

A COMPARATIVE ANALYSIS OF SELECTED MODES
OF PRESENTATION AS RELATED TO LEVEL
OF COMPREHENSION OF INFORMATION

By

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CHAPTER I

INTRODUCTION

During the twentieth century, many significant innovations have been introduced into the educational system. For example, compulsory school attendance has been regulated by legislative action in all states (Atkinson and Maleska), and formal schooling has been organized into a progressively graded system that starts with the nursery school and ends with the university and other forms of adult education. Yet, regardless of the legislative requirements and the many different experiments that have been attempted in organizing and conducting education, it can be said that the essential purpose of education has not been altered substantially. This purpose is to develop students' ability to think. According to the Educational Policies Commission, (1961, p. 12):

The purpose which runs through and strengthens all other educational purposes--the common thread of education--is the development of the ability to think. This is the central purpose to which the educational process must be oriented if it is to accomplish either its traditional tasks or those newly accentuated by recent changes in the world. This is not to say that it is the sole purpose, or in all circumstances the most important purpose, but that it must be a pervasive concern in the work of the school. Many agencies contribute to achieving educational objectives, but this particular objective will not be generally attained unless the educational institutions focus on it. In this context, therefore, the development of every learner's rational powers must be recognized as centrally important.

With the vast increase in the volume of knowledge available for today's students, it has become increasingly important to present

information in a form that is well organized and learnable. Without such organization, the quality of information might have a dysfunctional affect on the thinking process. This problem will become even more pressing, for the amount of knowledge is actually doubling in only a few years, making it impossible to keep the pace without using techniques that go beyond the traditional teaching methods.

Today the technology is available to develop almost any type of educational aid and to make it accessible to the public by mass production techniques. For example, devices are available that range from advanced audio equipment and video equipment for recording audio and video signals to electronic units for compressing audio recordings in order that listening time may be cut for more efficient time-usage.

Yet with the many developments in educational technology and the cultivating of progressive teaching techniques such as team-teaching, laboratories, role playing, psychodrama, non-directive classwork, and independent study, the lecture still prevails as the preferred method of presentation (Mayhew, 1969) and is the most universally accepted and utilized form of instruction in today's colleges and universities (Vineyard, 1976). This is the case even though the lecture method of instruction is a time consuming process.

The question is raised whether this method of instruction might be improved by compression technology, such as the Vocom I--which eliminates time not needed by leaving out lulls in the speech flow of prepared lectures--or Lexicon--which eliminates unnecessary portions of words. One may also ask whether reading a word-for-word printed script of the same information might be just as effective as the oral lecture in regard to student level of comprehension.

Statement of the Problem

The problem considered by this study was to determine whether statistically significant differences in level of comprehension resulted when identical material was presented via three distinct delivery systems--i.e., presentation in a printed word-for-word script, presentation in a compressed tape mode, and presentation in a normal rate tape mode.

Purpose of the Study

The purpose of the study was to investigate whether significantly different amounts of material were comprehended when three different groups of students were given the material in three different forms of presentation. The first group (Group A) was provided information in the form of a word-for-word script (printed), using a 12 minute time limit for the reading session. This time limit was calculated by using the indicated reading speed of a college junior from a well respected reading test manual (Nelson-Denny, 1974) and dividing this rate into the total number of words in the script. The second group (Group B) listened to an audio tape of the same material recorded in a compressed form. The compression was prepared at a rate of 234 words-per-minute (wpm) from a normal delivering rate of 180 wpm. The third group (Group C) listened to an audio tape of the same material presented at a normal rate of approximately 180 wpm. The material used in the experiment was the Fourth Debate Speech by Richard M. Nixon and was one of the national debates which was used during the 1960 Presidential campaign. It was selected because it was of suit-

able length, clear, and measurable. From the testing which followed each of the presentation modes, it was believed one could draw conclusions concerning the relative effectiveness of each of the three modes of presentation employed in the study.

Significance of the Study

Results of the study may provide useful suggestions for redesigning existing lecture courses and may provide information concerning alternate approaches to meeting the academic needs of students.

The findings may also add support to studies which were conducted to identify ways of aiding students with certain handicaps. A highly applicable group of handicapped students, for example, are those with partial or total blindness (Duker, 1974). The underlying objectives in all instances for research studies in time compressed speech are: (1) to improve the instructional systems; (2) to improve students' comprehension or the ability to think; and (3) to explore the effects of time-saving factors or methods.

Hypothesis

When three groups of students are provided the same material in three different forms of presentation, (i.e., material in a script form, taped material presented at a compressed rate, and taped material presented at a normal rate), there will be no significant difference in the comprehension level of the three groups as measured by a 20-item multiple-choice test.

Operational Definitions

For the purpose of this study, the terms will be operationally defined as follows:

Comprehension: The act or fact of responding correctly to the questions on a 20 item multiple-choice test.

Compressed Speech: The product which results when the rate of recorded material is reduced in length of presentation time without a resulting shift in the auditory frequency. Other names often used to refer to this product are accelerated speech, rapid speech, rate-altered speech, and time-compressed speech. (Duker, 1974)

Compression: The act of cutting away time by eliminating lulls in recorded messages. (Loftis, 1976)

Groups: A population of students who were assigned randomly to the following three groups:

Group A: A randomly selected group of students who participated in this study by reading a word-for-word script of a lecture. This group served as one of two experimental groups.

Group B: A randomly selected group of students who were provided information in the mode of audio tape which was compressed to a rate of 234 w.p.m. This randomly selected group of students served as the second of two experimental groups.

Group C: A randomly selected group of students who were provided information in the mode of audio tape which was recorded at a normal rate of approximately 180 w.p.m. This group of students served as the control group in the study.

Information/Material: The speech or lecture used in the experiment--i.e., The Fourth Debate Speech by Richard M. Nixon in 1964.

Post-Test: A 20 item multiple-choice measuring instrument administered to each student in each group after information was presented.

Script: The complete, type-written copy of the original lecture (Appendix A).

Tape: Ampex 90 tensilized polyester tape used for recording the information to be played back at the compressed rate as well as at the normal rate.

Time-Compression Unit: A machine which compresses audio recorded information by methods of leaving out portions of the original recording. In the case of this study, the recorded portions omitted were the spaces between words, as used by Vocom I.

Vocom-I: The device which compresses the input signal by starting and stopping the tape as the recording is being made. The electronic impulses being fed into the machine govern the starting and stopping process of the compression unit (Vocom-I Instructional Manual, 1972).

Words-per-Minute: wpm

Assumptions and Limitations

By randomly assigning the members of a pre-selected population--i.e., those enrolled in an Arts and Sciences course offered at Oklahoma State University in the spring of 1976--to three distinct treatments, it was assumed that the pre-selected student population was typical of the entire university population. (See table 1 for information about the students' various major fields of study.)

TABLE I
A DESCRIPTION OF MAJOR AREAS OF SUBJECTS
IN THE COMBINED TREATMENT GROUPS

Category	Number of Students
Agriculture	4
Arts and Sciences	23
Business	6
Education	6
Home-Economics	2
Non-Major	3
Total	<u>44</u>

Furthermore, it was assumed that any uncontrolled variables were distributed equally among the groups selected. In this study, several intervening variables were not held constant. Age, intelligence quotient, family backgrounds, educational backgrounds, and other factors were not considered in regard to the possible affect each might have on the participating subjects' performances in the experiment. Consequently, the findings of this study might not generalize to other groups at different institutions.

It was further assumed that environmental conditions--i.e., equal room size, shape and level of distraction--were identical for all three groups of subjects. Also, the administrators of the three modes of presentation must be assumed to be equally effective in their in-

structions and equally efficient in presenting pre-arranged instructions to the subjects.

This study should be considered as descriptive research, exploratory in nature with implications for possible additional research with more extensive testing groups.

CHAPTER II

REVIEW OF LITERATURE

One of the most important concerns to today's administrators, faculty, staff, students, and the general public is establishing how to produce learning situations that are more time-effective and at least as effective educationally as the traditional methods.

A time-compression unit is a tool that may have some promise in making the education of students less time consuming and at least as effective as traditional forms in terms of comprehension. Those who support the compression device as a way of processing educational materials for usage in educational situations, do not maintain that the systems will necessarily produce any improvement in comprehension, only that in many cases the same level of comprehension may be maintained with the added advantage of saved time. The amount of time saved can be determined by calculating the rate of compression and the man-hours involved in the related process--e.g., taping and playback--and in the time saved by the students in the learning process. The success or failure of such educational experiences depends greatly upon the organization of material to be processed and presented, as is true of any procedure.

The literature reviewed in the chapter will give the reader some idea of the breadth of research that has been conducted concerning the subject of compression usage and will also present a background for the

study. The literature reflects a broad spectrum of views by noted authorities in the field dating back a quarter of a century to 1950. A twenty-five year limit was established because applicable studies have occurred only since the year 1950.

The literature in the field, when restricted to published studies involving comprehension of material, reveals contradictory findings. Some studies favor the auditory mode, while an equal number favor the visual mode. According to a summary of research made by Duker in 1974, one researcher found a reversal of superiority between the fifth and ninth grades, with the visual mode superior in the higher grades; another found the auditory mode superior for college students and the visual mode superior for non-college adults; a third found that the rapid readers in college found the auditory mode to be of no real help in retention of given information.

In 1950, Harwood reported an investigation of 240 tenth grade students from the secondary schools of Compton, California. Seven matched selections equated for levels of reading difficulty by the Flesch Method, each 300 words in length, were presented for reading in mimeographed booklet form and orally at a controlled rate of 150 words-per-minute by means of tape recording. Subsequent to each presentation, either oral or visual, subjects answered fifteen five-part multiple-choice questions for each of the seven selections. Conclusions indicated that the series of language samples were significantly more comprehensible when presented for reading than when presented for listening.

In a study by Thomas Perry (1971), a passage of 1700 words was presented orally to subgroups from a population of 76 college students

at a rate of 150 and 250 words-per-minute. The two presentations were accompanied by slides with the speed synchronized to the oral material. On a post-test of recall as well as on a test of possible applications of the material, no significant differences were found between the different speeds. Both groups did significantly better than did a control group which had not heard the selection.

In 1970, Clement Parker conducted a study which was designed to determine the practicality of using time-compressed speech as an instructional technique at the junior college level. Secondary problems related to that study were the determination of the degree of compression possible without significant loss of comprehension, the degree to which simultaneous reading and listening would help or hinder comprehension at different degrees of compression, and the effect of rate and mode of presentation on students of varying degrees of aptitude.

Subjects in the study were 429 college students, and selections from the Nelson-Denny Reading Test were presented at normal rates, compressed one-third, and compressed one-half. The following results were reported from the performance of the students on the comprehension test of the Nelson-Denney Reading Test: no significant difference between the normal rate and one-third compression in any mode or for any aptitude level was found; in the aural-only mode, one-half compression was significantly less satisfactory than one-third compression; and except in the case of low aptitude students, the one-half compression in the aural-visual mode was as satisfactory as the one-third compression.

In a study on retention, Allen and Travers (1967) used material from the Davis Reading Test which was compressed by removing redundant words so that only 80, 60, 40, and 20 percent of the original passage

remained. The original passage and the word-compressed passages were recorded at 200 words-per-minute and then compressed on a Tempo Regulator by removing 20, 40, 60, and 80 percent of the passages for each of the previously word-compressed versions. Efficiency scores were computed by dividing the time for each presentation by the number of correct answers on a comprehension test. Maximum learning per unit of time occurred when the version involving 80 percent of the words was compressed to 40 percent of the original time, which constituted a rate of 400 words-per-minute.

Many studies have been conducted using subjects who were blind or partially blind. These range from studies utilizing compressed materials only to combination studies of compressed materials augmented with visual aides (e.g., slides, films, overheads). These studies have most often been conducted in schools for the blind by instructors in the schools.

Other studies have considered the sex element. The results of some experiments indicated that there were differences in the effectiveness of the male and female voice at varying compression levels. In a study by Sally McCracken (1971), the sex of the speaker was compared with or related to the motivation of the listeners. Passages were read to 180 college speech students at a normal rate of approximately four syllables per second. When skin response was measured, males showed a higher conductance level than did females to both male and female voices, but no significant correlation was found for the subjects between comprehension test scores and the skin response data. On the other hand, the skin tests correlated negatively with comprehension scores for the males and positively for the females, when listening to the male and female voice recordings, respectively.

Most of the studies that have been conducted concerning the usage of compressed materials tend to be measuring comprehension at varying levels of speech compression. These compressions range from 174 words-per-minute to as high as 435 words-per-minute.

In 1972, Loretta Adelson conducted an experiment using 200 college students who were instructed to listen to an uninterrupted one-hour lecture composed of three passages presented at 175 words-per-minute and a 40 minute lecture composed of three equated passages presented at 275 words-per-minute. A multiple-choice test of comprehension composed of 75 items and a questionnaire was administered following each lecture.

The results of a statistical analysis of the comprehension test showed significantly less comprehension occurred at 275 than at 175 words-per-minute. Comprehension scores were higher for the first and third passages of each lecture than for the middle passage. Adelson felt this might have resulted because of retroactive inhibition in the second passage and a reactive increase of energy in the third passage.

The response of an attitude questionnaire revealed that a significantly larger number of subjects reported feelings of fatigue and anxiety while listening to material recorded at a compressed rate in comparison to those listening to material recorded at a normal rate.

A study by Arreed Barabasz (1968) indicated there was no significant loss in recall or retention of information at a compressed rate, when compared to a similar group receiving the material at a normal (180 wpm) rate. The compression in this study was from 21 minutes to 14 minutes. The subjects were college students, and the grouping was heterogeneous. No indication was given as to the type of statistical analysis used.

Emerson Foulke (1968) reported a study in which he found there was

no significant difference in comprehension related to the pitch at which the listening selection was reproduced. He felt this suggested that listening comprehension was not affected by variations in word intelligibility when produced in a method of increasing pitch from version to version, in equal steps, through a range of approximately one octave.

The report investigated rate preferences of college students and found the mean-preferred listening rate was 207 words-per-minute, a rate well above the speech rates typically reported in most literature. It went on to say that, with subjects of low IQ level, comprehension began to decline when the normal word rate of 180 words-per-minute was exceeded.

Perhaps the study closest to the one described in this paper was one conducted by Robert E. Jester in 1966. The experiment concerned three parallel forms of the Davis Reading Tests which were administered to 90 subjects auditorially, visually, and in a combination of the two modes of rates varying from 200 to 400 words-per-minute in 50 words-per-minute increments.

The findings indicated that as the rate increased the level of comprehension decreased, especially after 300 words-per-minute. This was thought to be due to the information processing capability of the individual rather than to the intelligibility of the material. When the two modes were presented simultaneously, the individual selected the modality which was best for him. This result supported Broadbent's (1956) conclusion that when the information processing capacity of the perceptual system is overloaded, it operates as a single-channel system.

Based on studies reported in the literature, it can be concluded that additional research needs to be conducted to further knowledge

concerning the effectiveness of using three modes of presentation of the same material.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

The purpose of this chapter is to explain the nature of the study, to present the method used to select the subjects, to describe the design and procedures, and to describe the procedures for data collection and analysis.

Nature of the Study

The problem considered by this study was to determine whether statistically significant differences in level of comprehension resulted when identical material was presented via three distinct delivery systems--i.e., printed script, oral presentation at a compressed rate, and oral presentation at a normal rate.

This study required the collection of data from three groups during three simultaneous testing sessions. This information was kept separated according to groups to facilitate analysis. The study was conducted during the second week of March, 1976.

Selection and Description of Subjects

The subjects were the 1976 spring semester enrollees in an Arts and Sciences course at the Oklahoma State University (Oklahoma State University Catalog, 1975-76). By using a table of random numbers, students were assigned to three groups, of which two groups were to serve

as experimental groups and the other was to be a control group. Group A,B, and C were composed of 14, 15, and 15 subjects respectively. These groups were from a population which was chosen because of availability. There was no reason to believe that this population should have had any previous knowledge of compressed speech even though they were in a media area course.

Procedures

Pre-Administration Session: In administering the treatment nine assistants were used. A meeting was held to inform and prepare the individual assistants for their role in the study. The assistants were first introduced to each of the three modes of presentation used in the study. This included reading a word-for-word script of Nixon's Fourth Debate speech with Senator John F. Kennedy in 1964 and listening to parts of the two tapes of the speech, one at a compressed rate, and the other at a normal rate.

Each of the nine assistants were given:

- (a) the tests to be administered to his or her group;
- (b) a list of the names of his or her group members;
- (c) a time sheet indicating the time when each part of the session should occur;
- (d) and the audio tapes, both compressed and normal, and a word-for-word printed script of the speech.

Next, each individual assistant (three for each group) was instructed in the special mode of presentation to be used with the group to which he or she was assigned and the duties which each was to carry out during the session.

Group A: Subjects in this group were to read the word-for-word

script of the speech. The assistants were instructed to have the subjects sit in the testing room using every third desk, to instruct each one to have a pencil or pen ready to use during the testing and to be sure each subject was aware that only a twelve-minute period was to be allowed for the reading of the script (as recommended in Nelson-Denny Reading Test, 1975, Forms C and D).

After testing instructions were presented, the subjects were assured that the grades from the short examination would be treated statistically as a group and not as individual scores. The individual scores would have no effect whatsoever on any student's course grade, but these scores would be made available to students interested in knowing about their individual performance.

After allowing time for questions about the instructions from the test subjects, assistants passed out copies of the manuscript.

At the end of the twelve-minute reading period, the subjects were instructed to pass their manuscripts to the outside aisle, at which time they were picked up by an assistant.

At this point in time, the testing was accomplished by the use of an author-prepared 20-item multiple-choice testing instrument which was validated by an authority in the field of testing (Hampton, 1976).

A copy of the multiple-choice test was passed out by an assistant to each of the subjects. They were instructed to raise one hand upon completing the testing exercise as an indication that they were finished and ready to have an assistant pick up their test. They were further instructed that no subjects were to leave the testing room until all the tests had been returned to the testing assistants.

Group B: This group was handled the same as Group A except that

instead of reading the material the subjects listened to an audio tape in which the material had been compressed to 234 words-per-minute and a playing time of approximately seven minutes. To acclamate the subjects to the techniques of compressed speech, they listened to a sample of such compressed material for three minutes. The material was different from that used in the experiment.

The steps which followed after the initial listening exercise were the same as the above steps for group A.

Group C: This group listened to the tape at the normal rate of approximately 180 words-per-minute. The subjects in this testing session followed the same procedures as group A regarding administration of the test and the collection of material.

Data Analysis Procedures

The data from this study was composed of the raw scores on a 20-item multiple-choice test administered to the 44 subjects, 14 of which were in group A, while 15 were in groups B and C.

Tabulation of the data was accomplished through a frequency count by determining the numbers and percentages of right and wrong responses for each of the twenty questions on the testing instrument. A chi-square test of homogeneity among groups for each question was utilized, followed by a one-way classification analysis-of-variance on percentile scores.

The percentage count, chi-square technique, and the one-way classification analysis-of-variance were employed to establish whether there were significant differences in level of comprehension of information among those who read a word-for-word script of the original speech;

those who listened to a tape of compressed material; and those who listened to a tape at a normal rate.

CHAPTER IV

FINDINGS OF THE STUDY

In this study, students from a pre-selected group were assigned at random to three treatment groups--i.e., Group A, which read a word-for-word script of the speech by Richard M. Nixon; Group B, which was given the same information but in the form of a compressed audio tape--i.e., 234 wpm; and Group C, which received the information in the form of audio tape at the rate of 180 wpm. After the material was presented, a 20-item multiple-choice test was administered to the subjects. The results of the test are summarized by groups in tables II and III. Figures 1, 2, and 3 graphically describe the findings shown in Table III and Figure 4 represents a composite of all three graphs.

The use of taped material at a normal rate has been utilized for many years in educational settings as a teaching tool. Therefore, for this study it was used as an experimental control device, in that it is most commonly accepted as being "close to reality" in an audio-visual setting.

The data were analyzed by two statistical techniques. First, a chi-square analysis-of-variance treatment of the total scores by groups. It was found that there were no significant differences among the groups when total scores were used (See Table IV). However, statistical significance was indicated on question 20 of the test, which was

TABLE II

SUMMARY OF SUBJECTS' RESPONSES BY GROUPS TO
A 20-ITEM MULTIPLE-CHOICE TEST MEASURING
LEVEL OF COMPREHENSION OF THE MATERIAL
PRESENTED IN THE EXPERIMENT

Questions	GROUP A Responses		GROUP B Responses		GROUP C Responses	
	Right	Wrong	Right	Wrong	Right	Wrong
Q1	14	0	15	0	13	2
Q2	12	2	13	2	12	3
Q3	11	3	14	1	11	4
Q4	10	4	14	1	14	1
Q5	10	4	8	7	10	5
Q6	7	7	10	5	9	6
Q7	9	5	11	4	10	5
Q8	11	3	10	5	8	7
Q9	12	2	8	7	12	3
Q10	5	9	3	12	6	9
Q11	13	1	9	6	12	3
Q12	14	0	13	2	14	1
Q13	13	1	13	2	11	4
Q14	8	6	4	11	8	7
Q15	12	2	12	3	8	7
Q16	2	12	2	13	5	10
Q17	9	5	7	8	9	6
Q18	12	2	13	2	14	1
Q19	12	2	12	3	13	2
Q20	14	0	15	0	11	4

TABLE III
SUMMARY OF THE RESPONSES IN PERCENTAGE FORM
FROM A 20-ITEM MULTIPLE-CHOICE TEST

Question	GROUP A Responses		GROUP B Responses		GROUP C Responses	
	Right	Wrong	Right	Wrong	Right	Wrong
Q 1	100.0	00.0	100.0	00.0	86.7	13.3
Q 2	85.7	14.3	86.7	13.3	80.0	20.0
Q 3	78.6	21.4	93.3	06.7	73.3	26.7
Q 4	71.4	28.6	93.3	06.7	93.3	06.7
Q 5	71.4	28.6	53.3	46.7	66.7	33.3
Q 6	50.0	50.0	66.7	33.3	60.0	40.0
Q 7	64.3	35.7	73.3	26.7	66.7	33.3
Q 8	78.6	21.4	66.7	33.3	53.3	46.7
Q 9	85.7	14.3	53.3	46.7	80.0	20.0
Q10	35.7	64.3	20.0	80.0	40.0	60.0
Q11	92.9	07.1	60.0	40.0	80.0	20.0
Q12	100.0	00.0	86.7	13.3	93.3	06.7
Q13	92.9	07.1	86.7	13.3	73.3	26.7
Q14	57.1	42.9	26.7	73.3	53.3	46.7
Q15	85.7	14.3	80.0	20.0	53.3	46.7
Q16	14.3	85.7	13.3	86.7	33.3	66.7
Q17	64.3	35.7	46.7	53.3	60.0	40.0
Q18	85.7	14.3	86.7	13.3	93.3	06.7
Q19	85.7	14.3	80.0	20.0	86.7	13.3
Q20	100.0	00.0	100.0	00.0	73.3	26.7

TABLE IV
ANALYSIS OF VARIANCE FOR PERCENTILE SCORE

Source	d.f.	MS	F	Obs. Sig. Level
Total	43	.00882		
Among Groups	2	.01599	1.89	.1625
Within Groups	41	.00847		

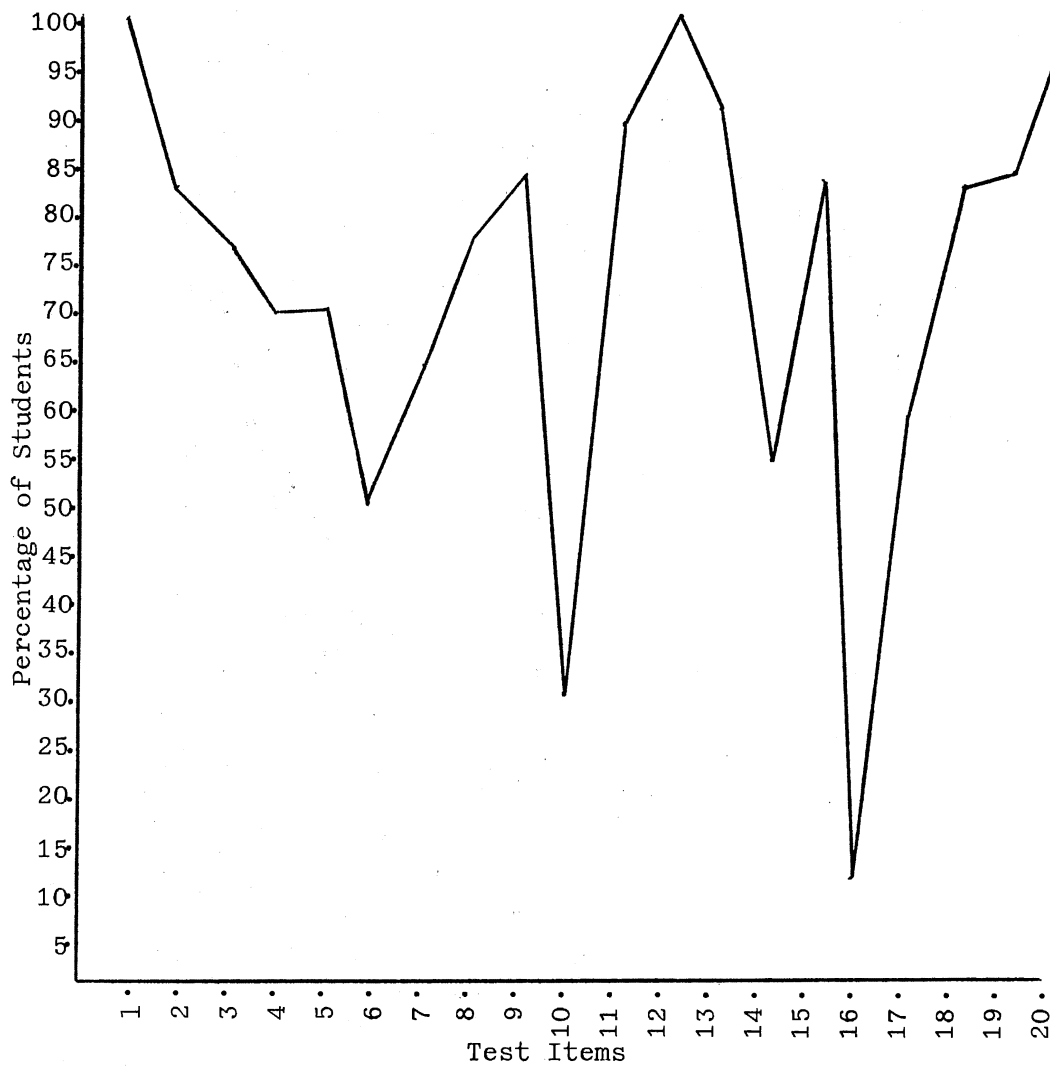


Figure 1 - Percentages of Students Making Correct Responses
On a 20-Item Multiple-Choice Test - Group A

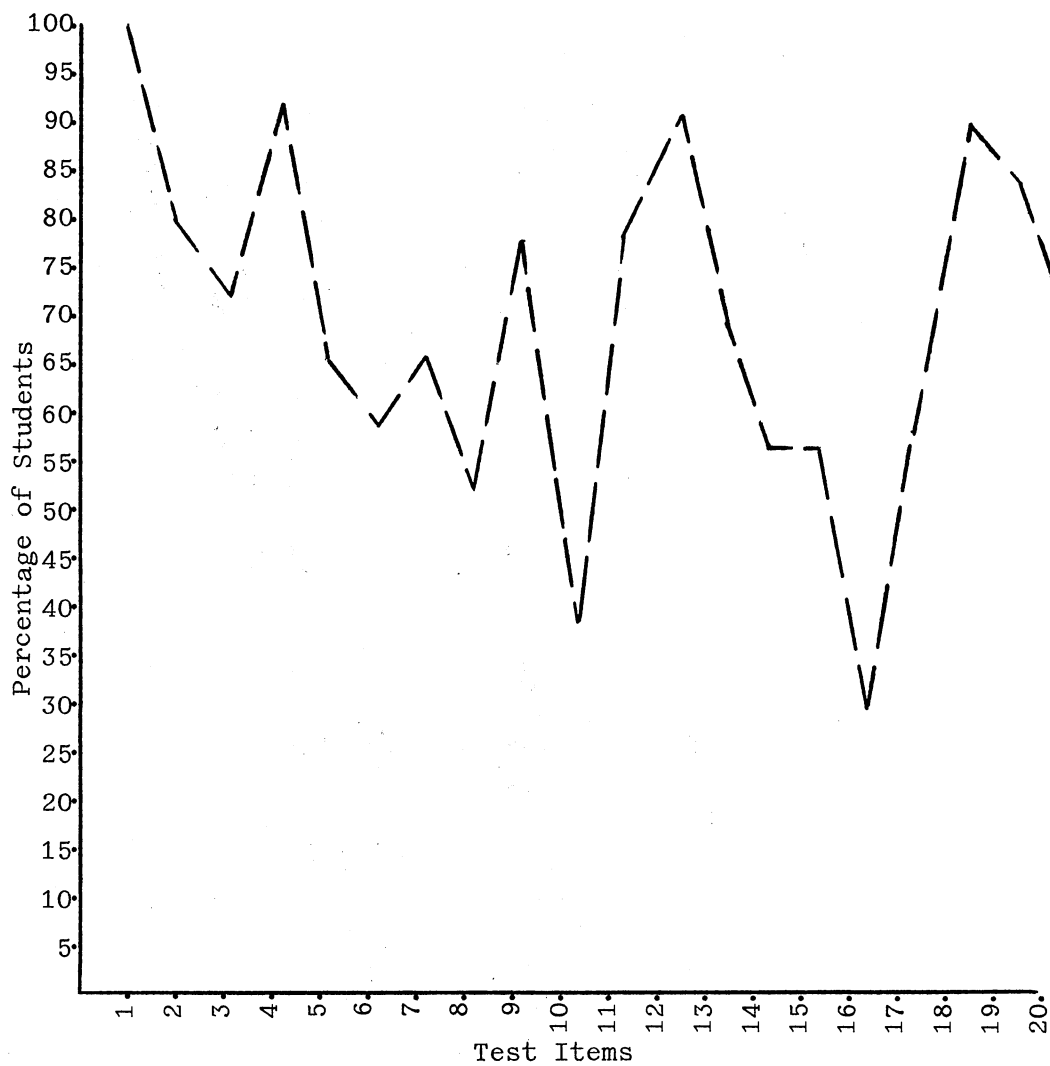


Figure 2 - Percentages of Students Making Correct Responses
On a 20-Item Multiple-Choice Test - Group B

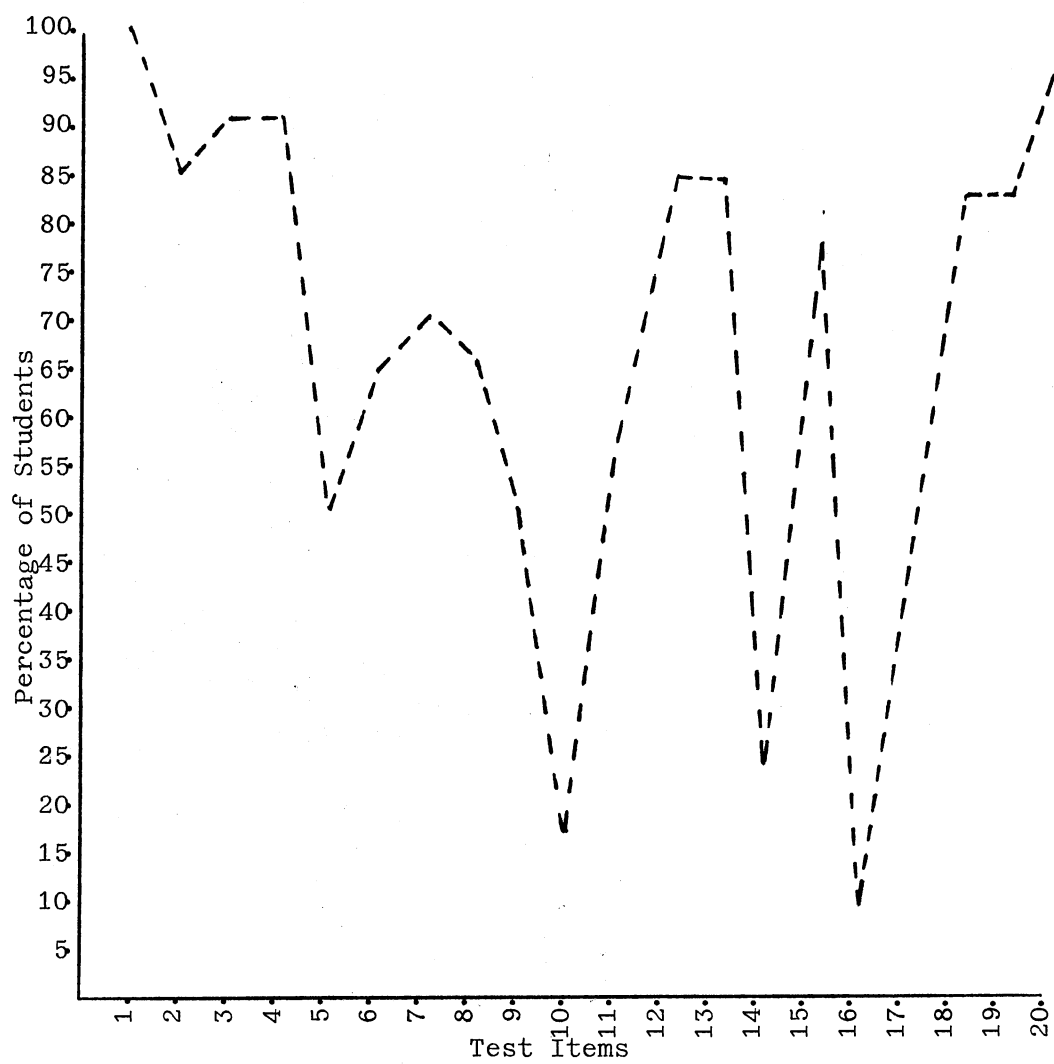


Figure 3 - Percentages of Students Making Correct Responses
On a 20-Item Multiple-Choice Test - Group C

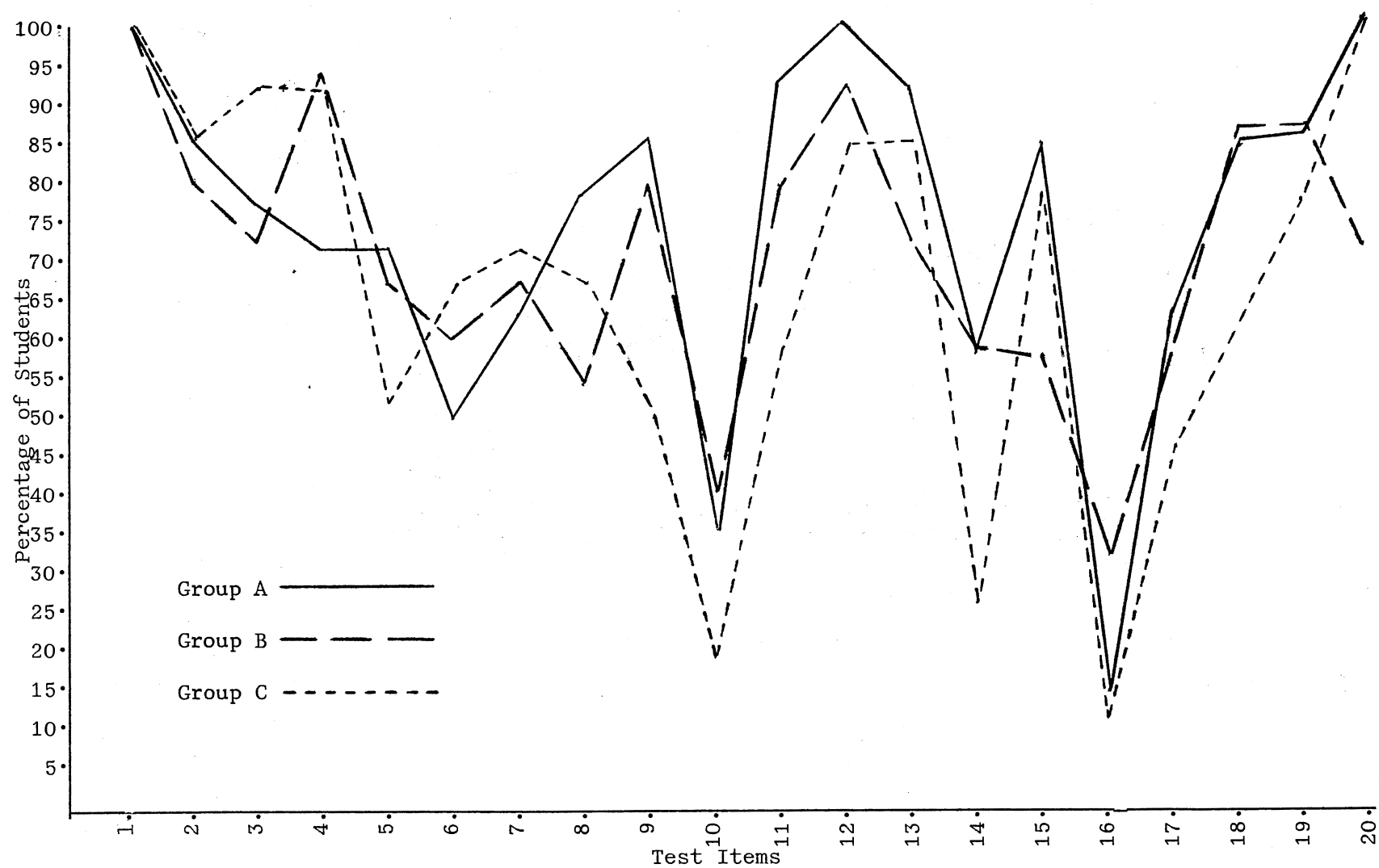


Figure 4 - A Percentage Profile of Students from all three Groups Making Correct Responses on a 20-Item Multiple-Choice Test

thought to be only a characteristic of the random grouping and not a significant finding in this study. Also, the study was not designed such that the findings could be analyzed properly.

When contrasting the results--i.e., level of comprehension of information (material in script form, tape material at a compressed rate, and the same material in normal tape form), no significant difference between the three modes was indicated.

In recent years using materials that have been recorded at a compressed rate has grown in popularity, but little research has evaluated the consequences of such an instructional technique. The research to date has indicated little difference in the comprehension levels of subjects when they are low percentage compressions, when compared with other forms of instructional presentations. The findings in this study, using an approximate 30 percent compression rate, tend to substantiate these previous studies.

Correlation Technique

When three groups of subjects are provided material in three different forms of presentation--i.e., the word-for-word script form, taped material at a compressed rate (234 wpm), and taped material at a normal rate (180 wpm)--the comprehension level of the three groups will be the same. This was the hypothesis as presented in Chapter I.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Review of the Study

The purpose of this study was to investigate whether significantly different levels of comprehension resulted when three different groups of students were given identical material in three different forms of presentation. The subjects who participated in the study were enrolled in a sophomore-junior college level Arts and Sciences course, which was selected because of its availability and size. The subjects were assigned at random to one of three treatment groups. The first of these groups (Group A) was provided the information in the form of a word-for-word script, using a 12 minute time limit for the reading session. The second group (Group B) listened to the same material presented by audio tape at a compressed rate--i.e., 234 words-per-minute. The third group (Group C) listened to the same material presented orally by audio tape at a normal rate of approximately 180 words-per-minute. From the testing that followed each presentation mode, it was believed one could draw conclusions concerning the relative effectiveness of each of the three modes of presentation employed in the study.

The study involved collecting data from the three groups and subjecting the data to statistical treatment by computer in the Oklahoma State University Computer Center located in the Mathematical Sciences building on campus at Stillwater, Oklahoma, and analyzing the results.

Summary of Findings

The hypothesis of this study was that no significant difference exists in the comprehension level of three groups of students when three modes of presentation of selected information are compared. Two statistical techniques--chi-square and analysis-of-variance--found no evidence of difference in the comprehension level of the three groups, each of which received information by one of the three modes of presentation. Thus, after testing the hypothesis experimentally, the hypothesis was not rejected.

In addition, it should be noted that findings of the study were presented in Figure 4 (page 28) where graphically it appeared that Question 20 (Q 20) reflected a wide scoring difference among the three groups. Group C (Normal Rate) scored somewhat lower than did Group A (Script) and Group B (Compressed). Also, in Table II, it appears that Q 9, Q 11, and Q 15 indicate a lack of homogeneity in scores and indicate a P value of less than .10.

The grand mean was found to be 14.25 for combined groups. The Group A mean was 14.2. The group B and C means were 14.7 and 14.2, respectively. The maximum scoring possible on the test was a raw score of 20. These techniques found the probability of no significant difference at the .05 level.

When the results are viewed in light of the hypothesis presented in Chapter I, it can be said that the hypothesis is not rejected, for there was no significant difference in learning comprehension among the three groups of students, when each group was provided with a distinct mode of presentation.

When the three group scores were analyzed, an F value of 1.887 was

obtained, indicating a 0.162 probability of significance. Thus, there was an 0.838 probability of no significant difference and we would not reject the hypothesis.

It should be noted that the findings of this comparative study resulted from one particular approach to collecting data, comparing results, and analyzing group responses in one educational setting at one specific institution. As stated in the limitations of the study, the results of this study should not be generalized to other settings.

Conclusions and Recommendations

Since education in today's society is pressed for time when considering the growing volume of information which students need to master, ways need to be found to speed up this process. The findings of this study indicated that no significant difference was found in the three modes of presentation--i.e., word-for-word script form, compressed audio tape, and normal rate tape--one of which allowed an approximate thirty percent saving in the learner's time. Therefore, it should be concluded that areas utilizing materials which could be converted into the compressed mode of presentation should consider doing so. It can also be said that additional research should be considered in specific areas of compressed speech.

- (1) The study should be replicated using different subjects from different populations.
- (2) Further studies should utilize the same design as that found in this study but with a pre-test to establish whether differences existed prior to the treatment.
- (3) Studies should be conducted, using the same design as that

found in this study with the addition of different rates of compressed material.

- (4) Further studies should be designed using different lengths of time of messages, recording voice quality, and varying forms of administering techniques.
- (5) Further studies should be designed to find whether training of subjects to be rapid listeners would change the findings of studies such as this study. A pre-testing design might be most appropriate for finding this information.
- (6) In future experiments, the test items could be designed to see if compressed speech offers teaching help in the non-cognitive areas.
- (7) The studies using pre-test/post-test design could be used to establish whether student's level of comprehension are affected by the usage of compressed speech.

Institutions of higher education are rapidly changing with respect to teaching techniques, learning theory, and societal expectations. A student's time involvement with study, classroom, and research can perhaps be helped by compressed speech utilization. The value of time saved by such a method could have, when thought of as universal time-savings, a staggering effect on industry as well as education. With the interest, enthusiasm and expertise of qualified professional educators, the student of today will be equipped to accept the challenge and expectations of mankind.

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APPENDIX A

HANDOUT FOR STUDENTS ENROLLED

IN TEST CLASS

FALL, 1975

Your class in Radio-Television-Film, 3663 will be participating in a research project to compare the comprehension of basic information presented in three different modes of presentation. (Script, Audio Tape at a normal playback rate, and Audio Tape Compressed)

On the following two pages, you will find three separate groups listed. In one of these lists, you should find your name. You were selected for your particular group completely at random.

After the initial instructions have been given for the experiment, you will divide into the three groups and move to your pre-arranged meeting room.

You will be given instructions for your group's part in the experience at that time. The entire session should last no longer than the regular class session.

Thank you for your participation in this experimental research project. I hope you will find the experience both entertaining and informative.

Larry Godley

APPENDIX B

A WORD-FOR-WORD SCRIPT

OF

RICHARD M. NIXON'S OPENING STATEMENT:

THE FOURTH DEBATE

OCTOBER 21, 1960

Mr. Howell, Senator Kennedy, my fellow Americans, since this campaign began I have had a very rare privilege. I have traveled to forty-eight of the fifty states, and in my travels I have learned what the people of the United States are thinking about. There is one issue that stands out above all the rest; one of which every American is concerned, regardless of what group he may be a member, and regardless of where he may live. And that issue, very simply stated, is this: how can we keep the peace, keep it without surrender-- how can we extend freedom, extended without war.

Now in determining how we deal with this issue we must find the answer to a very important but simple question. Who threatens the peace--who threatens freedom in the world? There is only one threat to peace and one threat to freedom. That is presented by the International Communist Movement. And, therefore, if we are to have peace, if we are to keep our own freedom and extend it to others without war, we must know how to deal with the Communists and its leaders.

I know Mr. Khrushchev. I also have had the opportunity of knowing and meeting other Communist leaders in the World. I believe there are certain principles we must find in dealing with him and his colleagues. Principles, if followed that will keep the peace and also can extend freedom. First, we must learn from the past, because we cannot afford to make the mistakes of the past.

In the seven years before this administration came into power in Washington, we found that six-hundred-million people went behind the iron curtain. And, at the end of that seven years, we were engaged in a war in Korea which cost over thirty-thousand American lives. In the past seven years, in President Eisenhower's Administration, the situation

has been reversed; we ended the Korean War. By strong, firm leadership, we have kept out of other wars, and we have avoided surrender of principle or territory at the conference table.

Now why were we successful as our predecessors were not successful? I think there are several reasons. In the first place, they made a fatal error in misjudging the Communists and in trying to apply to them the same rules or conduct that you would apply to the leaders of the Free World. One of the major errors they made was the one that led to the Korean War. In ruling out the defensive Korea, they invited aggression in the area. They thought they were going to have peace. It brought war. We learned from their mistakes. And so, in our seven years, we find that we have been firm in our diplomacy. We have never made concessions without getting concessions in return. We have always been willing to go the extra mile to negotiate for disarmament or in any other area, but we have never been willing to do anything that in effect surrendered freedom any place in the world. That is why President Eisenhower was correct in not apologizing or expressing regrets to Mr. Khrushchev at the Paris Peace Conference as Senator Kennedy suggested he could have done. That is why President Eisenhower was also correct in his policy in the Formosa Straits where he declined and refused to follow the recommendations; recommendations which Senator Kennedy voted for in 1955, again made in 1959, and repeated in his debates that you have heard, recommendations with regard again slicing off a piece of free territory and abandoning it if in effect to the Communists. Why did the President feel this was wrong and why was the President right and his critics wrong? Because, again this showed a lack of understanding of dictators. A lack of understanding

especially of Communists, because every time you make such a concession it does not lead to peace, it only encourages them to blackmail you; it encourages them to bring a war. And, so I say the records show we know how to keep the peace, to keep it without surrender.

Let us move now to the future. It is not enough to stand on this record, because we are dealing with the most ruthless, fanatical leaders the world has ever seen. That is why I say that in this period of the Sixties, America must move forward in every area. First of all, although we are today, as Senator Kennedy has admitted, the strongest nation in the world militarily, we must increase our strength. Increase it so that we will always have enough strength that regardless of what our potential opponents have, if they should launch a surprise attack, we would be able to destroy their war-making capability. They must know in other words that it is National suicide if they begin anything. We need this kind of strength, because we are the guardians of the peace. In addition to military strength, we need to see that the economy of this Country continues to grow. It has grown in the past seven years. It can and will grow even more in the next four. And the reason it must grow even more is because we have things to do at home, and also because we are in a race for survival, a race in which it isn't enough to be ahead; it isn't enough simply to be complacent. We have to move ahead in order to stay ahead. And that is why in this field, I have made recommendations which I am confident will move the American economy ahead; move it firmly and soundly so that there will never be a time when the Soviet Union will be able to challenge our superiority in this field. And so, we need military strength, we need economic strength, we also need the right diplomatic policy.

What are they? Again we turn to the past; firmness but no belligerence. And by no belligerence I mean that we do not answer insult by insult. When you are proud and confident of your strength you do not get down to the level of Mr. Khrushchev and his colleagues. And that example, President Eisenhower has set, we will continue to follow.

But all this by itself is not enough. It is not enough for us simply to be the strongest militarily, the strongest economically, and also to have firm diplomacy; we must have a great goal and that is not just to keep freedom for ourselves, but to extend it to all the world. To extend it to all the world, because that is America's destiny. To extend it to all the world, because the Communists' aim is not to hold their own, but to extend communism; and you cannot fight a victory for communism or strategy a victory for communism with a strategy simply to holding the line. And so I say that we believe that our policies of military strength, of economic strength, of diplomatic firmness, first will keep the peace and keep it without surrender. We also believe that in the great field of ideals that we can lead America to the victory for freedom. Victory in the newly developing countries. Victory also in the captive countries, provided we have faith in ourselves and faith in our principles (Great American Speeches, 1950-1963).

APPENDIX C

20 ITEM MULTIPLE-CHOICE

MEASUREMENT

INSTRUMENT

QUESTIONS

1. Mr. Nixon refers to one issue that stands out above all others in the thoughts of the American people. That is: (a) how can we improve economic conditions, (b) how can we establish a successful foreign policy, (c) how can we keep peace and freedom?
2. Mr. Nixon refers to his travels to (a) 48 states, (b) 49 states, (c) 50 states of the Union while Vice-President.
3. In determining how to deal with the issue of maintaining peace and freedom, the Vice-President said: (a) We must answer the question of who threatens peace, (b) We must answer who threatens freedom, (c) We must answer who maintains the largest armies, (d) both a and b.
4. The International Communist Movement is described as: (a) the force moving the World closer to Socialism, (b) the one threat to peace and freedom, (c) the enemy of all Nations who believe in the principles of Democracy.
5. To keep our freedom and extend it to others without war will depend upon: (a) knowing how to deal with the Communists and their leaders, (b) being militarily strong, (c) controlling the armament of the free world, (d) aiding in the development of a strong NATO pact.
6. When dealing with Mr. Khrushchev and his friends, the United States must first: (a) be honest and straight-forward in our demands, (b) learn from the past, (c) let them know that we will meet any force with force.
7. In the seven years before this administration (That administration of President Eisenhower) came into power: (a) 8,000,000 people went behind the iron-curtain each year, (b) 4,000,000 people went

behind the iron-curtain each year, (c) 6,000,000 people went behind the iron-curtain each year.

8. During the Korean Conflict, more than (a) 40,000, (b) 30,000, (c) 29,000 Americans lost their lives.
9. In the Korean War, the leaders of the world: (a) misjudged the Communists and applied the same rules to them as would be applicable to leaders of the Free World, (b) failed to prepare for a war that was sure to surface, (c) misjudged the power of the conference table.
10. Mr. Nixon used the term "going the extra mile." He referred to: (a) disarmament, (b) peace talks, (c) funding the less fortunate Nations of the World.
11. According to Mr. Nixon, Senator Kennedy suggested: (a) the President should invite Khrushchev to re-visit America, (b) the President should apologize to Khrushchev, (c) the United States should aid Formosa in its quest to industrialize.
12. Senator Kennedy voted for recommendations concerning Formosa in 1955: (a) with regard again slicing off a piece of free territory and abandoning it if in effect to the Communists, (b) with regard to abandoning the entire area beyond the 38th Parallel.
13. Mr. Nixon says that in the future: (a) it is not enough to stand on past records, (b) great economic problems will face the Free World, (c) the United States will be called on to feed the World.
14. Mr. Nixon called war-making: (a) national suicide, (b) a problem we must prepare for, (c) the number one concern of the Communists, (d) stupidity.

15. Mr. Nixon said that during the period of the Sixties: (a) the Nation will reach its greatest GNP, (b) that America must move ahead in every way, (c) the Free World must prepare against surprise attack from the Communist block.
16. Mr. Nixon said, "it has grown in the past seven years." He referred to: (a) military strength, (b) economic strength, (c) the frequencies of Communist triggered disturbances, (d) both a and b.
17. Mr. Nixon said that we are in a race for: (a) military supremacy, (b) survival, (c) economic supremacy.
18. According to Mr. Nixon, the United States needs: (a) military strength, (b) economic strength, (c) the right diplomatic policy, (d) all of the above.
19. Mr. Nixon says the past teaches us: (a) to answer insult to insult, (b) to get down to the level of Mr. Khrushchev and his colleagues, (c) to use firmness but not belligerence.
20. Mr. Nixon thinks America's destiny is: (a) to extend freedom to all the World, (b) dominate the rest of the World, (c) feed the rest of the World, (d) all of the above.

APPENDIX D

KEY TO THE MULTIPLE-CHOICE
MEASUREMENT INSTRUMENT

KEY TO TEST QUESTIONS

1. C
2. A
3. D
4. B
5. A
6. B
7. C
8. B
9. A
10. A
11. B
12. A
13. A
14. A
15. B
16. B
17. B
18. D
19. C
20. A

VITA²

Larry Bartlett Godley

Candidate for the Degree of
Doctor of Education

Thesis: A COMPARATIVE ANALYSIS OF SELECTED MODES OF PRESENTATION
AS RELATED TO LEVEL OF COMPREHENSION OF INFORMATION

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