THE EFFECT OF HIGHLIGHTING MAJOR POINTS WITHIN RECORDED MATERIAL AS A MEANS OF INCREASING LISTENING COMPREHENSION OF FIFTH AND SIXTH GRADE PUPILS WITH POOR READING SKILLS

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ABSTRACT

THE EFFECT OF HIGHLIGHTING MAJOR POINTS WITHIN RECORDED MATERIAL AS A MEANS OF INCREASING LISTENING COMPREHENSION OF FIFTH AND SIXTH GRADE PUPILS WITH POOR READING SKILLS

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This study evaluated the effectiveness of two auditory highlighting strategies that were devised to aid listening comprehension of fifth and sixth graders. Fifty-eight subjects were used in this study and were identified as having learning disabilities and/or reading problems that contributed to their academic difficulties. It was theorized that subjects who are poor readers (reading comprehension level 2 or more years below expected reading level) would represent a sample population of students that learn primarily through the auditory channel.

Two specific auditory highlighting strategies were used separately to cue the listener to major points within recorded passages. These highlighting strategies were referred to as "voice cue" and "pause cue" treatments. The "voice cue" treatment used a recorded female voice for major points that were dubbed in place of the recorded male voice of the passages used in this study. "Pause

cues" used a tape recorder (Audiomate 590) that enables one to record signals on the recording to stop the recorder before the selected major points. The subjects were informed of this procedure and instructed to push a restart button to hear the major point.

The STEP Listening Test (Level 4A & 4B) was used as the criterion task to determine the effectiveness of the auditory highlighting procedures. A recorded copy of the STEP Test for each form was made using the highlighting procedure throughout (pause cue or voice cue) and a third set was made of Level 4A and 4B using no cues or highlighting procedure. The first two groups compared the two highlighting procedures to determine if one technique was more effective than the other. Groups III and IV received one treatment cued (voice or pause) and the other trial with no highlighting procedures employed to determine if cued treatments were more effective means of increasing listening comprehension.

No significant difference was found for the means scores on the STEP Listening Test at the .05 level of confidence for the four groups. However, the mean scores were in favor of the highlighted or cued treatments. There were no consistent findings for the four groups when the test scores of the STEP were subdivided into types of material (Directions, Exposition, Narration, Argument, and Aesthetic Material). Measures of visual memory and auditory

memory from the Detroit Tests of Learning Aptitude obtained initially for each subject were found to be related in several instances with difference scores between the two treatment trials. Pupil preference for a specific type of highlighting procedure was found to be related to actual scores achieved by the majority of the subjects. The "pause cue" technique was the most preferred technique chosen by the subjects in this study.

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CHAPTER I

INTRODUCTION

It is generally considered that the three primary channels for receiving information in today's educational programs are visual, auditory, and haptic (kinesthetic and tactile). This should not be interpreted as saying that other channels are excluded, such as smell, taste, temperature, pressure, pain or others. These other sensory channels although limited in their use in public school programs for the handicapped are not totally ignored. The teaching ideas of Montessori (Lillard, 1972)[1] and the work of Dailey[2] (1971) do incorporate taste and smell into the learning experience. Use of the visual channel as required in "reading" receives the most emphasis in research, instructional procedures, and remedial techniques. (Anderson, 1952)[3] (Duker, 1971)[4] Tactile and kinesthetic learning as used in the reading of "Braille" has also received a great deal of emphasis in research and instruction procedures from educators serving the blind and partially sighted. (Lowenfeld, 1969)[5] (Nolan, 1963)[6]

Auditory learning or "listening/auding" is perhaps the most neglected area in terms of research, instructional

procedures, and remedial techniques. (Anderson, 1952)[7] (Devine, 1967)[8] (Lundsteen, 1971)[9]

Wayne D. Lance (1973)[10] in the monograph "Instructional Media and the Handicapped" points out,

> "The audio tape recorder, which has become almost as common a piece of equipment in classrooms for the handicapped as the overhead projection, has received relatively little coverage in the literature, perhaps due to the rather straight-forward advantages in this media." p. 13

The advantages of this medium are numerous, but the need to determine effective, more interactive and personalized ways to use this medium must be explored. Listening is a specific skill that is viewed by many educators as one that can be taught as any other communication skill (reading, speaking, or writing). There are many studies reported in the literature that deal with the measuring of listening: (a) time (Rankin, 1926)[11] (Wilt, 1950)[12], (b) comprehension (Spearritt, 1962)[13] (Durrell, 1969)[14], (c) rates (Foulke, 1973)[15] (Gore, 1968)[16] (Fergen, 1954)[17], (d) instructional programs effectiveness (Fawcett, 1966)[18] (Russell, 1964)[19], and (e) easy and difficult material (Kibler, 1962)[20]. While all of this information is necessary, it would appear that information on techniques or procedures to enhance and/or improve listening of tape recorded material is also important.

Specifically, the technique of highlighting tape recorded materials to give the listener clues to major points, as the use of italics, quotation marks, bold face

print, and underlining does in reading, needs to be further explored. This type of information would be useful for children with reading difficulties, children with learning disabilities that prefer the auditory channel for learning, the blind and partially sighted that depend a great deal on recorded material, to name a few groups that use recorded material for instructional purposes.

There have been numerous studies dealing with the effectiveness of sensory channels, but relatively few with specific interest in means for increasing the effectiveness or, facilitating learning, through manipulations of elements within the particular sensory channel. It is also true that certain types of material may be learned more readily through a particular channel. As Twyford (1973)[21] states, "On the basis of available research the effectiveness of a particular instructional material is more dependent upon the nature and quality of the message than the characteristics of the channel of communication." He further points out that instructional activities or material that were most effective incorporated much information in a concise form.

This study had the students participate in the evaluation of certain auditory learning techniques as suggested in the report by Twyford (1973)[22]. A questionnaire was administered to all subjects at the end of the two trial experiments to determine student's preference and acceptance of the procedures used in the study.

Guidelines developed by Briggs et al. (1967)[23] were employed in designing this media instruction. They were as follows: 1. Stating the Objectives, 2. Identifying the Type of Learning, 3. Designing a Media Program, 4. Preparing Summaries of Sequences of Media Alternatives, 5. Selection of Media, 6. Preparing the Specifications, and 7. Conducting Tryout and Revisions of the Materials.

Four instructional events were employed in this study: 1.) Inform learner about performance required, 2.) Stimulate recall of component concepts, 3.) Verbal cueing, 4.) Appraisal. This study is intended to provide data regarding the effect of highlighting recorded material to cue the listener. "Voice cues" and "pause cues" were employed to signal or highlight major points within passages in an attempt to facilitate listening comprehension of pupils with reading difficulties and/or learning disabilities.

Data from this study may provide educators with evidence upon which decisions can be made in developing tape recorded lessons for the poor or non-reader. The study may also provide preliminary criteria used to determine those type of learners who may profit most from these types of auditory cueing.

THE PROBLEM

Statement of the Problem

The purpose of this study was to obtain information that will assist educators who are seeking ways and means to improve or assist auditory comprehension of audio recorded material. This study evaluated two specific instructional strategies devised to highlight or cue major points within recorded passages for the listener. One strategy used in this study will be referred to as "voice cue" which is the use of a second voice in place of the original recorded voice for cueing major points within passages. The second strategy used will be referred to as "pause cue" whereby the tape recorder stops automatically at predetermined points within the passages to highlight major points for the listener. There were three independent experimental conditions; (1) tape recorded passages with "voice cue" highlighting throughout, (2) tape recorded passages with "pause cue" highlighting throughout, and (3) tape recorded passages with no cues or highlighting. The criterion task scores were compared using the comprehension scores achieved by the listeners with and without highlighting.

Background to the Problem

A listening activity requires many tasks of the listener when sorting and storing the significant information from the transitory fading auditory sensations. Fessenden (1955)[24] has theorized seven levels of listening: (1) the first level is to isolate sounds, ideas, arguments, facts, organization, and the like. (2) the second level is to identify or give meaning to the aspects isolated, (3) the third level is to integrate what we hear with past experiences, (4) the fourth level is to inspect the new, (5) the fifth level is to interpret what we hear, (6) the sixth level is that we interpolate comments and statements, and (7) the seventh level is that we learn to introspect as well as listen. Highlighting recorded material at major points by the use of a "voice cue" or "pause cue" is intended to focus the listener's attention more closely to the first two levels and thereby aid listening comprehension.

The use of cueing or highlighting material to be learned has been reported in many studies dealing with the facilitation of visual learning. There is not however a great deal of research that supports cueing with auditory learning. We know cueing can assist verbal learning as suggested by Jung (1968).[25] He reports learning (serial and paired associate) with cued conditions was found to assist recall, when employed during the initial presentations or during retesting under cued conditions. At this

time there is sparse research existing in regard to specific cue utilization techniques with tape recordings. Campeau (1967)[26] states, "This (lack of research) is due in part to the small number of relevant classroom studies which have been published, and in part to inconclusive findings where evidence is available." This apparent lack of research on the role or impact of specific strategies used to cue recorded material led the examiner to focus on cues to aid the listener. This study will attempt to provide some insight to the question: What effect if any, does the highlighting of recorded material by the use of "voice cues" and/or "pause cues" have upon the listener's comprehension level?

Definition of Terms

1 - attention - a sensory adjustment providing for optimal stimulation of a sense modality. (Good, 1959)[27]

2 - auding - this term although not widely used will be used synonymously with listening and listening comprehension. It is defined as the act of receiving a continuous flow of words that are translated in meaning and involves one or more avenues of thought. (Taylor, 1964)[28]

*For a more complete discussion of the terms listening and auding one should refer to the article by Toussaint, Isabella in Duker, 1966, pp. 155-164.

3 - audio - pertaining to the transmission or reception of sound. (Good, 1959)[29]

4 - auditory learner - the subject who favors and learns more easily from auditory or oral instruction, than with similar material presented as a visual task, such as, reading.

5 - auditory memory span - the number of related or unrelated items that can be recalled immediately after one hearing. (Good, 1959)[30]

6 - highlighting - to make prominent. Specifically, the application of cues (verbal or non-verbal) to major points within a recorded passage in an attempt to focus one's auditory attention.

7 - listening comprehension - the skill or ability to interpret and recall information received by listening to a passage presented orally.

8 - pause cue - a non-verbal clue, whereby the tape recorder stops automatically before major points within a recorded passage, and is intended to focus the subject's attention to the upcoming passage when the recorder is restarted.

9 - recordings - audio tape recordings of specific passages or instructional information.

10 - visual memory - memory of things seen. (Good, 1959)[31]

11 - voice cue - a sound quality cue using a recording of a woman's voice in place of the original recording of

major points within a recorded passage, that is intended to call attention to or highlight major points for the listener.

Assumptions and Limitations

The following assumptions are made with regard to the importance of auditory and verbal learning:

1. auditory learning skills are important in one's educational achievement and progress.
2. language facility and comprehension is important in educational achievement.
3. auditory learning can be enhanced through use of highlighting or cueing techniques.
4. auditory highlighting that cues the learner by verbal or non-verbal stimuli is similar or possibly an equivalent task to learning to recognize and focus on printed material that is cued by italics, quotation marks, underlining, or bold face print.

The following limitations underlie this study:

1. other, non-auditory sensory systems are important channels for learning, but they are not the focus of this study.
2. auditory learning has many facets, but only one area, highlighting or cueing, is of prime concern in this study.

3. those limitations inherent in the specific techniques selected for use in this study and the subjects and conditions by which the study was conducted.

Design of Study

The population of this study consisted of 58 fifth and sixth students enrolled at Howell Middle School, Howell, Michigan: Waverly Junior High and Waverly Learning Center, and Webberville Middle School, Webberville, Michigan. The students selected for this study were attending regular classes, but were receiving special assistance for reading and/or academic difficulties. All students were reading at least two years below their expected grade level and were of average or near-average intelligence. Students were being served by teacher consultants for learning disabilities and/or special reading improvement programs.

Each student was screened to determine if they met the basic requirements for inclusion in the study. Students in the fifth and sixth grades were currently being served by a teacher consultant, resource center, or special class for their reading and/or academic difficulties. The students were referred by the teacher consultants to the examiner. Pupils' permanent records were checked for birthdates, intelligence quotients, reading levels, and screening tests for vision and hearing losses.

Each student was serially assigned to one of four treatment groups. All students received two treatments that consisted of two listening comprehension tests in which the highlighting procedure varied.

The raw scores for each listening comprehension test were tabulated and compared to determine if the null hypotheses were to be rejected.

Hypotheses

There are seven major hypotheses with this study. The hypotheses, stated as null hypotheses, are as follows:

Hypotheses Related to Effects of Highlighting Recorded Material

1 - There will be no significant difference ($p<.05$) between the means of total comprehension scores with the "voice cue" treatment and the "pause cue" treatment with groups 1 and 2.

2 - There will be no significant difference ($p<.05$) between the means of total comprehension scores with the "voice cue" treatment and the "no cue" treatment with group 3.

3 - There will be no significant difference ($p<.05$) between the means of total comprehension scores with the "pause cue" treatment and the "no cue" treatment with group 4.

4 - There will be no significant difference ($p<.05$) between the means of subtest comprehension scores on all types

of materials with the "voice cue" treatment and the "pause cue" treatment with groups 1 and 2.

5 - There will be no significant difference ($p<.05$) between the means of subtest comprehension scores on all types of materials with the "cued" treatment and the "no cue" treatments used with groups 3 and 4.

Hypotheses Related to Sensory Memory Test Scores and Listening Comprehension

6 - There will be no relationship between scores achieved on a test of "auditory memory" and comprehension scores achieved under any treatment condition.

7 - There will be no significant relationship between the scores achieved on a "visual memory" test and comprehension scores achieved under any treatment condition.

CHAPTER I

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CHAPTER II

REVIEW OF LITERATURE

There has been little research accomplished to date in the area of interest expressed in this study. Campeau (1967)[1] reported in a review of literature on audiovisual media of instruction, " . . . no experimental analysis of specific utilization techniques of the media (radio/ recordings) and no basic research reports on radio and recordings were discovered during this literature search." The experimenter made further confirmation on this with conversations with Dr. Paul Witt, Dr. Curtis McCarty, and Dr. James Nord of the Instructional Media Center at Michigan State University in January of 1974. With the exception of general studies reported in the literature on tape recorded and radio instruction, no comparable studies encompassing the variables for this specific study were located.

It must, however, be stated that many previous research studies have investigated variables that do pertain to this proposed study. These studies have been reviewed and categorized, when appropriate, into one of five areas. These areas are: (1) Listening & Listening Comprehension, (2) Strategies for Improving Listening, (3) Teaching

Considerations, (4) Listening and Psychometric Variables, and (5) Media Instruction.

Listening and Listening Comprehension

Listening is recognized to be the first and the most basic area of language development. (Hildreth, 1948)[2] (Lundsteen, 1971)[3] During the 1950's and through the early 1960's we find the literature focusing on how listening was being neglected, not only as an area of instruction in the schools, but as an object of research study. (Anderson, 1952)[4] (Duker, 1969)[5] A report by Anderson in 1952[6] indicated over 3,000 studies made in reading as compared to 175 on listening, of which, only 50 could be classified as research. This is still the picture today, however, a vast resource of previous research findings in listening needs to be drawn together. Several individuals have contributed a great deal to this effort. (Duker, 1966, 1968, 1971, 1971)[7] (Lundsteen, 1971)[8] (Nichols, 1948, 1957)[9] (Taylor, 1964)[10]

Burns and Lowe (1966)[11] stated, "Four centuries of the printing press have made people print minded, . . . Now, in the past thirty years, advances in radio, sound recordings, and television have helped to point up the need for literacy of the spoken word." They further state, "the typical individual listens one book per day, talks one book per week, reads one book per month, and writes one book per year." (Burns and Lowe, 1966)[12] Schools are reported to

be spending 52% of their classroom time teaching reading, but only 8% promoting listening and speaking skills. (Gallagher, 1963)[13]

The need for research in the area of listening is compounded when one considers the frequency of use in education and new material and equipment developments, but one must not ignore the findings of previous studies, no matter how small or obvious they may appear. Duker (1969)[14] and others have pointed out that research on listening should expand the previous findings of studies and dissertations into working models and materials. Witty and Sizemore (1959)[15] suggested that we abandon attempts to ascertain the superiority of one avenue of presentation (auditory vs visual) over another. This makes a great deal of sense primarily because certain stimuli are inherently received through a single sensory channel.

Listening Comprehension

A great deal of the previous research and writings in the area of listening have focused on the effect of training listening skills, testing listening comprehension, and comparing listening skills with reading, achievement, and intelligence levels. (Spearritt, 1962)[16] These factors are important and a few of the general findings are as follows:

1. Low ability students benefit from training programs for improving listening. (Marsden, 1953)[17] (Bakan, 1956)[18] (Canfield, 1961)[19] (Kraner, 1964)[20]
2. Slow readers and poor readers show a preference for oral presentations. (Friedman, 1959)[21] (Schmidt, 1944)[22] (Early, 1958)[23] (Fenwick, 1971)[24]
3. Children in grades four, five, and six appear to acquire information more readily from listening than reading. (Caughran, 1953)[25] (Witty & Sizemore, 1959)[26] (Hampleman, 1955)[27] (Fawcett, 1966)[28] (Erickson & King, 1917)[29]
4. The listening vocabulary is much superior to the reading vocabulary. At grade five, reading comprehension reaches ninety percent of listening comprehension; the two abilities are equal in the eighth grade. (Durrell, 1969)[30]

Strategies for Improving Listening

Other research studies point out teaching strategies that should be used in teaching the auditory learner and in developing instructional materials.

1. A change or switch of voices, note taking, interaction with an object related to the listening activity helps to maintain one's attention. (Allen, 1960)[31] (Farrow, 1964)[32] (Hanley, 1956)[33] (Harrell & others, 1949)[34] (Newman and Highland,

1956)[35] (Linsley, 1961)[36] (Witkin, 1971)[37] (Webster & Thompson, 1954)[38]

2. The greatest source of errors in listening arises from dificiencies in vocabulary. (Brown, 1950)[39] Increasing the reading vocabulary helps the listening vocabulary. (Dawson & Zollinger, 1960)[40]
3. When informational content is attenuated, as much as sixty percent of each message was understood (two overlapping messages), increasing the auded information per unit of time. (Webster & Thompson, 1954)[41]
4. Some features identified that affect listeners recall of radio broadcasts are: a) limited number of items, b) human interest, c) index words, and d) dramatic events. (Harrell, Brown & Schramm, 1949)[42]
5. When the listener is required to piece together fragments of speech and make a correct response, voice change was helpful. (Hanley, 1956)[43]
6. Careful planning of listening experiences can bring about significant improvement without direct teaching of listening skills. (Canfield, 1960)[44]
7. Carroll (1972)[45] suggested that pauses inserted into time-compressed materials might improve comprehensibility of the materials. Research by

Friedman and Johnson (1969)[46] did confirm this with four speech rates using pauses, which resulted in the same amount of recall. This is reported as replicating the previous findings of Miller and Isard (1963).[47]

8. Sticht (1972)[48] reports on a study by Friedman, Graae, and Orr (1967) in which they used the technique of presenting a cueing tone to alert listeners to important segments of a recorded message. He indicates that this may be viewed as somewhat analogous to use of underlining or capitalization. Although the results of this study did not indicate a facilitation effect due to cueing, Sticht suggests that this may have been due to the fact that the tone was not coded to signal any type of information processing strategy. He also suggested that a question follow the cued passage segment to serve as a guide and to terminate the processing of the cued information.

Teaching Considerations Using Listening

1. Intuitive judgements of both teachers and pupils are untrustworthy criteria of the actual ability of a pupil to listen. (Hall, 1954)[49]
2. The oral method of presenting certain types of examinations (True-false and multiple choice) is as effective a method as that involving the

presentation in written form. (Witty & Sizemore, 1959)[50]

3. Children who do poorly on auditory discrimination tests may still learn better by listening. (Murphy, 1972)[51]

Listening and Psychometric Variables

A great deal of existing research on listening has focused on the search for related factors. Spearritt (1962)[52] and Nichols (1952)[53] have summarized many of the findings that have investigated related variables. They point out that research on listening comprehension seems to indicate the following:

1. Reading and listening comprehension appear to be related with correlations varying from .4 to .8 in studies reviewed.
2. Higher correlations with reading and listening are found in the upper grades.
3. Intelligence and listening comprehension correlations are similar to those found with reading comprehension and listening comprehension.
4. It appears that a variable affecting correlations with listening comprehension and intelligence is the degree of verbal and non-verbal content in the intelligence tests used in the studies.

5. Reading and listening comprehension studies indicate they are approximately equal in terms of efficiency in learning.
6. Listening studies conducted in the elementary schools, high schools, and colleges suggest that listening is relatively more effective than reading in the lower grades for effecting comprehension.
7. Reading comprehension is favored when the subject material becomes more difficult, and the auditory mode of listening is superior with easy material.

Additional specific points that Nichols (1952)[54] has reported from previous research studies on listening include:

1. "It is difficult to generalize accurately with respect to the efficiency of listening as a medium of learning." Studies have shown retention to vary from ten to seventy percent after two to three months.
2. Recall of learning through listening after two months or more seldom exists beyond the twenty-five percent level of efficiency.

Further points of interest that Spearritt (1962)[55] has reported that are worthy considerations with regard to listening comprehension are:

1. "In an exploratory investigation of this area, there would appear to be an advantage in using groups at the upper elementary or early secondary

school levels, by which stage reasonable proficiency in both listening and reading could be expected."

2. The most appropriate rate for presenting tests by means of tape recordings would appear from the evidence to be 150 words per minute.
3. The effect of distortion of speech due to variation in intelligibility or time intervals on the performance on listening comprehension tests has not been explored.
4. Comprehension in the early grades of the elementary school is clearly more dependent on listening than on reading.
5. Variation in length of passage between 100 words and 700 words has been found to have no effect on the relative standing of fourth and sixth grade children on listening comprehension tests.
6. It appears that children with moderate hearing loss do at least as well as those with no hearing problems on listening comprehension tests.
7. There are strong theoretical and empirical grounds for the use of recorded tests spoken by one person in comparative studies of listening comprehension.

Sticht (1972)[56] in a paper presented to a workshop on Language Comprehension and the Acquisition of Knowledge, and a text of the papers presented, edited by Carroll and

Freedle (1972)[57] reports on specific research with men in Army training classes and reviews research on learning by listening. Among the various points that are presented, the following appear to have application to this proposed study:

> Many poor-readers (men in Army training classes) stated a preference for learning by listening. Preference for learning by one modality or another does not mean that learning will be accomplished under the preferred modality or will information on job operations be sought after in this modality. He further states, ". . . the provision of listening materials in addition to reading materials in training programs and in on-the-job training might motivate learning where it otherwise would not even be attempted."

Media Instruction

Smith and Nagel (1972)[58] reporting the findings of an NEA survey of 1,609 teachers made in 1967 revealed that 53.8% were using audio tape recordings for instructional purposes. The true advantages of this media equipment have been virtually untapped. This study will attempt to determine if strategies, such as pause cue or voice cue, can indeed aid listening comprehension of audio recorded material. The tape recorder is an economical and easily used media item that is receiving increased use in the

public schools. Twyford (1960)[59] stated, "Very little research has been done to define the new role of the teacher when media are employed to simplify the instructional task and to increase the number of students that can be handled." Although this study will not investigate this directly, it will be considered and discussed in the final chapter dealing with recommendations.

Summary

The cited literature does give credibility to the proposed study and the variables to be examined. Specifically, these supportive factors are as follows:

1. The role listening plays in the individuals' everyday life experiences is very high.
2. Use and availability of the tape recorder in school programs today has greatly increased.
3. Fifth and sixth pupils have a preference for oral presentations over reading.
4. Pupils in the elementary schools acquire information more readily from listening.
5. Pupils who are experiencing academic difficulties due to reading problems and/or learning disabilities tend to learn more by listening, although this modality may not be the most efficient for an individual.
6. There is little evidence to support the principle that one can rely on pupils' judgements of their

ability to learn by listening as opposed to learning by reading.

7. Auditory learning can be enhanced by cueing or prompting.
8. A change in activity or interaction with an object related to the listening activity aids attention.
9. Some types of materials are learned more easily than other types with oral presentation as opposed to visual presentation.
10. Specific planning of listening experiences can improve listening without directly teaching listening skills.

CHAPTER II

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CHAPTER III

DESIGN OF THE STUDY

Introduction

This study was designed to determine the effects of auditory highlighting upon listening comprehension scores of elementary students identified as having reading problems. The lack of specific research studies on elementary pupils who rely on their listening abilities to acquire new knowledge because of low reading levels gave the examiner the impetus to conduct this study. The "Design of the Study" will be presented under the following headings: Subjects, Test Description, Audio Equipment, Pilot Study, and Procedure.

Subjects

Pupils in the fifth and sixth grades from four schools, Howell Middle School, Waverly Learning Center, Waverly Junior High, and the Webberville Middle School, in the Lansing, Michigan area were used in the study. A total of 13 students were referred to the examiner from the Howell Middle School, 14 from the Waverly Junior High School, 14 from the Waverly Learning Center, and 17 pupils from the Webberville Middle School. A total of fifty-eight subjects

were selected from the four public school programs. They were all identified as under achieving as a result of low reading levels and/or learning disabilities.

All subjects were initially referred to the examiner by teacher consultants for learning disabilities or remedial reading consultants. Pupils had to meet the following criteria to be referred for inclusion in the study:

1. Presently in the fifth or sixth grade.
2. Reading level 2 years or more below expected grade level. (Two exceptions to this criterion are noted below.)
3. Average of near average intelligence quotient.
4. Served by a teacher consultant or special program for their reading and/or academic difficulties.

All subjects were being served in special programs because of reading and/or academic achievement difficulties. The special programs were: resource learning center for children with learning disabilities (pupils segregated 1/2 days - 4 days/week), teacher consultants for children with learning disabilities (pupils served within the regular classes on a referral basis), and special classes for remedial reading instruction. Fourteen pupils were being served in the resource center, twenty-seven pupils were being served by a special reading class on a daily basis, and seventeen were being served within their regular classes by a teacher consultant for learning disabilities.

Subjects were evenly distributed in the fifth and sixth grades with twenty-nine in each grade. All but two

subjects were reading not less than two years below expected grade level as measured by group achievement tests given in January and February of 1974. The two subjects (#2 in group II and #1 in group III in Tables IB & IC) were included in the study because their teachers reported that their scores were higher than their instructional level. The two students were achieving satisfactorily with 3.5 level reading materials. The chronological age range for the population was 10 years 1 month to 13 years 7 months. The I.Q. range was 80 to 114 with a mean I.Q. of 92.6. I.Q. scores were obtained from the pupils permanent record folders and were from group intelligence tests administered within the past two years. Eleven pupils had psychological reports in which case the I.Q. score used was from an individual I.Q. test (Wechsler Intelligence Scale for Children). Tables IA, IB, IC, ID, and II contain individual and group pupil identification data.

The four different schools were used to provide a representative group of children from various geographic, social, and cultural backgrounds. Subjects' school records were reviewed to check results of vision and hearing tests administered by the Michigan State Department of Public Health to eliminate any subject with significant uncorrected visual or auditory acuity deficits.

Subjects were serially assigned within each school to one of the four experimental groups for the purpose of testing the null hypotheses.

TABLE IA

GROUP I PUPIL IDENTIFICATION DATA DISTRIBUTION

Subject	Chronological Age	Intelligence Quotient	Grade Placement	Reading Level	School
1	11-10	89	5.9	3.0	WLC
2	11-11	92	5.9	2.0	WLC
3	10-1	93	5.9	2.1	WLC
4	11-1	91	5.9	1.8	WLC
5	12-0	89	6.9	2.2	WJH
6	12-1	111	6.9	3.0	WJH
7	12-9	99	6.9	3.2	WJH
8	11-5	103	6.9	3.8	WJH
9	13-1	82	5.9	2.6	HMS
10	13-3	80	5.9	2.6	HMS
11	12-10	99	6.9	3.4	HMS
12	10-8	98	5.9	3.7	HMS
13	11-8	96	6.9	3.8	WMS
14	11-8	87	6.9	4.4	WMS
15	12-3	99	5.9	2.2	WMS
Mean	11-11	93.87		2.92	
Range	10-1 to 13-3	80 to 111		1.8 to 3.8	

WLC = Waverly Learning Center
WJH = Waverly Junior High
HMS = Howell Middle School
WMS = Webberville Middle School

TABLE IB

GROUP II PUPIL IDENTIFICATION DATA

Subject	Chronological Age	Intelligence Quotient	Grade Placement	Reading Level	School
1	12-3	87	6.9	3.6	HMS
2*	11-10	87	5.9	4.1	HMS
3	11-5	80	5.9	2.9	HMS
4	11-8	114	5.9	3.5	WLC
5	12-6	92	5.9	3.0	WLC
6	10-6	89	5.9	2.3	WLC
7	11-7	88	5.9	2.3	WLC
8	12-11	89	6.9	2.4	WJH
9	11-8	97	6.9	3.1	WJH
10	12-0	89	6.9	3.2	WJH
11	12-2	97	6.9	3.4	WJH
12	11-6	101	6.9	3.9	WMS
13	11-6	87	6.9	4.4	WMS
14	11-3	94	5.9	2.9	WMS
15	11-6	91	5.9	3.7	WMS
Mean	11-9	92.13		3.25	
Range	10-6 to 12-11	80 to 114		2.3 to 4.4	

WLC = Waverly Learning Center
WJH = Waverly Junior High
HMS = Howell Middle School
WMS = Webberville Middle School

TABLE IC

GROUP III PUPIL IDENTIFICATION DATA DISTRIBUTION

Subject	Chronological Age	Intelligence Quotient	Grade Placement	Reading Level	School
1*	11-1	104	5.9	4.3*	HMS
2	12-9	83	5.9	3.6	HMS
3	11-10	95	5.9	3.4	HMS
4	13-1	89	6.9	3.5	WLC
5	11-1	87	5.9	3.5	WLC
6	11-8	86	5.9	2.0	WLC
7	12-1	87	5.9	2.0	WJH
8	13-6	105	6.9	3.2	WJH
9	11-9	82	6.9	3.4	WJH
10	11-11	89	6.9	3.8	WMS
11	11-8	98	6.9	3.8	WMS
12	11-6	86	5.9	2.9	WMS
13	11-5	87	5.9	2.6	WMS
14	12-5	94	5.9	2.6	WMS
Mean	11-11	90.86		3.19	
Range	11-1 to 13-6	82 to 105		2.0 to 4.3	

WLC = Waverly Learning Center
WJH = Waverly Junior High
HMS - Howell Middle School
WMS - Webberville Middle School

TABLE ID

GROUP IV PUPIL IDENTIFICATION DATA DISTRIBUTION

Subject	Chronological Age	Intelligence Quotient	Grade Placement	Reading Level	School
1	11-4	89	5.9	3.7	HMS
2	11-0	97	5.9	3.2	HMS
3	11-6	102	5.9	2.4	HMS
4	11-2	98	5.9	3.5	WLC
5	10-9	90	5.9	2.0	WLC
6	11-5	90	5.9	2.5	WLC
7	13-0	106	6.9	2.5	WJH
8	12-10	80	6.9	3.2	WJH
9	13-7	98	6.9	3.6	WJH
10	12-2	85	6.9	4.2	WJH
11	12-3	99	6.9	3.8	WMS
12	11-3	92	5.9	3.0	WMS
13	11-6	85	6.9	2.7	WMS
14	11-8	90	6.9	3.0	WMS
Mean	11-10	92.93		3.09	
Range	10-9 to 13-7	80 to 106		2.0 to 4.2	

WLC = Waverly Learning Center
WJH = Waverly Junior High
HMS = Howell Middle School
WMS = Webberville Middle School

TABLE II

SUMMARY OF PUPIL IDENTIFICATION DATA FOR ALL TREATMENT GROUPS

	Chronological Age	Intelligence Quotient	Reading Level	Grade Placement
Mean	11.9	92.6	3.1	6.4
Range	10.1 to 13.6	80 to 114	1.8 to 4.4	5.9 to 6.9

Test Description

Two standardized tests were used with this study. The Sequential Tests of Educational Progress (STEP) Listening[1] test, Level 4, and two subtests from the Detroit Test of Learning Abilities (DTLA).[2] The STEP Listening tests, Form 4A and 4B, were chosen for use with this study because: (a) both forms are equivalent, (b) they have been standardized for grades four, five, and six, and (c) the "Listening" passages are reported to be typical of the things that might actually be spoken to students in school situations. Each test form has 13 passages of various types of material followed by multiple choice questions. The content areas of the material are as follows: (1) Directions and Simple Explanation, (2) Exposition, (3) Narration (both simple and figurative), (4) Argument and Persuasion, and (5) Aesthetic material (both poetry and prose). Passages vary in length and the reading time for the selections ranges from 30 seconds to 3 minutes and 40 seconds. A professional male

broadcaster recorded both Form 4A and 4B general directions, passages, the comprehension questions and multiple choice answers. The listening tests were presented in recorded form through earphones with each pupil.

Tests of auditory and visual memory were administered:

1. to insure that there was sufficient auditory memory ability to respond to the comprehension test items on the STEP,
2. to permit a comparison of auditory and visual memory and correlations with comprehension test scores.

A minimum score of recall of five items (visual and auditory) was required of each subject to be included in the study.

The Detroit Tests of Learning Aptitude subtests; "Auditory Attention Span for Unrelated Words," and the "Visual Attention Span for Objects" were administered to each subject. Test 6, "Auditory Attention Span for Unrelated Words" consists of two sets of unrelated, one-syllable words. Each set contains seven groups of words, the groups increasing in number of words from two to eight. The words were read aloud to the subject at the rate of one word per second and the subject was then asked to repeat the words. Total scores for the number of words repeated to the examiner were collected for each pupil. Test 9, "Visual Attention Span for Objects" consists of seven sets of pictures of common objects increasing in number from two to eight. Each card was exposed for one second

for each picture on it and then removed to have the subject recall what pictures were on the card.

Audio Equipment and Material

An Ampex Recorder/Reproducer,[3] Model AG 600 B, was used to make the master magnetic tape recording at 7 1/2 inches per second (ips) for the STEP Listening tests, Form 4A and 4B. Copies of the master reel were made to make the "voice cue" tapes of 4A and 4B. This required cutting out the original male voice recording of the major points and splicing in the female voice recording of major points. Cassette tapes were made from these reel to reel tapes with a TELEX Reel to Cassette Duplicating System, Model 300.[4] Three sets of the STEP Listening tests, Form 4A and Form 4B, were made for each of the three treatments in this study. Separate sets of Form 4A and 4B were made of: the "voice cue" treatment, the "pause cue" treatment, and the "no cue" treatment.

A Montage Audiomate Cassette Recorder/Producer, Model 590[5] was used to record the "pause cue" inaudible signal to highlight major points within the recorded passages of the STEP Listening tests, Form 4A and 4B. The signal was placed before major points, related to comprehension questions, in the passages of the STEP tests. A stop signal was also placed at the end of the four multiple-choices for each comprehension question at the end of the passages. This recorder utilizes a 150 Hz pulse signal

that is recorded on the cassette tape to activate a shut off switch on the Audiomate 590. The "pause cue" tapes of STEP 4A and 4B were used with the Audiomate 590 and a "button box" accessory for this experiment. Subjects could restart the tape player again by pushing the button on this accessory when the tape stopped. The "button box" was developed by staff members of the Great Lakes Regional SEIMC of Michigan State University, East Lansing, Michigan. This accessory gave a more accessible restart button than found on the original Audiomate 590 equipment. A headphone jack on the "button box" enabled the examiner to plug in a listening post to accommodate two sets of headphones. The subjects used headphones for all the STEP tests and the examiner used the second set to monitor the experiment. Volume levels were set to the subjects individual preference level by asking or directing each subject to adjust the level to his satisfaction. Subjects exposed to the "Pause Cue" treatment were told in the initial directions, when and why the recorder would stop, and how they can restart the recorder. (See Directions, Appendix)

The "voice cue" highlighting treatment utilized a male voice tape recorded presentation except that the major points within the passages were spoken by a woman. These major point recordings of sentences and/or phrases were spliced into a copy of the master tapes of the STEP Listening tests, Forms 4A and 4B, to replace the original sentences or phrases recorded by the male professional

broadcaster. A third copy of cassette tapes was made of the STEP tests for the "no cue" treatment trials.

All comprehension questions and the four multiple choice answers that followed the recorded passages of all treatments had pulse signals recorded at the end of each question and the four choices. This enabled the subjects to have time to make their choice and record it on the answer sheet. Following the subjects response to each question, the examiner then reactivated the tape presenting the subsequent questions.

The subjects used headphone, AKG Model k 180, to control for varied acoustical properties of the classrooms used and any distractions inside or outside of the testing sites. A listening post with additional headphone jack outlets was used with all trials and experiments to permit the experimenter to monitor the tests.

Pilot Study

A pilot study was conducted by the examiner to test various types of highlighting procedures to cue or aid the listener. Eighteen subjects in the fifth and sixth grades listened to five sample passages from the STEP Listening Tests Forms 4A and 4B. Each of the five passages was recorded by a male broadcaster and four specific high-lighting procedures, "voice cue", "pause cue", "tone cue", and "repeat cue", were used along with a fifth sample

that used "no cue". The techniques or materials used to highlight recorded material were as follows:

1. "voice cue" - a woman's voice was used to indicate major points within the passage read by the male broadcaster.
2. "pause cue" - the Audiomate 590 was used along with the "button box" to stop the recording at the beginning of major points with the passages. Subjects were instructed to restart the recorder by pushing the "button box" switch to restart.
3. "tone cue" - a musical beep was recorded before major points to cue the listener.
4. "repeat cue" - a Repeatcorder was used that enabled the subject to replay any 15 seconds prior to the point when the repeat button was depressed. Subjects could select any number of points to replay.

The fifth passage was played with "no cues" to indicate major points.

Each of the eighteen subjects listened to the five different passages and answered the comprehension questions that followed each passage. Pupils listened to the recorded passages using earphones.

Percentage scores for the number of questions answered correctly were compared for each of the five recorded passages. Subjects were asked which procedure they preferred to assist them in listening to recorded material. Pause cue was selected by eleven of the eighteen subjects as the most preferred method and seven stated they liked the voice cue technique. The highest percentage of correct answers to the comprehension questions favored the "pause cue and voice cue" procedures.

The subjects rejected the tone cue beep on the basis that it was annoying and came too fast for them to get ready. Although they liked the repeat recorder, they indicated that they were not always sure of when to use the repeat function of the machine. Subjects reported that they liked the idea of the pause, because it permitted them to get ready and it gave them something to do when listening. The pupils who preferred the voice cue technique over the other cue techniques reported that they liked the continuous flow (not interrupted) of information and felt that it was more direct in pointing out the major points within the passages.

On the basis of this pilot study the examiner chose to use the "pause cue" and the "voice cue" techniques to examine their effects on the listening comprehension of children with reading and/or academic difficulties. Subjects used in the pilot study were excluded from the experimental study.

Procedure

The students were all tested initially with the two subtests from the Detroit Tests of Learning Aptitude. Students were then assigned to one of the four treatment groups.

Two specific treatments, in which the stimuli for highlighting major points in the recorded passages of the STEP Listening test was varied, were used for the study. The highlighting procedures were selected from a pilot study using various highlighting procedures to cue the learner to important phrases or sentences as an aid to improving comprehension scores. The treatment programs for this specific study were: (1) "voice cue" in which the major points to be highlighted were recorded by a female voice and spliced in place of the original male recorded tape of the STEP Listening test, (2) "pause cue" technique used an inaudible signal to stop the recorder before major points to highlight them for the learner, (3) "no cues" tape recorded passages of the STEP, Level 4 Listening Test. The multiple choice questions at the end of each selection were used to determine the listening comprehension levels of the subjects.

The following flow chart diagram shows the actual steps employed for this specific study. All subjects were referred to the examiner by teacher consultants for inclusion in the study if they met the initial requirements

Figure 1

EXPERIMENTAL PROCEDURE FLOW CHART

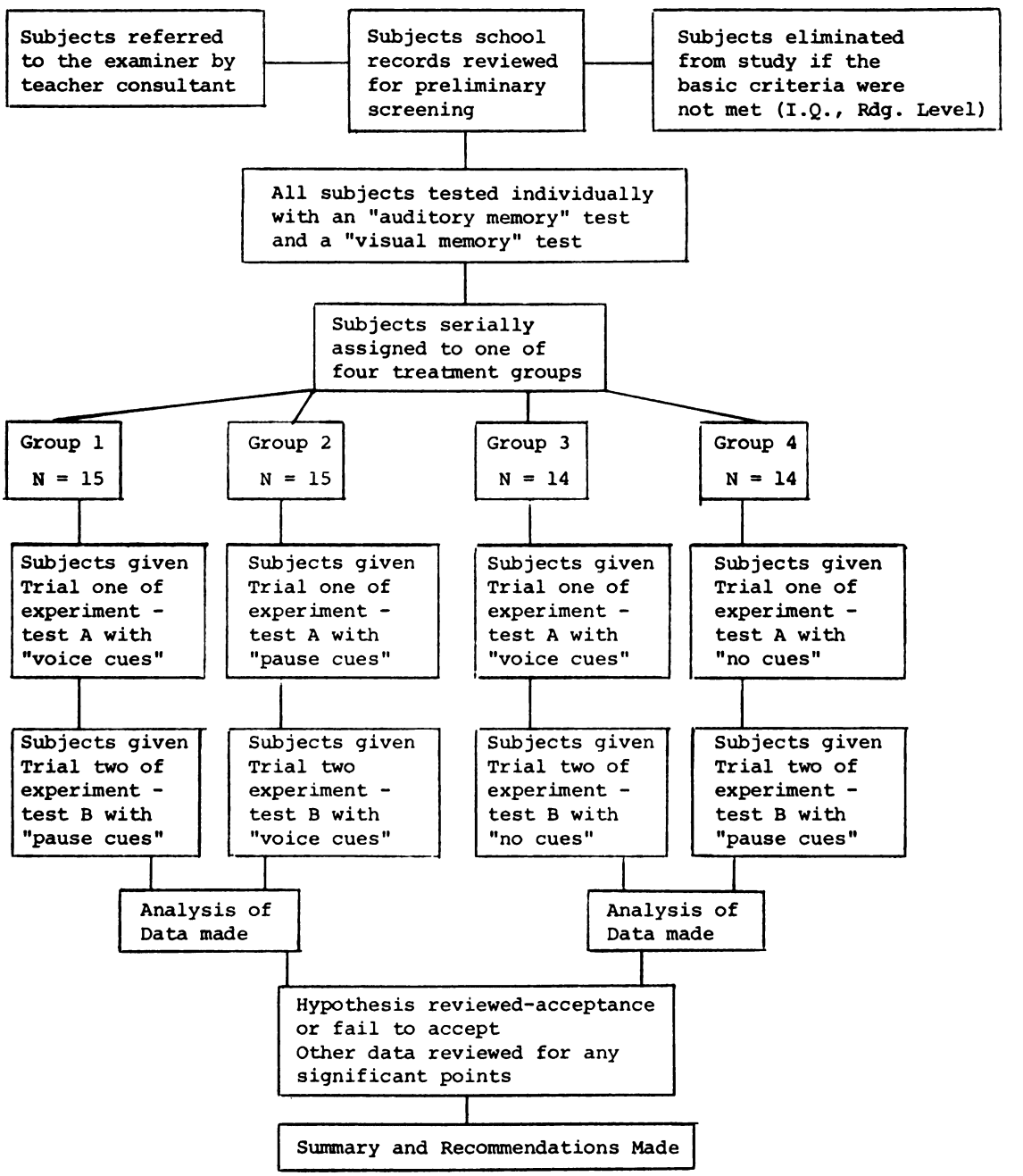

TABLE III

PRESENTATION ORDER OF EXPERIMENTAL METHODS OF RECORDED MATERIALS WITH VOICE CUES, PAUSE CUES, AND NO CUES FOR SUBJECTS AND DATA COMBINATIONS USED WITH THE TRIAL SCORES

STEP Listening Tests

Order of Presentation	Voice Cues (Verbal Highlighting)	Pause Cues (Non-verbal Highlighting)	No Cues (Normal)
Trial One	Group 1, N=15 test A	Group 2, N=15 test A	Group 4, N=14 test A
	Group 3, N=14		
Trial Two	Group 2, N=15 test B	Group 1, N=15 test B	Group 3, N=14 test B
		Group 4, N=14 test B	
Total N	N=44	N=44	N=28

of (a) average or near average intelligence, (b) reading level at least two years below expected grade level, and (c) in the fifth or sixth grade.

A cassette tape player with earphones was used to present the listening tests to the subjects. The initial instructions to the subjects were given by the experimenter. (See Appendix A for Initial Directions) Subjects used the test booklets and a separate IBM answer sheet to record their answers to the multiple-choice questions following each passage. The answer foils are printed in the test booklets, but the questions are not. There are 80 multiple-choice questions in the STEP Level 4A and 4B. The listening tests are divided into two parts and each takes approximately 45 minutes. Administration of trial one and trial two were separated in time from ten to fourteen days.

It was necessary to eliminate one subject and to replace her with another subject in group II. This was due to the strategies she employed during the second trial treatment. The subject indicated to the examiner that she found that after taking the "pause cue" treatment that she "needed to have something to do with her hands when listening." When she took the second treatment (voice cue) she used a piece of paper to doodle on at various times. No answers appeared to be recorded on this paper, but since this strategy was not available to the other subjects it was felt that the subject's scores should not be used.

A cassette tape player with earphones was used to present the listening tests to the subjects. The initial instructions to the subjects were given by the experimenter. Subjects used the test booklets and a separate IBM answer sheet to record their answers to the multiple-choice questions following each passage. The answer foils are printed in the test booklets, but the questions are not. There are 80 multiple-choice questions in the STEP Level 4A and 4B. The listening tests are divided into two parts and each takes approximately 45 minutes. Administration of trial one and trial two were separated in time from ten to fourteen days.

CHAPTER III

REFERENCES

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[3]AMPEX Operational and Maintenance Manual-Model AG 600 B. Redwood City, California: Ampex Corporation, 1969.

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CHAPTER IV

FINDINGS AND STATISTICAL ANALYSIS

Introduction

There are four areas of data to be reported in this study. The first deals with the findings of the effect that auditory highlighting strategies with recorded material has on listening comprehension scores. The second area examined deals with the differences in scores for any of the five specific types of material within the listening tests. The third area to be examined is the raw data obtained on all subjects (I.Q., Reading Level, Visual Memory, and Auditory Memory scores) for possible correlations with scores obtained on measures of listening comprehension. The fourth area of data reviewed was collected by a questionnaire for each subject on their preference and acceptance of recorded material and the strategies used in their trials.

The design of this experiment involved the comparison of highlighting techniques and additional measures for any possible correlations. The design variables are diagrammed in Figure 2.

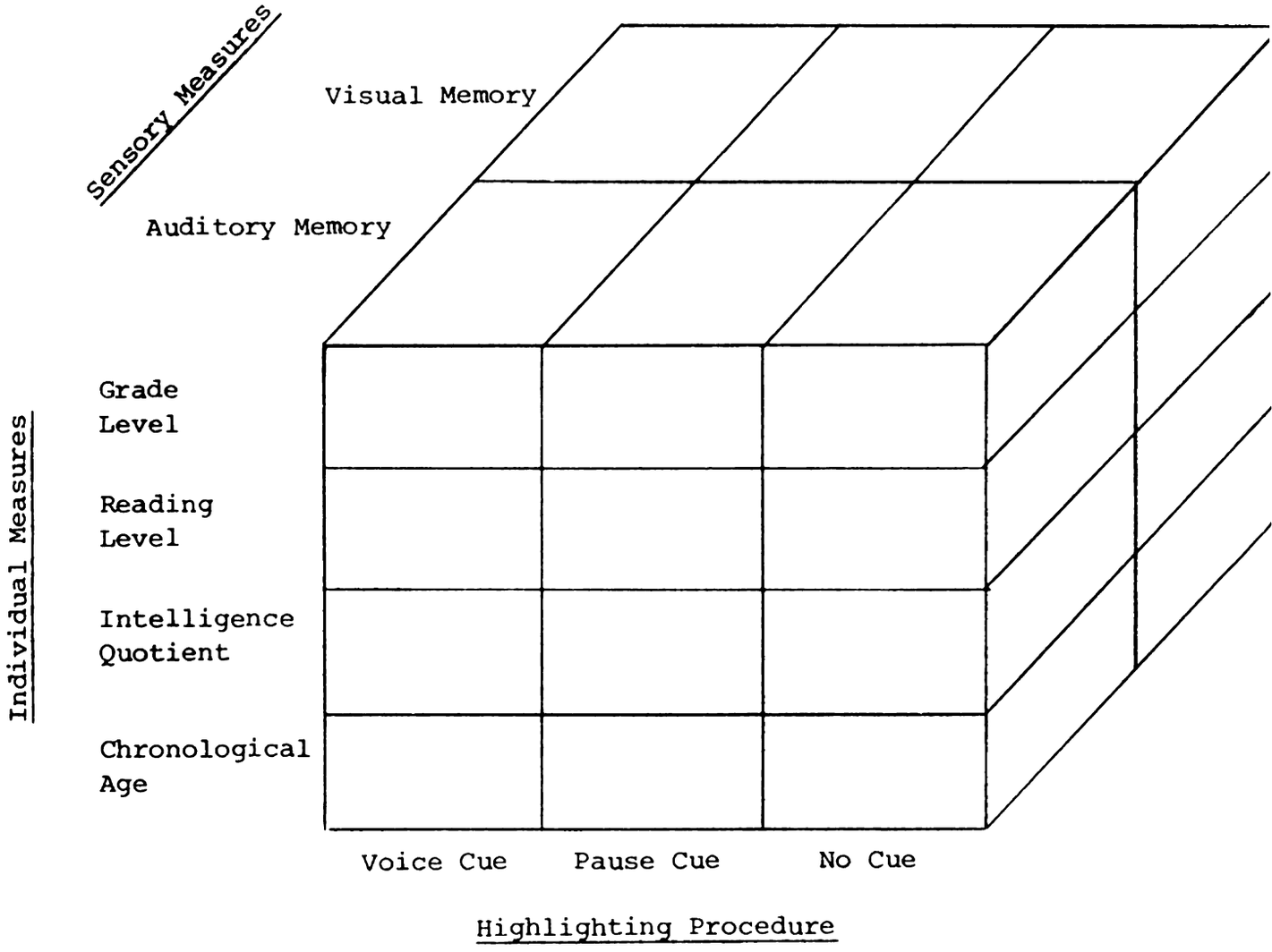

Figure 2. Experimental Design Variables

Analysis of Data

All data for the four treatment groups are summarized with the means and standard deviations for each treatment in Tables IV, V, VI. The differences in the means between the "pause cue" and "voice cue" treatments are very negligible with groups 1 and 2 (Table IV). The differences in the means between the highlighted ("voice/pause cue") treatments and the non-highlighted ("no cue") treatments was small. Group 3's difference in means was 1.93 points in favor of the "voice cue" treatment over the "no cue" treatment (Table V). The difference in means was 4.07 in favor of the "pause cue" treatment in Group 4 (Table VI).

TABLE IV

COMPARISON OF COMPREHENSION SCORES FOR GROUPS 1 and 2 WITH PAUSE CUE AND VOICE CUE TREATMENT TRIALS

Group/Time	Number	Mean	S.D.	Range
Group 1				
Trial 1 (voice cue)	15	45.20	12.50	25 to 69
Trial 2 (pause cue)	15	45.13	13.47	23 to 63
Group 2				
Trial 1 (pause cue)	15	45.93	9.45	17 to 62
Trial 2 (voice cue)	15	44.73	14.15	25 to 60

TABLE V

COMPARISON OF COMPREHENSION SCORES FOR GROUP 3

WITH VOICE CUE AND NO CUE TREATMENTS

Group/Time	Number	Mean	S.D.	Range
Group 3				
Trial 1 (voice cue)	14	44.86	10.35	26 to 62
Trial 2 (no cue)	14	42.93	11.63	17 to 62

TABLE VI

COMPARISON OF COMPREHENSION SCORES FOR GROUP 4

WITH PAUSE CUE AND NO CUE TREATMENTS

Group/Time	Number	Mean	S.D.	Range
Group 4				
Trial 1 (no cue)	14	41.00	11.04	19 to 60
Trial 2 (pause cue)	14	45.07	9.62	23 to 62

A "repeated measures design" of analysis of variance was used to determine if a significant difference did exist between the highlighted treatments or with the non-highlighted treatments. This statistical model is appropriate for studies that have observations of persons

that were made several times instead of once. (Glass & Stanley, 1970)[1] The ANOVA Tables (Table VIIA-D) that follow presents the data analysis findings.

The F ratio associated with the highlighted and non-highlighted treatments was found not statistically significant at the .05 level. This indicated that comprehension was not significantly affected by the highlighting cues. Therefore, there is no reason to reject the following null hypotheses:

Hypothesis 1. There will be no significant difference ($p<.05$) between the means of total comprehension scores with the "voice cue" treatment and the "pause cue" treatment.

Hypothesis 2. There will be no significant difference ($p<.05$) between the means of total comprehension scores with the "voice cue" and the "no cue" treatment.

Hypothesis 3. There will be no significant difference ($p<.05$) between the means of total comprehension scores with the "pause cue" treatment and the "no cue" treatment.

TABLE VII A

ANOVA TABLE (REPEATED MEASURE) - GROUP I

VOICE CUE - PAUSE CUE

Source	df	MS	F	P
Repeated Measure Score	1	.0333	.0026	.9603
Error	14			

TABLE VII B

ANOVA TABLE (REPEATED MEASURE) - GROUP II

PAUSE CUE - VOICE CUE

Source	df	MS	F	P
Repeated Measure Score	1	10.7967	.3072	.5882
Error	14			

TABLE VII C

ANOVA TABLE (REPEATED MEASURE) - GROUP III

VOICE CUE - NO CUE

Source	df	MS	F	P
Repeated Measure Score	1	26.0279	.8758	.3665
Error	13			

TABLE VII D

ANOVA TABLE (REPEATED MEASURE) - GROUP IV

NO CUE - PAUSE CUE

Source	df	MS	F	P
Repeated Measure Score	1	116.0007	1.8612	.1957
Error	13			

Although no significant differences were found between total comprehension scores under the various treatment conditions, further analysis of the highlighting effect was made with the subtest scores of the comprehension measures. To test Hypotheses 4 and 5, a multivariate analysis of variance (MANOVA) procedure was used. This procedure is prescribed for analysis of data with experiments having two or more treatment variables each having two or more criterion measures by which to measure the outcome or effects of the experiment. (Tatsuoka, 1971)[2]

Hypotheses 4 and 5 were:

4 - There will be no significant difference ($p<.05$) between the means of subtest comprehension scores on all types of materials with the "voice cue" treatment and the "pause cue" treatment with groups 1 and 2.

5 - There will be no significant difference ($p<.05$) between the means of subtest comprehension scores on

all types of materials with the "cued" treatment and the "no cue" treatments used with groups 3 and 4.

The comprehension raw scores for the STEP Listening Tests were subdivided into the five types of material as listed in the STEP Teacher's Guide. The five types of material are: 1) Directions, 2) Exposition, 3) Narration, 4) Argument, Persuasion, and 5) Aesthetic material.

Tables VIII A, B, C and D present the statistical analysis of this data (MANOVA Tables) for all four treatment groups. Although there were no significant differences between treatments when total comprehension scores were used, there were some significant differences between subtest scores under different cued conditions. These differences were not consistent between either subject groups or subtests. Consequently, the results of these analyses did not offer consistent evidence for rejection of null hypotheses 4 and 5. The lack of consistency on differences with individual subtests makes interpretation very difficult. It suggests that the type of material, as in the STEP tests, is not consistently affected by the cued and non-cued techniques used in this study.

TABLE VIII A

MULTIVARIATE ANALYSIS OF VARIANCE FOR SUBTESTS SCORES ACHIEVED ON STEP LISTENING TEST BY GROUP I - VOICE CUE - PAUSE CUE TREATMENTS

MANOVA Table

Source	df	MS	F	P
Subtest 1 (Directions)	1	1612.85	1.372	.261
Subtest 2 (Exposition)	1	425.50	.416	.530
Subtest 3 (Narration)	1	24.29	6.517	.023*
Subtest 4 (Argument)	1	58.78	.680	.424
Subtest 5 (Aesthetic)	1	67.48	.092	.766
Error	14			

*Significant at .05 level or below

TABLE VIII B

MULTIVARIATE ANALYSIS OF VARIANCE FOR SUBTESTS SCORES ACHIEVED ON STEP LISTENING TEST BY GROUP II - PAUSE CUE - VOICE CUE TREATMENTS

MANOVA Table

Source	df	MS	F	P
Subtest 1 (Directions)	1	333.23	.321	.580
Subtest 2 (Exposition)	1	589.46	.527	.480
Subtest 3 (Narration)	1	1.20	.268	.613
Subtest 4 (Argument)	1	246.46	6.748	.021*
Subtest 5 (Aesthetic)	1	2304.94	1.216	.289
Error	14			

*Signifcant at .05 level or below

TABLE VIII C

MULTIVARIATE ANALYSIS OF VARIANCE FOR SUBTESTS SCORES ACHIEVED ON STEP LISTENING TEST BY GROUP III - VOICE CUE - NO CUE TREATMENTS

MANOVA Table

Source	df	MS	F	P
Subtest 1 (Directions)	1	11763.446	7.239	.019*
Subtest 2 (Exposition)	1	.036	.000	.995
Subtest 3 (Narration)	1	14.281	2.519	.137
Subtest 4 (Argument)	1	146.242	2.337	.150
Subtest 5 (Aesthetic)	1	349.930	.402	.537
Error	13			

*Significant at .05 level or below

TABLE VIII D

MULTIVARIATE ANALYSIS OF VARIANCE FOR SUBTESTS SCORES ACHIEVED ON STEP LISTENING TEST BY GROUP IV - NO CUE - PAUSE CUE TREATMENTS

MANOVA Table

Source	df	MS	F	P
Subtest 1 (Directions)	1	12176.893	6.803	.022*
Subtest 2 (Exposition)	1	7070.186	9.257	.010*
Subtest 3 (Narration)	1	.143	.015	.905
Subtest 4 (Argument)	1	9.140	.106	.750
Subtest 5 (Aesthetic)	1	5598.880	3.265	.094
Error	13			

*Significant at .05 level or below

Hypotheses 6 and 7 dealt with relationships between scores obtained on the "auditory memory" and "visual memory" measures and the obtained listening comprehension scores for the four groups. The hypotheses restated were as follows:

Hypotheses Related to Sensory Memory Test Scores and Listening Comprehension

6 - There will be no relationship between scores achieved on a test of "auditory memory" and comprehension scores achieved under any treatment condition.

7 - There will be no significant relationship between the scores achieved on a "visual memory" test and comprehension scores achieved under any treatment condition.

Tables IX A, B, C, and D presents coefficients of correlation for listening comprehension scores and the visual and auditory memory measures for Groups I, II, III and IV.

TABLE IX A

CORRELATION MATRIX FOR LISTENING COMPREHENSION SCORES AND VISUAL AND AUDITORY MEMORY SCORES FOR GROUP 1 - VOICE CUE & PAUSE CUE

	Auditory Memory Score (DTLA #6)	Visual Memory Score (DTLA #9)
Auditory Memory Score	1.000	
Visual Memory Score	.582*	1.000
STEP 4A (Voice Cue)	.347	.285
STEP 4B (Pause Cue)	.015	.153

N = 15 df = 13

*Significantly different from zero at the .05 level if >.514.

TABLE IX B

CORRELATION MATRIX FOR LISTENING COMPREHENSION SCORES AND VISUAL AND AUDITORY MEMORY SCORES FOR GROUP 2 - PAUSE CUE & VOICE CUE

	Auditory Memory Score (DTLA #6)	Visual Memory Score (DTLA #9)
Auditory Memory Score	1.000	
Visual Memory Score	.425	1.000
STEP 4A (Pause Cue)	.274	.415
STEP 4B (Voice Cue)	.269	.202

N = 14 df = 12

*Significantly different from zero at the .05 level if >.514.

TABLE IX C

CORRELATION MATRIX FOR LISTENING COMPREHENSION SCORES AND VISUAL AND AUDITORY MEMORY SCORES FOR GROUP 3 - VOICE CUE AND NO CUE

	Auditory Memory Score (DTLA #6)	Visual Memory Score (DTLA #9)
Auditory Memory Score	1.000	
Visual Memory Score	.423	1.000
STEP 4A (Voice Cue)	.298	-.099
STEP 4B (No Cue)	.581*	.289

N = 14 df = 12

*Significantly different from zero at the .05 level if >.532.

TABLE IX D

CORRELATION MATRIX FOR LISTENING COMPREHENSION SCORES AND VISUAL AND AUDITORY MEMORY SCORES FOR GROUP 4 - NO CUE AND PAUSE CUE

	Auditory Memory Score (DTLA #6)	Visual Memory Score (DTLA #9)
Auditory Memory Score	1.000	
Visual Memory Score	.162	1.000
STEP 4A (No Cue)	.208	-.315
STEP 4B (Pause Cue)	.183	.240

N = 14 df = 12

*Significantly different from zero at the .05 level if >.532.

No significant relationship was found to exist with the "visual or auditory memory" measures and the scores achieved with the "cued" listening comprehension scores. The only significant correlation found was with Group 3 subjects' scores on the "no cue" trial and scores achieved on the "auditory memory" measure. There was no statistically significant difference found when total score measures were used in determining the coefficients of correlations.

Visual inspection of the ranked scores obtained on the auditory and visual memory measures with the difference scores between the two trials on the listening comprehension treatments did suggest several relationships (See Tables X A, B, C, and D). Subjects whose scores favored the "voice cue" trial in Groups I and II were for the most part in the top half of the ranked "auditory memory" measure. For the highest 15 (re: auditory memory) 11 of them showed a higher score on the "voice cue" trial than "pause cue" trial. For the lowest 15 (re: auditory memory) 4 of them showed a higher score on the "voice cue" trial.

TABLE X A

COMPARISON OF STEP LISTENING TEST SCORES BETWEEN VOICE CUE AND PAUSE CUE TREATMENTS RANKED ACCORDING TO RAW SCORES ACHIEVED ON THE DTLA SUBTEST # 6 - "AUDITORY MEMORY FOR UNRELATED WORDS" FOR GROUPS 1 AND 2 COMBINED

Subject/Group	Auditory Memory Score	STEP Score "Voice Cue"	STEP Score "Pause Cue"	Difference Score
1/1	59	55	54	v 1
2/1	52	69	63	v 6
3/2	51	31	37	6 p
4/1	49	50	47	v 3
5/2	48	55	58	e p
6/2	47	58	51	v 7
7/1	47	40	35	v 5
8/1	47	35	25	v 10
9/2	46	41	49	8 p
10/2	44	58	49	v 9
11/1	44	53	52	v 1
12/1	43	58	56	v 2
13/1	43	25	23	v 2
14/2	43	53	51	v 2
15/1	42	37	38	1 p
16/2	42	38	49	9 p
17/1	42	48	51	3 p
18/2	42	61	57	v 4
19/1	41	53	59	6 p
20/1	41	31	39	8 p
21/2	41	39	43	4 p
22/1	41	48	56	8 p
23/2	40	46	37	v 9
24/2	38	17	25	8 p
25/2	38	62	60	v 2
26/2	37	20	38	18 p
27/2	35	41	45	4 p
28/1	35	26	26	0
29/1	33	50	53	3 p
30/2	32	51	40	v 11

"v" indicates difference was in favor of "voice cue" treatment

"p" indicates difference was in favor of "pause cue" treatment

TABLE X B

COMPARISON OF STEP LISTENING TEST SCORE DIFFERENCES BETWEEN VOICE AND PAUSE CUE TREATMENTS AND RANKED RAW SCORES ACHIEVED ON THE DTLA SUBTEST #6 - "AUDITORY MEMORY FOR UNRELATED WORDS" FOR GROUP I

Subject	Auditory Memory Score	STEP Score "Voice Cue"	STEP Score "Pause Cue"	Difference Score
1	59	55	54	v 1 x
2	52	69	63	v 6 x
3	49	50	47	v 3 x
4	47	40	35	v 5 x
5	47	35	25	v 10 x
6	44	53	52	v 1 x
7	43	58	56	v 2
8	43	25	23	v 2
9	42	37	38	1 p x
10	42	48	51	3 p x
11	41	53	59	6 p x
12	41	31	39	8 p x
13	41	48	56	8 p x
14	35	26	26	0
15	33	50	53	3 p x
	$\bar{x}$ = 43.93	$\bar{x}$ = 45.20	$\bar{x}$ = 45.13	$v\bar{x}$ = 3.75 $p\bar{x}$ = 4.83

x indicates subject preferred treatment in which highest score was obtained

"v" indicates difference was in favor of "voice cue" treatment

"p" indicates difference was in favor of "pause cue" treatment

TABLE X C

COMPARISON OF STEP LISTENING TEST SCORE DIFFERENCES BETWEEN VOICE AND PAUSE CUE TREATMENTS AND RANKED RAW SCORES ACHIEVED ON THE DTLA SUBTEST #6 - "AUDITORY MEMORY FOR UNRELATED WORDS" FOR GROUP II

Subjects	Auditory Memory Score	STEP Score "Pause Cue"	STEP Score "Voice Cue"	Difference Score
1	51	31	37	6 p x
2	48	55	58	3 p x
3	47	58	51	v 7
4	46	41	49	8 p x
5	44	58	49	v 9
6	43	53	51	v 2
7	42	38	49	9 p x
8	42	61	57	v 4
9	41	39	43	4 p x
10	40	46	37	v 9
11	38	17	25	8 p x
12	38	62	60	v 2
13	37	20	38	18 p x
14	35	41	45	4 p x
15	32	51	40	v 11
	$\bar{x}$ = 41.60	$\bar{x}$ = 45.93	$\bar{x}$ = 44.73	$v\bar{x}$ = 6.29 $p\bar{x}$ = 7.50

x indicates subject preferred treatment in which highest score was obtained

"v" indicates difference was in favor of "voice cue" treatment

"p" indicates difference was in favor of "pause cue" treatment

TABLE X D

COMPARISON OF STEP LISTENING TEST SCORES BETWEEN VOICE CUE AND NO CUE TREATMENTS RANKED ACCORDING TO RAW SCORES ACHIEVED ON THE DTLA SUBTEST #6 "AUDITORY MEMORY FOR UNRELATED WORDS" FOR GROUP 3

Subject	Auditory Memory Raw Score	STEP Score "Voice Cue"	STEP Score "No Cue"	Difference Score
1	58	41	55	v 4 n
2	55	49	42	v 7 x
3	55	37	45	8 n
4	55	28	34	6 n
5	49	42	34	v 8 x
6	48	62	62	0
7	46	43	41	v 2 x
8	45	47	40	v 7 x
9	43	50	52	2 n
10	42	61	50	v 11
11	42	50	47	v 3
12	41	42	30	v 12
13	36	50	52	2 n
14	33	26	17	v 9
	$\bar{x}$ = 46.29	$\bar{x}$ = 44.86	$\bar{x}$ = 42.93	$v\bar{x}$ = 7.44 $n\bar{x}$ = 6.00

x subject indicated this treatment helped them in listening

"v" indicates difference was in favor of voice cue treatment

"n" indicates difference was in favor of "no cue" treatment

TABLE X E

COMPARISON OF STEP LISTENING TEST SCORES BETWEEN NO CUE AND PAUSE CUE TREATMENTS RANKED ACCORDING TO RAW SCORES ACHIEVED ON THE DTLA SUBTEST #6 - "AUDITORY MEMORY FOR UNRELATED WORDS" FOR GROUP 4

Subject	Auditory Memory Raw Score	STEP Score "No Cue"	STEP Score "Pause Cue"	Difference Score
1	54	19	48	29 p x
2	52	51	52	1 p
3	47	42	49	7 p
4	45	60	51	n 9
5	45	30	34	4 p x
6	45	35	62	27 p x
7	42	44	41	n 3
8	42	41	43	2 p x
9	40	26	23	n 3
10	40	37	36	n 1
11	39	46	42	n 4
12	36	54	49	n 5
13	35	42	48	6 p x
14	35	47	53	6 p x
	$\bar{x}$ = 42.64	$\bar{x}$ = 41.00	$\bar{x}$ = 45.07	$p\bar{x}$ = 10.25 $n\bar{x}$ = 4.50

x subject indicated this treatment helped them in listening

"n" indicates difference was in favor of "no cue" treatment

"p" indicates difference was in favor of pause cue treatment

TABLE XI A

COMPARISON OF STEP LISTENING TEST SCORES BETWEEN VOICE CUE AND PAUSE CUE TREATMENTS RANKED ACCORDING TO RAW SCORES ACHIEVED ON THE DTLA SUBTEST #9 - "VISUAL ATTENTION SPAN FOR OBJECTS" FOR GROUPS 1 and 2 COMBINED

Subject	Visual Memory Score	STEP Score "Voice Cue"	STEP Score "Pause Cue"	Difference Score
1	54	55	54	v 1
2	52	58	51	v 7
3	52	55	58	3 p
4	50	41	45	4 p
5	48	40	35	v 5
6	48	53	52	v 1
7	47	38	49	9 p
8	47	25	23	v 2
9	47	31	37	6 p
10	46	50	47	v 3
11	46	41	49	8 p
12	46	37	38	1 p
13	46	61	57	v 4
14	45	69	63	v 6
15	45	20	38	18 p
16	44	53	59	6 p
17	44	58	49	v 9
18	43	39	43	4 p
19	43	58	56	v 2
20	43	50	53	3 p
21	43	26	26	0
22	42	48	51	3 p
23	41	48	56	8 p
24	41	62	60	v 2
25	40	31	39	8 p
26	40	17	25	8 p
27	39	46	37	v 9
28	37	53	51	v 2
29	32	35	25	v 10
30	30	51	40	v 11

"v" indicates difference was in favor of "voice cue" treatment

"p" indicates difference was in favor of "pause cue" treatment

TABLE XI B

COMPARISON OF STEP LISTENING TEST SCORE DIFFERENCES BETWEEN VOICE AND PAUSE CUE TREATMENTS AND RANKED RAW SCORES ACHIEVED ON THE DTLA SUBTEST # 9 - "VISUAL ATTENTION SPAN FOR OBJECTS" FOR GROUP I

Subject	Visual Memory Score	STEP Score "Voice Cue"	STEP Score "Pause Cue"	Difference Score
1	54	55	54	v 1 x
2	48	40	35	v 5 x
3	48	53	52	v 1 x
4	47	25	23	v 2
5	46	50	47	v 3 x
6	46	37	38	1 p x
7	45	69	63	v 6 x
8	44	53	59	6 p x
9	43	58	56	v 2
10	43	50	53	3 p x
11	43	26	26	0
12	42	48	51	3 p x
13	41	48	56	8 p x
14	40	31	39	8 p x
15	32	35	25	v 10 x
	$\bar{x}$ = 44.13	$\bar{x}$ = 45.20	$\bar{x}$ = 45.13	$v\bar{x}$ = 3.75 $p\bar{x}$ = 4.83

x indicates subject preferred treatment in which highest score was obtained

"v" indicates difference was in favor of voice cue treatment

"p" indicates difference was in favor of pause cue treatment

TABLE XI C

COMPARISON OF STEP LISTENING TEST SCORE DIFFERENCES BETWEEN VOICE AND PAUSE CUE TREATMENTS AND RANKED RAW SCORES ACHIEVED ON THE DTLA SUBTEST #9 - "VISUAL ATTENTION SPAN FOR OBJECTS" FOR GROUP 2

Subject	Visual Memory Score	STEP Score "Pause Cue"	STEP Score "Voice Cue"	Difference Score
1	52	58	51	v 7
2	52	55	58	3 p x
3	50	41	45	4 p x
4	47	38	49	9 p x
5	47	31	37	6 p x
6	46	41	49	8 p x
7	46	61	57	v 4
8	45	20	38	18 p x
9	44	58	49	v 9
10	43	39	43	4 p x
11	41	62	60	v 2
12	40	17	25	8 p x
13	39	46	37	v 9
14	37	53	51	v 2
15	30	51	40	v 11
	$\bar{x}$ = 43.93	$\bar{x}$ = 45.93	$\bar{x}$ = 44.73	$v\bar{x}$ = 6.29 $p\bar{x}$ = 7.50

x indicates subject preferred treatment in which highest score was obtained

"v" indicates highest score was with "voice cue" STEP test

"p" indicates highest score was with "pause cue" STEP test

TABLE XI D

COMPARISON OF STEP LISTENING TEST SCORES BETWEEN VOICE CUE AND NO CUE TREATMENTS RANKED ACCORDING TO RAW SCORES ACHIEVED ON THE DTLA SUBTEST #9 "VISUAL ATTENTION SPAN FOR OBJECTS" FOR GROUP 3

Subject	Visual Memory Raw Score	STEP Score "Voice Cue"	STEP Score "No Cue"	Difference Score
1	54	41	55	14 n
2	52	50	52	2 n
3	50	62	62	0
4	49	50	47	v 3
5	48	43	41	v 2 x
6	45	37	45	8 n
7	45	49	42	v 7 x
8	44	61	50	v 11
9	42	28	36	6 n
10	41	47	40	v 7 x
11	40	42	30	v 12
12	37	26	17	v 8
13	33	50	52	2 n
14	32	42	34	v 8
	$\bar{x}$ = 43.71	$\bar{x}$ = 44.86	$\bar{x}$ = 42.93	$v\bar{x}$ = 7.44 $n\bar{x}$ = 6.40

x subject indicated this treatment helped them in listening

"v" indicates difference was in favor of voice cue treatment

"n" indicates difference was in favor of "no cue" treatment

TABLE XI E

COMPARISON OF STEP LISTENING TEST SCORES BETWEEN PAUSE CUE AND NO CUE TREATMENTS RANKED ACCORDING TO RAW SCORES ACHIEVED ON THE DTLA SUBTEST #9 "VISUAL ATTENTION SPAN FOR OBJECTS" FOR GROUP 4

Subject	Visual Memory Raw Score	STEP Score "NO Cue"	STEP Score "Pause Cue"	Difference Score
1	55	44	41	n 4
2	54	46	42	n 4
3	49	51	52	1 p
4	48	41	43	2 p x
5	48	19	48	29 p x
6	46	42	48	6 p x
7	45	60	51	n 9
8	45	37	36	n 1
9	45	35	62	27 p x
10	44	54	49	n 5
11	40	30	34	4 p x
12	39	42	49	7 p
13	36	47	53	6 p x
14	33	26	23	n 3
	$\bar{x}$ = 41.21	$\bar{x}$ = 41.00	$\bar{x}$ = 45.07	$p\bar{x}$ = 10.25 $n\bar{x}$ = 4.50

x subject indicated this treatment helped them in listening

"n" indicates difference was in favor of "no cue" treatment

"p" indicates difference was in favor of pause treatment

These data suggested that a correlation did exist between measures of auditory and visual memory and the highest scores obtained with the STEP Listening Tests treatments. For the correlations reported in Table XIIA, difference scores between the two cueing conditions (Groups 1 & 2) or between the cue and no cue conditions in the case of Groups 3 & 4 were used. Positive values were assigned differences in favor of voice cue conditions for Groups 1 & 2, with negative values assigned to differences in favor of pause cue conditions. For groups 3 & 4, differences in favor of cued treatment were assigned positive values, while negative values were given to differences favoring no cue treatments. Consequently, the positive or negative sign of the resulting correlation coefficients were disregarded because they were indicative only of potential relationships, rather than direction of such relationships.

TABLE XII A

CORRELATION MATRIX FOR AUDITORY AND VISUAL MEMORY SCORES WITH LISTENING COMPREHENSION SCORE DIFFERENCES FOR GROUPS I, II, III, & IV

	Group I Difference	Group II Between STEP	Group III Scores on	Group IV Trial 1 & 2
Auditory Memory (DTLA #6)	.487**	.063	.491**	.131
Visual Memory (DTLA #9)	.700*	.363	.605*	.040

* Significantly different from zero at the .05 level

** Significantly different from zero at the .10 level

Significant correlations at the .05 level of confidence were found with the measures of visual memory (DTLA #9) and the difference scores (the difference in scores obtained with voice cue and pause cue treatments) for Groups I and II. Auditory memory scores for Groups I and III were found to correlate with the difference scores at the .10 level of confidence. When the findings for Groups I and II were combined, a significant relationship at the .01 level of confidence was found between visual memory scores and the difference scores (See Table XII B).

TABLE XII B

CORRELATION MATRIX FOR AUDITORY AND VISUAL MEMORY SCORES WITH LISTENING COMPREHENSION SCORE DIFFERENCES FOR GROUPS I & II COMBINED

	Group I Difference Between Pause Cue & Voice Cue Treatments As Measured by STEP Tests Group II
Auditory Memory (DTLA #6)	.183
Visual Memory (DTLA #9)	.817*

* Significantly different from zero at the .01 level

The significant correlations at the .05 level of confidence for visual memory scores and difference scores reported in Tables XIIA and B did offer support for the

rejection of the null hypothesis number 7. This hypothesis stated:

7 - There will be no significant relationship between the scores achieved on a "visual memory" test and comprehension scores achieved under any treatment condition.

The correlation findings for auditory memory and difference scores offered evidence to reject the null hypothesis number 6 only when the .10 level of confidence was used as shown in Table XII A. Hypothesis 6 stated:

6 - There will be no significant relationship between the scores achieved on an "auditory memory" test and comprehension scores achieved under any treatment conditions.

Tables XII C & D present the findings for the highest and lowest memory scores and the treatment (voice, pause, or no cue) under which their highest score was obtained. There is some evidence to indicate that a relationship does exist between visual and auditory memory scores and auditory highlighting treatment scores.

TABLE XII C

SUMMARY TABLE FOR RELATIONSHIPS WITH VISUAL MEMORY SCORES (HIGHEST/LOWEST) AND DIFFERENCE SCORES WITH STEP TESTS

	Group I (Voice-Pause Cue)	Group II (Pause-Voice Cue)	Group III (Voice-No Cue)	Group IV (No Cue-Pause)	
Highest Auditory Memory Score With Difference Score in Favor of Voice Cue Treatment	8	4	3		15/44
Highest Auditory Memory Score With Difference Score in Favor of Pause Cue Treatment	0	4		5	9/44
Highest Auditory Memory Score With Difference Score in Favor of No Cue Treatment			3	2	5/28
Lowest Auditory Memory Score With Difference Score in Favor of Voice Cue Treatment	0	3	5		8/28
Lowest Auditory Memory Score With Difference Score in Favor of Pause Cue Treatment	6	4		3	13/44
Lowest Auditory Memory Score With Difference Score in Favor of No Cue Treatment			2	4	6/28
	14*	15	13*	14	

*One subject had no difference between the two treatment trials

TABLE XII D

SUMMARY TABLE FOR RELATIONSHIPS WITH AUDITORY MEMORY SCORES (HIGHEST/LOWEST) AND DIFFERENCE SCORES WITH STEP TESTS

	Group I (Voice-Pause Cue)	Group II (Pause-Voice Cue)	Group III (Voice-No Cue)	Group IV (No Cue-Pause)	
Highest Visual Memory Scores With Difference Score in Favor of Voice Cue Treatment	6	2	3		11/44
Highest Visual Memory Scores With Difference Score in Favor of Pause Cue Treatment	2	6		4	12/44
Highest Visual Memory Scores With Difference Score in Favor of No Cue Treatment			3	3	6/28
Lowest Visual Memory Scores With Difference Score in Favor of Voice Cue Treatment	2	5	5		12/28
Lowest Visual Memory Scores With Difference Score in Favor of Pause Cue Treatment	4	2		4	10/44
Lowest Visual Memory Scores With Difference Score in Favor of No Cue Treatment			2	3	5/28
	N = 14/15*	N = 15	N = 13/14*	N = 14	

*One subject had no difference between the two treatment trials

Table XIII presents the simple correlations between the raw data (I.Q., Grade Placement, Reading Level, Visual Memory Score, and STEP Comprehension Scores on Trials 1 and 2) for all subjects. The strength of the relationships can be described as "low correlations: definite but small relationships" (Guilford, 1956)[3] for the majority of the simple correlations. The correlations between .40 and .70 are considered as "Moderate correlations; substantial relationship." The correlation between the raw scores achieved on the STEP 4A (Trial 1) and the STEP 4B (Trial 2) was the only measures found with a "High correlation; marked relationship."

TABLE XIII

SUMMARY OF SIMPLE CORRELATIONS OF VARIABLES
FOR SUBJECTS (N = 58) IN EXPERIMENTAL STUDY

	I.Q.	Grade Placement	Reading Level	Visual Memory	Auditory Memory	STEP 4A Raw Score
I.Q.						
Grade Placement	.162					
Reading Level	.178	.428*				
Visual Memory (DTLA Raw Score)	.138	.268**	.341*			
Auditory Memory (DTLA Raw Score)	.215	.113	.369(	.370*		
STEP 4A (Trial 1 - Total Score)	.293*	.387*	.493*	.267**	.077	
STEP 4B (Trial 2 - Total Score)	.336*	.210	.580*	.249**	.192	.732*

*Significant at .05 level >.273

**Significant at .10 level >.231

Questionnaire Findings

A questionnaire (Appendix B) was administered to all subjects when they had completed the two experimental treatments with the STEP Listening Tests. The questions all dealt with the subject's acceptance and/or preference of tape recorded material and procedures used in this study. Two forms of Question #1 were used since groups III & IV did not have two specific types of highlighting to compare. All subjects were urged to give their own opinions and feelings about the use of recorded materials as a means of instruction in the classroom. A summary of the findings for each specific question follows:

Question #1 - "Which method of highlighting clues or major points did you prefer and find most helpful? Why?"

(Used with subjects in Groups 1 & 2)

Twenty-four of the thirty subjects chose the "pause cue" method, with the remaining six choosing the "voice cue" method. The subjects individual scores were examined to determine if their scores were higher in the stated preferred method. Fourteen of the twenty-four (67%) did achieve a higher score with the "pause cue" method of highlighting. Their scores were from 1 to 18 points higher. All six subjects who elected the "voice cue" method had scores from 2 to 10 points higher with this method (See Table XIV A).

(Alternative Questions Used With Groups 3 & 4)

Question #1 - "Do you think that ("voice cue"/"pause cue") was helpful for you when listening to the taped material? Why?"

A total of twenty of the twenty-eight subjects (71%) reported that they felt the highlighting of major points was helpful. The "pause cue" method was chosen by thirteen subjects and seven stated they preferred the "voice cue" method. Six subjects (46%) who reported that the "pause cue" method was helpful had scores 2 to 29 points higher than the "no cue" method. Four (57%) who chose the "voice cue" method had scores 2 to 8 points higher than with the "no cue" treatment (See Table XIV B).

All subjects were asked why they felt the specific highlighting method they chose was helpful. A sampling of the responses to the question "Why?" with the first questions follows:

"The pause helps you to understand better."

"It's better than reading - easier."

"Pauses, because you can think through what was said and get ready for the next thing."

"Easier - You don't have to work as hard when listening."

"Pause lets you get ready or organized."

"Voice cues were direct - you didn't have to guess so much as with the pauses."

"Voice kept going - a lot smoother."

"The voice cues tapes were too fast."

TABLE XIV A

STUDENTS' STATED PREFERENCE FOR HIGHLIGHTED TREATMENTS (PAUSE CUE - VOICE CUE) COMPARED WITH THEIR ACTUAL HIGHER SCORE RECEIVED DATA

GROUPS I AND II

	Pause Cue	Voice Cue
Number of Students Who Picked Treatment	24 - 80% of total group	6 - 20% of total group
Actual Number of Students Who Received Highest Score With Their Choice	14 - 58%	6 - 100%
Actual Number Who Received Lower Score With Their Choice of Treatments	9 - 38%	0
Actual Number Who Received the Same With Both Trials	1 - 4%	0

TABLE XIV B

SUBJECTS' STATED PREFERENCE FOR HIGHLIGHTED TREATMENTS (CUED - NO CUE) COMPARED WITH THEIR ACTUAL HIGHER SCORE RECEIVED DATA

GROUPS III & IV

	Cued	No Cue
Number of Students Who Picked Treatment	20 - 71% of total group	8 - 29%
Actual Number of Students Who Received Highest Score With Their Choice	10 - 50% 6/pause cue 4/voice cue	4 - 50%
Actual Number Who Received Lower Score With Their Choice of Treatments	9 - 45%	4 - 50%
Actual Number Who Remained the Same With Both Trials	1 - 5%	0

"Voice cues were distracting."

Pause - "you could go as fast as you wanted."

Pause - "It gave you something to do."

Aside from the point that subjects felt that listening was easier than reading, a few did identify some of the rationale and theory for using the highlighting techniques. Several subjects also identified factors they felt made the techniques not too helpful. These included the idea of being too distracting with two different voices or that it stopped too much. Although the "pause cue" method was preferred by the majority of subjects, there were those who found it distracting and not helpful. This serves to point out that individual differences must also be accounted for when using these highlighting techniques.

Question #2 - "Would you listen to recorded school material if it were available for you to use?"

In response to this question, only 2 of the 58 subjects stated that they did not want to listen to or use recorded school subject material.

Question #3 - "What school subjects would you like to have tapes to learn and study with in school?"

Recorded materials for math, reading, spelling, and social studies were the subject areas requested by the majority of the students. Other subject areas mentioned included art, geography, and science.

Question #4 - "What would be a reasonable or good time limit to listen to tape recorded material?"

Twenty-six of the fifty-eight subjects (44.8%) chose 30 minutes as a good time limit for taped materials, with the next highest choice being 20 minutes listed by 13 subjects (22.4%). Seven subjects listed 25 minutes and 12 said 10 to 15 minutes was a good time limit or length for tapes.

Question #5 - "What didn't you like about listening to tape recorded material?"

The only objection that was mentioned by the subjects (6 of 58) was the use of earphones. They reported that their ears got sore from listening with the earphones for long periods of time. (Subjects used earphones for approximately 35 minutes for each part of the STEP Listening Tests).

Summary of Findings

The experiment failed to show that auditory highlighting using "voice cues" or "pause cues" could significantly increase the listening comprehension scores of subjects with low reading comprehension. No type of material, as found in the STEP Listening Tests, was found to be consistently augmented by the "pause cue" or "voice cue" treatments. However, the highlighting treatment did

effect significant change in scores for different types of material when considered separately with each group.

A significant relationship between the scores achieved on the visual memory test and the difference scores for the two treatments was found at the .05 level of confidence for groups I and III. This same relationship was found to exist at the .01 level of confidence when the findings for groups I and II were combined. The measure of auditory memory and the difference scores for the two treatments was found to be statistically significant at the .10 level of confidence only for groups I and III.

Data on subjects' preference for a specific type of highlighting treatment and the treatment in which the highest score was obtained indicated that two-thirds of the subjects in groups I and II preferred the method by which they achieved highest comprehension scores. Twenty-four of twenty-eight subjects (86%) in groups III and IV reported that they believed cueing to be helpful in comprehension, but only 50% of the 28 subjects actually achieved higher scores under cued conditions.

CHAPTER IV

REFERENCES

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[2]Tatsuoka, Maurice. Multivariate Analysis. New York: John Wiley & Sons, 1971.

[3]Guilford, J. P. Fundamental Statistics in Psychology and Education. New York: McGraw-Hill Book Co., Inc., 1956, p. 145.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

Discussion

Although the experimental study did not show statistically significant differences in comprehension scores achieved under the different treatment conditions by the subjects in groups I through IV, as pointed out earlier, these non-significant comprehension score differences were in favor of the cued conditions for all groups (See Summary Data - Appendix F). There are several factors that may indeed explain the failure to show statistically significant findings. These factors include: a) number of subjects, b) characteristics of subjects, c) cueing techniques used, and d) the type of criterion task used.

There is a suggestion that cued conditions can be helpful in achieving greater listening comprehension scores. This is consistent with previous related research reported by Sticht, 1972,[1] and Ausubel, 1960.[2] It should be noted that the number of subjects in any group did not exceed 15. If the obtained difference scores are truly dependent upon the different conditions, an increase in the number of subjects would result in significant statistical findings.

Another factor to consider is that many of the subjects were school failures and perhaps the movitvation to do well was not great. Many of them exhibited a defeatist attitude during the initial testing with the visual and auditory memory measure and may have contributed only token attempts with the treatment trials. The experimenter's experience with such children suggests that their repeated failures tend to produce a defeatist attitude in which there is a tendency to believe or feel that their best efforts are not sufficient. Consequently, many learn to make token efforts which may satisfy the teacher or prove that they are trying, but which are only minimal in effort. If such token efforts were shown in the tasks required in this study, it would be expected that only minimal gains would accrue to any treatment condition.

Many of the teachers reported that they were surprised that their pupils would sit and attend for a 35 to 40 minute session. These same subjects were sometimes referred to as restless, hyperactive, and sometimes lazy or lethargic by their teachers. It may well be that the specific treatments used in this study helped the individuals to attend better and/or that escape from the classroom or novelty of the situation assisted in evoking greater attention span. This brings us to another point of consideration, which deals with the characteristics of the subjects.

The nature of the subjects used in this study may also have contributed to the failure to show significant differences with the listening comprehension treatment trial scores. These pupils were reported as poor readers with low reading comprehension. Previous research findings point out correlations varying from .45 to .80 for reading comprehension and listening comprehension. It may well be that it takes more than a cueing or highlighting technique to effect significant improvement in listening comprehension of subjects as used in this study. Specific training in how to listen, such as suggested by Lundsteen, 1971[3] and Duker, 1966, 1971[4] might have been an appropriate procedure to use with these subjects first followed by the use of the auditory highlighting treatments.

It may also be true that certain approaches to cueing are of special assistance to particular individuals. If a class or group of individuals could be identified for whom certain cues or procedures were generally facilitative, direct application to the classroom situation could be suggested. An example of this was found with two bi-lingual subjects in this study. Their listening comprehension scores showed an increase of 27 and 29 points respectively. These subjects indicated that they preferred the pause cue treatment because it gave them "time to think." They also reported that the no cue treatment went too fast for them. Two other subjects that reported that they preferred the

pause cue treatment over the voice cue treatment on the questionnaire indicated that "it gave me time to get ready and the 'voice cue' came without warning." One subject (Group I) received a score of 49 with the pause cue treatment and 38 with the voice cue treatment. The other individual (Group II) received a score of 40 with the voice cue treatment and a score of 51 with the pause cue treatment.

It should also be noted that only subjects who were experiencing reading difficulties were included in the study. Consequently, it is not know whether the cueing-highlighting techniques employed would be of greater (or possibly lesser) assistance in facilitating listening comprehension for subjects without reading deficiencies.

It is also likely that cueing techniques can be further improved with specific attempts to alter their nature and form. Techniques selected for use in this study were determined on an a priori basis and applied in a limited pilot study procedure. However, there are numerous other alternatives which might be explored relative to their strength or effectiveness in facilitating comprehension. For example, cueing might be done with an attention cue prior to the significant material, a cue highlighting the material during its presentation and a cue signalling the termination of significant material. Attention cues might include such things as pauses, flashing light, tactile

stimulations, verbal admonishment, sound stimuli or any other device which might serve to direct attention to the task. Similarily, highlighting cues (those designed to increase the stimulus value of the significant material during its presentation) might include alteration in loudness level, voice quality changes, rhythmic cues, accompaniment by visual representation of the same material (rebus type) or other techniques. Termination cues may also be of numerous types involving various forms and sensory modalities. Repetition of significant points could also be a facilitating procedure under certain conditions and would be wholly compatible with recorded material presentations.

The major purpose of these possible alternatives would be to increase the degree of comprehension and memory. An in-depth analysis of the effectiveness of any of them and their combinations is suggested as a pre-requisite to further study if one desires to maximize obtained differences.

Comparative studies with subjects who rely on listening a great deal, such as the visually handicapped, and the hearing handicapped who must rely more heavily on other sensory modalities, may do much to reveal techniques for improving the efficiency of cueing techniques. Another potentially profitable approach could include tasks in

which the subjects themselves select, arrange, or deploy the auditory highlighting cues to assist their auditory learning.

Future endeavors that attempt to determine the effectiveness of auditory highlighting procedures should have the subjects use the techniques over an extended period of time. This would assist in determining if subjects can develop procedures that will help them over time to utilize the highlighting treatments more readily. A study of the effects of training for increasing visual and/or auditory memory to assist those individuals who may be deficient in one or both should also be explored to determine their effect on listening comprehension or auding ability. These considerations may help those individuals who exhibit a lack of familiarity with the medium being used or who do not make efficient use of the highlighting technique.

The type of criterion task (STEP Listening Test) used in this study may have been an inappropriate measure to determine the effectiveness of the auditory highlighting treatments. There is very little agreement reported in the literature that supports the use of the STEP Listening Test or the other two major listening tests, Brown-Carlsen Listening Comprehension Test and the Durrell Sullivan Reading Capacity Test (Duker, 1966, 1971).[5-6] Other procedures for measuring comprehension have been suggested by Carver (1973),[7] Lundsteen (1963),[8] Spearritt (1962),[9]

Caffrey (1955),[10] and Brown (1950)[11]. It would be interesting and possibly helpful to apply cueing techniques to these other measures, particularily if they sample comprehension of a more meaningful type.

Two other areas of investigation in this study, (1) the relationships between visual and/or auditory memory measures and types of cueing treatments, and (2) subject's preference for specific types of cueing, need further study. Findings of significant relationships between auditory and/or visual memory measures and cue type for certain subject groups is somewhat difficult to interpret in view of the fact that such relationships were not consistently present for all subject groups. It is interesting however to note that the highest achieving subjects in group I on auditory memory consistently achieved highest difference scores in favor of voice cues over pause cues. Similarly, group I also showed a relationship between high visual memory and higher voice cue scores compared to pause cue scores. Other groups however gave no indication of these relationships between auditory or visual memory and the type of cue or no cue treatment used in this study.

One might expect that those high on auditory memory would perform better with auditory cueing techniques and that those scoring high on visual memory measures might perform better with visual cueing. This study did not utilize visual cueing and therefore offers no strong evidence pertaining to this question. It does however,

suggest that further study of these potential relationships would be useful and perhaps profitable. If it were shown that higher auditory memory or higher visual memory were predictive of higher comprehension with auditory or visual cueing techniques respectively, one could select procedures of maximum benefit for individual children. Thus, an approach to improving classroom performance could be demonstrated.

Based upon the data obtained in this study regarding cue preference, it is not yet clear that such preferences are indicative of increased comprehension performance. It is likely however that when difference scores are great, there is a validity to student preference. Four subjects gave, in the experimenter's opinion, unequivocal preferential response and verbal elaboration regarding their treatment preference. In each of these cases comprehension scores were markedly improved under the treatment of choice. Consequently, it is likely that student preference, when marked, could be a useful guide to the teacher in selecting instructional techniques or approaches for individual children.

Future Research Needs

In order to study the variables that are closely related to auditory learning and/or listening comprehension and factors that influence this modality of learning the

experimenter believes that the following are principal needs:

1. Studies that investigate and identify effective cueing/highlighting procedures for use with recorded materials is a primary area needing further investigation.
2. Once specific cueing procedures have been established, the focus should be to relate these to specific types of children and/or styles of learning.

Implications for Teaching

There are many variables that one can alter or change when using recorded materials for instructional purposes. A great many of these have become possible as the result of new audio equipment that has been released recently. This equipment includes the speech compressor and expander that enables one to listen to materials at his own preferred rate, repeat recorders that will repeat material immediately heard as many times as deemed necessary, and the new recording rate of 15/16 ips used by the Library of Congress and the American Printing House for the Blind that significantly increases the amount of material that can be recorded on a cassette tape. These are but a few of new equipment items now available.

The potential for the Audiomate 590 cassette tape recorder/player used in this study for individualized

instruction purposes in special and regular classes remains to be explored. This unit permits the operator (teacher, pupil or other) to insert a pause in the recording simply by pushing a button. On re-play of the material the pause will automatically occur and continue until a button is pushed for continuation. For pupils who appear to gain much from pauses, such as the bi-lingual children and those who reported "It gives me time to think," this equipment offers a very convenient way of receiving oral information at a rate which could facilitate comprehension. In addition, the interaction activity required of the learner to re-start the recorder may also be facilitative of learning as suggested in the previously cited research by Witkin (1971),[12] Farrow (1964),[13] and Allen (1960).[14]

Simms (1973)[15] has reported a "New Approach Method" used in Trenton, N. J. preschools which used recorded material focusing on pre-reading skills. It employs an interaction activity as well as a highlighting technique involving a "beep" signal for attention purposes. Although no statistical analysis is provided, he does report high interest on the part of students.

The area of "auditory learning" is experiencing a new found focus in education today. It is the hope of this author that it does not experience the misunderstanding, overestimation, and poor interpretation that "visual learning - visual perception" has acquired within the past few years in the educational mainstream. The needs are

great and the potential for this avenue for learning looks very good. It still remains for the countless studies and present ongoing efforts in this area of learning to be coordinated and communicated to the classroom teacher. The initial efforts of the "Auditory Learning Consortium" of the Special Education Instructional Materials Centers has made a significant contribution in this direction during the 1973-74 school year. Documents and publications from this project are available through the National Center for Educational Media Materials for the Handicapped located at Ohio State University and regional SEIMCs.

The contributions of Duker, Lundsteen, Spearritt, Foulke, and numerous others relating to auditory learning point out a teaching variable that is too often ignored, many times forgotten, and yet easily accessible. This channel for learning remains one of the most frequently used and earliest to be developed in the child, yet it never has been developed to its true potential within the classroom.

CHAPTER V

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APPENDICES

APPENDIX A

APPENDIX A

INITIAL DIRECTIONS READ TO SUBJECTS BEFORE EXPERIMENT

"Today we are going to listen to some taped stories. They will vary in length from 30 seconds to 3 minutes in length. Following each story there will be a group of multiple-choice questions about the story.

We are studying ways to help students to learn more when listening. Some of the tapes have been fixed to give you clues to major points in the stories. We have fixed some of the tapes with a pause cue that makes the tape recorder stop before major points in the stories. You will restart the tape by pushing the button on the button box (demonstrate) to hear the major points. A second way we have fixed the tapes is with a woman's voice to give you a clue to major points, we call this voice cue. A third set of tapes will have no cues to point out the major points. All students will listen to two types of listening tests for this study. I will tell you each time the method you will be listening to. Listen carefully, and I want you to tell me the method you prefer (like) when you finish the two tests."

"Do you have any questions at this time?"

APPENDIX B

APPENDIX B

HIGHLIGHTING EXAMPLE FOR PAUSE CUE TECHNIQUE

STEP 4A

PART TWO

(Selection VIII)

Here is the eighth selection. The speaker is telling you how to prepare something to eat.

(READING TIME - 50 Seconds)

There are several kinds of toast * French toast, cinnamon toast, milk toast, and buttered toast. But here's one you may like to try because it's different. Besides, it's easy to prepare.

* Beat two eggs in a shallow dish. Add a fourth of a cup of milk. Stir in one tablespoon of sugar and a tablespoon of grated orange rind. Then add a dash of salt. * Have ready six slices of bread. Dip each slice of bread in the egg mixture. Be sure both sides are coated lightly.

* Pour some butter or margarine into a frying pan and let it melt. Brown both sides of each slice of bread. * Serve while hot with honey, syrup, or orange marmalade. This recipe will serve six.

* Indicates where pause signal was inserted

** from Directors of Administering and Scoring Listening 4A page 13. (Educational Testing Service, 1957).

Appendix B (Cont'd)

QUESTIONS USED WITH SELECTION VIII
PART TWO OF STEP LISTENING TEST

Form 4A

Question number 1:

The recipe tells you to cook this toast in

A. a baking pan
B. an electric toaster
C. an oven
D. a frying pan *

Question number 2:

The recipe suggests that the toast be servied with

E. an egg mixture
F. honey, syrup, or marmalade
G. red raspberry jam
H. bacon and eggs *

Question number 3:

The recipe doesn't tell us

A. how many it will serve
B. how many eggs to use
C. the length of time for browning the bread
D. how much sugar to use *

Question number 4:

This would be a good recipe to try because

E. it is a different kind of toast
F. it is a familiar kind of toast
G. it is made from brown bread
H. it can be made ahead of time *

Question number 5:

The recipe doesn't tell us how much

A. milk to use
B. orange rind to use
C. bread to use
D. butter or margarine to use *

Appendix B (Cont'd)

Question number 6:

This would be a good recipe to use when you

E. don't have enough time to make regular toast
F. want a change from regular toast
G. are getting your own breakfast
H. have lots of orange juice on hand *

Question number 7:

Which of these is the best name for this talk?

A. "Several Varieties of Toast"
B. "French Toast"
C. "A Good Breakfast"
D. "Orange Toast" *

* Indicates where pause signals were used.

APPENDIX C

APPENDIX C

HIGHLIGHTING EXAMPLE FOR VOICE CUE TECHNIQUE

STEP 4B **

PART ONE

(Selection 1)

Here is the first selection. The speaker is telling you how to make a gift for your father, a board for him to hang his keys on.

(READING TIME - 30 seconds)

You will need a smooth board. Choose the size of the board according to the number of keys to be hung. Then screw a hook into the board for each key. Under the hook, print the name of the key which is to be hung there. Put a screw eye at the top of the board so that it can be hung in a handy place around the house.

** from Directions for Administering and Scoring Listening 4B, page 6. (Educational Testing Service, 1957)

Appendix C (Cont'd)

LISTENING COMPREHENSION QUESTIONS USED WITH SELECTION I - PART ONE OF STEP 4B

Question number 1:

If you want to make this present, the first thing you need is

A. keys
B. hooks
C. tools
D. a board

Question number 2:

What kind of board is suggested?

E. rough
F. painted
G. thick
H. smooth

Question number 3:

By following these directions, you could

A. have a place to print
B. collect keys
C. make something for father
D. find your key

Question number 4:

To be sure the right key is put in the right place, you are told to

E. print the names under the hooks
F. paint the keys different colors
G. draw pictures of them
H. arrange them according to size

Question number 5:

The size of the board would depend on

A. the number of hooks you have
B. the number of keys to be hung
C. the place you will hang it
D. the size of print you use

APPENDIX D

APPENDIX D

FINAL QUESTIONNAIRE ITEMS FOR AUDITORY HIGHLIGHTING STUDY

Name _____

Group Number *** _____ ***

FINAL QUESTIONNAIRE ITEMS FOR AUDITORY HIGHLIGHTING STUDY

1 - Which way of highlighting clues or major points did you prefer and find most helpful? Voice cued Pause Cued

2 - Would you listen to tape recorded school subject material if it were available for you to use?
YES NO

3 - What school subjects would you like to have tapes to learn and study with in school?

4 - What would be a good time limit or length for tape recorded school material?
5 min. - 10 min. - 15 min. - 20 min. - 25 min. - 30 min.

alternative #1 question for groups 3 & 4

1 - Do you think that (Voice cues?/Pause cues?) was helpful for you when listening to the tapes?

Appendix D (Cont'd)

5 - What didn't you like about listening to tape recorded material?

_____too fast

_____too slow

_____earphones

_____(other) _____

APPENDIX E

TABLE XV

RAW DATA FOR SUBJECTS FROM HOWELL MIDDLE SCHOOL

Subject	Group	C.A.	I.Q.	Reading Level	Grade Placement	Auditory Score	Visual Score	Trial 1 STEP 4A	Trial 2 STEP 4B
1	1	13-1	82	2.6	5	33	43	50	53
2	2	12-3	87	3.6	6	38	41	60	62
3	3	11-1	104	4.3	5	58	54	41	55
4	4	11-4	89	2.9	5	47	39	42	49
5	1	13-3	80	2.6	5	35	43	26	26
6	2	11-10	87	4.1	6	42	46	57	61
7	3	12-9	83	3.4	5	55	42	28	34
8	4	11-0	97	3.2	5	45	45	35	62
9	1	12-10	99	3.4	6	49	46	50	47
10	2	11-5	80	2.9	5	47	52	51	58
11	3	11-10	95	3.4	5	42	49	50	47
12	4	11-6	102	2.4	5	39	54	46	42
13	1	10-8	98	3.6	5	52	45	69	63

TABLE XV

RAW DATA FOR SUBJECTS FROM WAVERLY LEARNING CENTER

Subject	Group	C.A.	I.Q.	Reading Level	Grade Placement	Auditory Score	Visual Score	Trial 1 STEP 4A	Trial 2 STEP 4B
1	1	11-10	89	3.0	5	42	46	37	38
2	2	11-8	114	3.5	5	44	44	49	58
3	3	13-1	80	3.5	5	43	52	50	52
4	4	11-2	98	3.5	5	35	46	42	48
5	1	11-11	92	2.0	5	41	41	48	46
6	2	12-6	92	3.0	5	41	43	43	39
7	3	11-1	87	3.5	5	55	45	37	45
8	4	10-9	90	2.0	5	40	33	26	23
9	1	10-1	93	2.1	5	43	47	25	23
10	2	10-6	89	2.3	5	37	45	38	20
11	3	11-8	86	2.0	5	33	37	26	16
12	4	11-5	90	2.5	5	54	48	19	48
13	1	11-1	91	1.8	5	41	40	31	39
14	2	11-7	88	2.3	5	38	40	25	17

TABLE XV

RAW DATA FOR SUBJECTS FROM WAVERLY JUNIOR HIGH

Subject	Group	C.A.	I.Q.	Reading Level	Grade Placement	Auditory Score	Visual Score	Trial 1 STEP 4A	Trial 2 STEP 4B
1	1	12-0	89	2.2	6	44	48	53	52
2	2	12-11	89	2.4	6	51	47	37	31
3	3	12-1	87	2.0	6	41	40	42	30
4	4	13-0	106	2.5	6	36	44	54	49
5	1	12-1	111	3.0	6	43	43	58	56
6	2	11-8	97	3.1	6	35	50	45	41
7	3	13-6	105	3.2	6	55	45	49	42
8	4	12-10	80	3.2	6	40	45	37	36
9	1	12-9	99	3.2	6	47	48	40	35
10	2	12-0	89	3.2	6	42	47	49	38
11	3	11-9	82	3.4	6	42	44	61	50
12	4	13-7	98	3.6	6	42	55	44	41
13	1	11-5	103	3.8	6	59	54	55	54
14	2	12-2	97	3.4	6	32	30	40	51

TABLE XV

RAW DATA FOR SUBJECTS FROM WEBBERVILLE MIDDLE SCHOOL

Subject	Group	C.A.	I.Q.	Reading Level	Grade Placement	Auditory Score	Visual Score	Trial 1 STEP 4A	Trial 2 STEP 4B
1	1	11-8		3.8	6	41	44	53	59
2	2	11-6		3.9	6	43	37	51	53
3	3	11-11		3.8	6	46	48	43	41
4	4	12-2		4.2	6	42	48	41	43
5	1	11-8		4.4	6	42	42	48	51
6	2	11-6		4.4	6	46	46	49	41
7	3	11-8		3.8	6	48	50	62	62
8	4	12-3		3.8	6	52	49	51	52
9	1	12-3		2.2	5	47	32	35	25
10	2	11-3		2.9	5	40	39	37	46
11	3	11-6		2.9	5	49	32	42	34
12	4	11-3		3.0	5	35	36	47	53
13	3	11-5		2.6	5	45	41	47	40
14	2	11-6		3.7	5	48	52	58	55
15	3	12-5		2.6	5	36	33	50	52
16	4	11-6		2.7	6	45	40	30	34
17	4	11-8		3.0	6	45	45	60	51

APPENDIX F

APPENDIX F

SUMMARY OF THE SCORES ON LISTENING COMPREHENSION TESTS BY NUMBER OF SUBJECTS, PRESENTATION TIME, CUED AND NON-CUED TREATMENTS, AND TOTAL SCORE INCREASES

VOICE CUE TREATMENT

Group I - Trial 1 - 8 of 15 subjects difference total favored voice cue. Point mean difference was equal to 3.75.

Group II - Trial 2 - 7 of 15 subjects difference total favored voice cue. Point mean difference was equal to 6.29.

Group III- Trial 1 - 9 of 14 subjects difference total favored voice cue. Point mean difference was equal to 7.44.

PAUSE CUE TREATMENT

Group I - Trial 2 - 6 of 15 subjects difference total favored pause cue. Point mean difference was equal to 4.83.

Group II - Trial 1 - 8 of 15 subjects difference total favored pause cue. Point mean difference was equal to 7.50.

Group IV - Trial 2 - 8 of 14 subjects difference total favored pause cue. Point mean difference was equal to 10.25.

NO CUE TREATMENT

Group III- Trial 2 - 5 of 14 subjects difference total favored no cue. Point mean difference was equal to 6.40.

Group IV - Trial 1 - 6 of 14 subjects difference total favored no cue. Point mean difference was equal to 4.50.

Appendix F (Cont'd)

SUMMARY:

1 - 24 of 44 subjects (55%) obtained highest score with "voice cue". Range was 1 to 12 points with total of 141 points gained by 24 subjects. $\bar{x}$ = 5.87

2 - 22 of 44 subjects (50%) obtained highest score with "pause cue". Range was 1 to 29 points with total of 171 points gained by 22 subjects. $\bar{x}$ = 7.77

3 - 10 of 28 subjects (36%) obtained highest score with "no cue". Range was 1 to 14 points with total of 51 points gained by 10 subjects. $\bar{x}$ = 5.10

4 - 14 of 29 subjects (48%) obtained 111 points when "pause cue" was the last trial. $\bar{x}$ = 7.92

5 - 7 of 15 subjects (47%) obtained 44 points when "voice cue" was the last trial. $\bar{x}$ = 6.29

6 - 46 of 58 subjects (70%) obtained with highlighting a total of 312 points. $\bar{x}$ = 6.78

7 - 10 of 28 (36%) obtained with no highlighting a total of 51 points. $\bar{x}$ = 5.10

8 - 2 subjects of 58 failed to increase scores, both listening test trials remained the same.