (April, 1962), 168-178.

McNeil, J. D., "Programed Instruction as a Research Tool in Reading: An Annotated Case," Journal of Programed Instruction, I (1963), 37-42.

Mead, R. S., "Stop-Gap FLES?" Hispania, XLIV (March, 1961), 147.

Melaragno, R. J., "Effects of Negative Reinforcement in an Automated Teaching Setting," Psychological Reports, VII (October, 1960), 381-384.

Morton, R. R., "The Language Laboratory as a Teaching Machine," Part 2, International Journal of American Linguistics, XXVI (October, 1960), 113-166.

Needham, A., "Listening Exercises with a Purpose," Education, LXXV (January, 1955), 311-315.

Newman, S. E., "Student vs. Instructor Design of Study Methods," Journal of Educational Psychology, XLVIII (October, 1948), 328-333.

Nichols, R. G., "Factors in Listening Comprehension," Speech Monographs, XV (No. 2, 1948), 154-163.

Nichols, R. G. and Cashman, P. H., "The Approval Factor in Listening," Education, LXXX (January, 1960), 268-271.

Oakes, W. F., "Use of Teaching Machines as a Study Aid in an Introductory Psychology Course," Psychological Reports, VII (October, 1960), 297-303.

O'Connor, O. M., "The Art of Listening," Educational Screen and Audio-Visual Guide, XXXVIII (October, 1959), 523.

Pickrel, G., Neidt, C., and Gibson, R., "Tape Recordings Are Used to Teach Seventh Grade Students in Westside Junior-Senior High School, Omaha, Nebraska," Bulletin of the National Association of Secondary School Principals, XLII (January, 1958), 81-93.

Porter, D., "Some Effects of Year-Long Teaching Machine Instruction," Automatic Teaching: The State of the Art, New York, John Wiley and Sons, 1959, 85-90.

Pratt, E., "Experimental Evaluation of a Program of Improvement of Listening," Elementary School Journal, LVI (March, 1956), 315.

Pressey, S. L., "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Concomitant Self-Instruction," Journal of Psychology, XXIX (April, 1960), 417-447.

Rankin, P. T., "The Importance of Listening Ability," English Journal, XVII (October, 1928), 632-630.

Roe, A., "A Comparison of Programed Texts, Multiple-Choice Machines, Free-Response Machines, Programed Lectures, and Standard Lectures," Abstract, American Psychologist, XVI (July, 1961), 369.

Rothkopf, E. Z., "Automated Teaching Devices and a Comparison of Two Variations of the Method of Adjusted Learning," Psychological Reports, VIII (September, 1961), 163-169.

_____, "Programed Self-Instructional Booklets, Mnemonic Phrases, and Unguided Study in the Acquisition of Equivalences," Journal of Programed Instruction, I (1963), 19-28.

Russell, R. D., "A Comparison of Two Methods of Learning," Journal of Educational Research, XVIII (October, 1928), 235-238.

Shay, C. B., "Relationship of Intelligence to Step Size on a Teaching Machine Program," Journal of Educational Psychology, LII (February, 1961), 98-102.

Shettel, H. H. and Lindley, R. H., "An Experimental Evaluation of Two Types of Self-Instructional Programs for Teaching a Paired-Associate Task," Abstract, American Psychologist, XVI (July, 1961), 369.

Sidowski, J. B., Kopstein, F. F., and Shillestead, I. J., "Prompting and Confirmation Variables in Verbal Learning," Psychological Reports, VIII (June, 1961), 401-406.

Silberman, H. F., "Characteristics of Some Recent Studies of Instructional Methods," Programmed Learning and Computer-Based Instruction, edited by J. Coulson, New York, John Wiley and Sons, Inc., 1958.

_____, "Self-Teaching Devices and Programmed Materials," Review of Educational Research, XXXII (April, 1962), 179-193.

Silberman, H. F., Melaragno, R. J., and Coulson, J., "Confirmation and Prompting with Connected Discourse Material," Psychological Reports, IX (October, 1961), 235-238.

Silberman, H. F. and others, "Fixed Sequence vs. Branching Auto-Instructional Methods," Journal of Educational Psychology, LII (June, 1961), 166-172.

Silverman, R. E. and Alter, M., "Note on the Response in Teaching Machine Programs," Psychological Reports, VII (December, 1960), 496.

Skinner, B. F., "Teaching Machines," Science, CXXVIII (October, 1958), 969-977.

Smith, D. V., "Learning to Listen, Listening to Learn in the Elementary School," National Education Association Journal, XLVII (February, 1958), 100-101.

Smith, E. A. and Quackenbush, J., "Devereux Teaching Aids Employed in Presenting Elementary Mathematics in a Special Education Setting," Psychological Reports, VII (October, 1960), 333-336.

Stack, E. M., "Patterned Drills for the Language Laboratory," French Review, XXXIII (January, 1960), 272-280.

Wagner, G. W., "What Schools Are Doing in Developing Listening Power," Education, LXXVIII (December, 1957), 247-252.

Wepman, J. M., "Auditory Discrimination, Speech and Reading," Elementary School Journal, LX (May, 1959), 325-333.

Zuckerman, C. B., Marchall, G. R., and Groesberg, S., "Research in the Automation of Teaching," NAVTRADEVCEN, Port Washington, New York, U. S. Naval Training Device Center, February, 1961, pp. 666-671.