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AN APPLICATION OF PROGRAMMED LEARNING
TO INFORMATIVE SPEECH

A DISSERTATION

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The Ohio State University
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Approved by

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CONTENTS

	Page
TABLES	v
ILLUSTRATIONS	vi
 Chapter	
I. INTRODUCTION	1
Theoretic Considerations	4
Definition of Terms	8
Speech purpose	8
Information	9
Comprehension	10
Programmed learning	12
General Plan of the Study	14
II. REVIEW OF THE LITERATURE	17
Informative Speech	17
Programmed Learning	23
The nature of programmed learning	23
Experimentation	26
III. THE STUDY OF TWO PROGRAMMED LECTURES	34
The Experimental Stimuli	34
Selection of lecture material	34
Programming the experimental speeches	39
Validation and comparison of speech forms	42
The Comprehension Test	46
Hypotheses	47
Experimental Design and Administration	48
Results	52

CONTENTS (contd.)

Chapter	Page
Statistical analysis	52
Hypothesis I	55
Hypothesis II	55
Hypothesis III	56
Hypothesis IV	56
Hypothesis V	57
IV. THE STUDY OF A REVISED PROGRAMMED LECTURE	61
The Experimental Stimuli	62
Selection of the speech subject	62
Selecting the experimental speech forms	63
Development of the experimental speeches	63
Speech comparisons	68
Measuring Instruments	68
Multiple choice tests	68
Semantic differential	70
Estimated error	70
Administration	71
Hypotheses	72
Results	72
Analyses of results	72
V. SUMMARY AND IMPLICATIONS	84
Summary	84
Implications	87
BIBLIOGRAPHY	90
 APPENDIXES	
A. Original Temperature Outline	94
B. Purpose Outline of Temperature Speech	98
C. Traditional Temperature Speech	101

CONTENTS (contd.)

APPENDIXES	Page
D. Programmed Temperature Speech	105
E. Repetitious Temperature Speech	111
F. Temperature Test and Item Results for Programmed Speeches	117
G. Original Listening Outline	123
H. Listening Purpose Outline	129
I. Traditional Listening Speech	132
J. Listening Programmed Speech with Changes for Revised Programmed Speech	140
K. Repetitive Listening Speech	156
L. Revised Repetitive Listening Speech	164
M. Listening Speech Tests, Partial Item Scores and Relevant Textual Changes	172
N. Semantic Differential Scale	183
O. Test Evaluation Form	186
AUTOBIOGRAPHY	188

TABLES

Table	Page
1. Comparison of Speeches	44
2. Experimental Design	49
3. Comparison of Immediate and Delayed Comprehension Scores among Speech Forms and Speech Topics	53
4. Statistical Differences between Programmed Forms and Speech Topics on Immediate and Delayed Recall Comprehension Tests	54
5. Impact of Speakers	58
6. Manuscript Changes	65
7. Comparison of Immediate and Delayed Comprehension Scores among Speech Forms and between Experiments	74
8. Statistical Differences between Speech Forms and Experiments	75

ILLUSTRATION

Figure	Page
1. Diagram of Semantic Differential Results	78

CHAPTER I

INTRODUCTION

It is difficult to determine the degree of comprehension that can be expected from informative communication. Lesson plans, instructions to the informative speaker in Speech texts, etc., rarely, if ever, consider the degree to which the proposed techniques will be effective. From this omission one might assume that if recommended techniques are exploited fully, total comprehension will result.

Recently extensive studies of total comprehension have been developed in the area of programmed learning. Research which deals with informative speaking techniques compares different speech forms, and frequently demonstrates differences in effectiveness, but does not produce models which result in total comprehension.

One problem considered in this study is the applicability of principles of programmed learning to the lecture. Such transfer, if useful, is much more closely related to the concerns of informative speaking than to the studies of programmed learning since conditions of the lecture prevent the precise duplication of programmed learning

conditions. Programmed instruction requires conditions under which a student individually or in a group responds to a program of instruction. Whether the subjects work alone or in groups, they interact directly and individually with the program. It is this characteristic which permits programmed instruction to provide reinforcement adjusted to individual learning speeds and perhaps to individual learning patterns. The lecture situation requires the programmer (lecturer) to interact with a group as a group. It requires all members of the audience to participate in or observe any individual interactions between the audience and the lecturer. Thus the degree to which responses and reinforcement can be structured, the presence of uncontrolled audience interaction, and the necessity of attempting to move a group instead of single individuals are all quite different from those which a machine programmer must consider. To the degree the principles of programming can be applied to lectures, the theory of informative speaking is broadened. To the degree they fail to be useful, insight into the unique features of the lecture situation should result.

A second problem area of this study is the development of nearly total comprehension from a single speech. Presumably the principles of programmed learning increase the chance of developing such a speech since one claim of programmed devices is nearly total comprehension.¹

¹Thomas F. Gilbert, "Mathetics: The Technology of Education," The Journal of Mathetics. January, 1962, p. 8.

Presumably other variables are also involved. However, it appears that, if informative messages which produce nearly total comprehension could be developed, two benefits would result.

A detailed statement of the methods used should indicate variables to emphasize when there is a need to accurately predict what a whole audience is comprehending. Thus a contribution to the theory of informative speaking should result.

The speech which produced nearly total comprehension would provide an experimental tool for evaluation of other speech techniques in a different and more tightly controlled manner than speeches with less than nearly total comprehension. The former provides a stimulus with a small range of scores on the whole message as well as a small range on each item. The effects of changing the conditions of the communications can thus be more specifically described than in the case of messages with more varied results.

Three general purposes directed this research. Most important is an attempt to determine the effect of techniques of programmed learning upon the informative lecture. Because of the nature of the lecture situation, not all the essential characteristics can be applied to it. The concern here is for those elements which can be directly transferred from a programmed situation to a lecture situation. The second purpose is to obtain suggestive data on related variables involved in high comprehension lectures. Third, programmed lecture which obtains 90% comprehension was attempted in this study. The subject matter chosen is consistent with the types of topics presented in a speech class and

of a length which permits testing during a normal class period. These are conditions frequently relevant to experimental research in Speech. Hopefully the speech thus developed will be useful in continued research on high comprehension messages.

Theoretic Considerations

Programmed learning is frequently called technology. It is argued by individual programmers that they are applying a system of theory (one or more learning theories) to a particular instructional task. For example, Skinner, Holland and Gilbert explain their programs and programming system in relation to the theory of operant conditioning and defend program characteristics on a theoretical basis.²

²B. F. Skinner, "The Science of Learning and the Art of Teaching," Harvard Education Review, 24:86-97, Spring, 1954; B. F. Skinner, "The Programming of Verbal Knowledge," Automatic Teaching; The State of the Art. (ed.) E. H. Galanter. (New York: John Wiley & Sons, 1954.) p. 68-96; B. F. Skinner and J. G. Holland, "The Use of Teaching Machines in College Instruction," Teaching Machines and Programmed Learning: A Source Book. (ed.) A. A. Lunsdaine, (Washington, D. C., National Education Association) 1960, p. 159-172; and Gilbert, op. cit., pp. 7-74.

However, evidence cited below indicates that the relation between any given program and its presumed theoretic background is subject to serious question. While none of the literature reviewed characterized systems of programming as inventions, the position taken here is that such characterization is accurate and that the distinction is important to research which relates programming to speech processes.

Webster defines "invention" as a "device, contrivance, or the

like, originated after study and experiment."³ If programmed learning

³Webster's New World Dictionary of the American Language. (New York: The World Publishing Co., 1958), p. 769.

is viewed as an invention, explanations of the effects of programmed learning are freed from the confines of learning theories. This is not to suggest that learning theories are inapplicable. They undoubtedly are. It does suggest that other theoretic considerations may be equally relevant and that the violation of some aspects of a particular learning theory may not restrict the educational results of a given program. The following analysis begins with a discussion of systems of programming as inventions which may be related to learning theories, but which are not technologies systematically applying learning theories to particular situations.

The first system of programming was developed in the form of automatic testing devices by Pressey. He clearly traces the process by which he decides that the testing device is also a learning device. He noticed learning, recognized possible implications for teaching, began developing more devices and specific hypotheses, and related the results to theory.⁴ The Pressey Tab machines and self-testing devices

⁴S. L. Pressey, "A Simple Apparatus Which Gives Tests and Scores - and Teaches," Lumsdaine, *op. cit.*, pp. 35-41, and "A Third and Fourth Contribution Toward the Coming 'Industrial Revolution' in Education," Lumsdaine, *ibid.*, pp. 47-51.

are therefore inventions.

In 1962 Schramm claimed that 95% of the existing programs were based on Skinner's system of linear programming.⁵ The literature

⁵Wilbur Schramm, Programmed Instruction, Today and Tomorrow. (Washington, D. C., Fund for the Advancement of Education, 1962) p. 8.

about programming frequently refers to Skinner's theoretic work in learning and theoretic explanations of his programs. Yet there is serious doubt as to whether or not subjects of the Skinnerian programs learn for the reasons he and his colleagues assert that they learn. For example, Hessert discovered that linear systems seemed to produce results very similar to other programming systems. Since Hessert works with Skinner, his conclusion probably isn't biased against the linear system.⁶ After a comparison of seven methods of

⁶Ibid., p. 13.

programming a linear sequence, Roe also concluded that there is no presumption in favor of Skinner's interpretation. Instead, Roe argues that "the important variable is the program of instruction, and if this has been carefully conceived, then the particular method of presenting the program does not significantly influence the level of student performance."⁷

⁷Arnold Roe, et al., Automated Teaching Method Using Linear Programs. Department of Engineering, Report No. 60-105. (Los Angeles University of California, Dec. 1960) p. 12.

Crowder's system of "intrinsic" or "branched" programming accounts

for most of the existing non-linear programs.⁸ Accounts of the actual

⁸ Norman A. Crowder, "Automatic Tutoring by Intrinsic Programming," Lumsdaine, op. cit., pp. 286-298. Gordon Pask, "Adaptive Teaching with Adaptive Machines," Lumsdaine, Ibid., pp. 349-366, Robert Glaser, Lloyd E. Homme, and J. L. Evans, "An Evaluation of Textbooks in Terms of Learning Principles," Lumsdaine, Ibid., pp. 437-445.

development of these programs indicate that whatever "application of theory" is involved, it is restricted to the development of the initial program. Revisions are based on "study and experiment" rather than careful theoretic deductions.

Gagne and Schramm developed a system which permits the learner to discover the conclusion which is the object of the program. While the system is original, the authors make no claim to the application of a theoretic system in its development.

After a particularly complete review of the literature, Schramm makes the following general judgment.

The fact that Pavlovian or classical conditioning involves different manipulation from Skinner's operant conditioning, or that Guthrie's contiguity learning represents a somewhat different theory from Hull's drive-reduction or Thorndike's and Skinner's reinforcement theories, is a less important distinction than might be expected, in view of how "Skinnerian" programs are actually written, and what present-day research finds concerning the effectiveness of different⁹ forms of response and reinforcement in a verbal program.

⁹ Schramm, op. cit., p. 57.

This view of programming as invention rather than technology holds important implications for a study such as this one. With this view, there is no necessary reason for the lecturer to hesitate to

use one element of programming and not another. Sequencing, as the term is used in programmed learning, does not exist in the experimental materials of this study. As a result, the principles of programmed learning applied to the lecture in this study can be adopted much more simply and economically than could a whole programming system.

The second implication is that the informative speaker cannot necessarily generalize about the effects of transferring one or more elements of programmed learning to the lecture form. While a study of theoretic systems presumably underlying programmed learning effects are surely a fertile source of hypotheses about what might be expected in the lecture situation, neither the theory nor the programmed learning effects can be expected to directly transfer.

Third, systems of programming are concerned with accomplishing the whole learning task. It may well be that for purposes of informative speaking some aspect of programmed learning can be utilized to perform specialized tasks. For example, single questions with overt responses can be systematically introduced to emphasize details, but not used for general ideas if research should indicate such a practice is better than existing devices of emphasis.

This research effort involves partial programming and the application of programming techniques not necessarily related to any particular program system.

Definition of Terms

Speech Purpose

A critical assumption of this study is that communication is

purposeful. The following definitions rely heavily upon this assumption. All the steps involved in the programming are determined by the purpose outline of the experimental speeches. The comprehension tests are rigidly related to the purpose outline of the experimental speeches.

An informative speech purpose is defined as an explicit statement of all the information and relationships among items of information which the speaker wishes his audience to comprehend. Thus "speech purpose" is defined in terms of a desired effect (comprehension) in relation to given content.

Information

Although the term information is used here, terms such as "ideas," "content," or "meaning," might have been used. In this case informative speech purpose and "information" is taken to include both general ideas and specific facts which the speaker wishes the audience to comprehend.

Information is traditionally defined in a variety of ways. Like other frequently used terms it must be considered in light of the purpose for which it is used. The over-riding problem in this case is that once information is defined, all of it and each part of it must be tested. Thus the purpose of this definition is to provide a means of discriminating between the information in a speech and other statements, material, or content of the speech. Since the purpose is restricted, the definition is an unusually restricted approach to information. There are two parts to the definition.

First, information includes all the sentences of a purpose

outline. Any material not found in the purpose outline is assumed to be material used to increase the comprehension of the information in the outline, but not to be part of the speech information itself.

Second, the basic unit of information is a grammatically simple sentence. Thus all the material in a purpose outline is stated in simple sentences. The amount of information in a speech can thus be quantified by counting the number of simple sentences in the purpose outline. The fact that most, if not all, simple sentences can be expressed in more than one sentence does not weaken the definition since this definition does not involve the difficulty of the information. It does present problems for testing the comprehension of the information. These problems are discussed below.

In summary, "information" is defined as a series of simple sentences in outline form developed prior to speech construction.

Comprehension

The general purpose of informative speech is to produce comprehension and understanding.¹⁰

¹⁰See the discussion of informative speech in Chapter Two, pp. 17-23.

In the Psychological dictionaries consulted, comprehension is a general term. English¹¹ and Warren¹² both define it as "Knowledge

¹¹Horace B. English and Ava Champney English, A Comprehensive Dictionary of Psychological and Psychoanalytic Terms. (New York: Longmans, Green, and Co., 1958), p. 103.

¹²Howard C. Warren, Dictionary of Psychology. (New York: Houghton Mifflin Co., 1923), p. 53.

or understanding of an object, situation, event, or verbal statement."

English amplifies this definition as follows: "fuller and more explicit knowledge of relationships and general principles than apprehension." Warren also makes the term more comprehensive, i.e. "applies to the complete experience of external objects, general principles, etc., in which a thought of their composition, relations, origin, meaning, etc., is added to the direct experience of the datum concerned." Clearly, both definitions deal with internal processes which are complex and involve a large, indefinite number of variables.

For the design used in this study, comprehension is operationally defined as the "correct" response to five-choice multiple choice questions. It is not assumed that there is a complete relationship between the general definition of comprehension and the operational definition. Very probably a large number of the implications of comprehension in general are not measured in multiple choice tests. Nor is it assumed that those elements of comprehension measured by the tests are necessarily the most important aspects of comprehension in general.

It is assumed that whatever capacities are involved in correctly answering the tests also are involved in general comprehension. It is further assumed that whatever is involved in correctly answering the tests is simpler than the process of transferring the

the information outside the communication situation. Therefore, if the tests are not answered correctly, the information is probably not transferred as a result of this communication. The reverse does not hold true.

"Nearly" total comprehension is simply defined as 90% correct answers on the multiple choice tests.

Programmed Learning

Definitions and discussions of the nature of programmed learning are discussed in the following chapter. The following definition does not appear to contradict traditional uses of the term.

Programmed learning or "programming" demonstrates five techniques which are highly controlled. Programmed learning is identified by the degree to which control is exerted, not by the kind of control exerted over message effects.

(1) Programmed learning conforms to a highly structured and specific statement of purpose. One of the identifying features of programmed learning devices is the definition of purpose in terms of overt behavior. The programmer is then responsible to produce the purpose behavior; no more and no less. For this study a "structured specific purpose" is operationally defined as the correct response to a multiple choice test over the content of the purpose outline. The purpose outline is different from the traditional statement of informative speaking purposes in that the resulting communication makes no claims to do anything besides obtain high comprehension scores. This concept is less distinct than the following concepts.

(2) Programmed learning includes stimuli which call for specific,

predictable, overt audience response. Speech normally involves stimuli which call for the production of some form of response. These are two distinctive features of the programmed stimuli calling for a response. (1) The programmed stimulus must communicate the expectation of an overt response. The audience must realize that a covert response is not adequate. They are expected to do something. For this study programmed stimuli include instructions, questions, and in some cases, the names of the people who were to respond. (2) The stimulus must communicate to the audience that a particular kind of response is expected; i.e. a particular statement, a particular mark, action, etc. The responses used in this study are explained below. This is in contrast to the normal speech stimulus which communicates the expectation of a generalized response of understanding, enjoyment, etc., which may or may not be expressed.

(3) Programmed learning involves predictable (controlled) overt responses. Obviously these are the counterpart to the stimuli described above. The identifying features of programmed responses are their overtness and predictability. Note that if the program-speaker asks a question, and obtains an answer, but has not predicted or "controlled" the answer, he has not obtained a programmed response. An equally important distinction is that the respondent and the general audience must be able to relate the programmed response to the programmed stimulus. The program-lecturer, who manipulates a response which the subject does not consciously recognize, has not obtained a

programmed response by this definition. The social nature of speech and the presence of an audience introduces complications into the application of both the programmed stimulus and response. In this study programmed responses included vocal answers to questions by the audience in unison and vocal answers by randomly selected members of the audience.

(3) Programmed learning involves overt, recognized reinforcement for the programmed responses. Reinforcement involves a positive or negative response by the communicator consistent with the "correctness" or "incorrectness" of the response by the subject. For this study reinforcement involved two steps: (1) the attempt to establish motivation for the subjects so they wanted to respond consistently with the message, (2) a statement by the communicator of the correctness or incorrectness of a programmed response. Again, the existence of a group in a speech situation makes the first step more complex than it is for a programmed machine.

General Plan of the Study

As the review of the literature indicates, there is little previous study of attempts to transfer principles of programmed learning directly to speech situations. For this reason, this study is necessarily exploratory. It was assumed that to be efficient, exploratory research should obtain data on a relatively large number of variables to determine which, if any, areas are worthy of more intensive study. Therefore, this study develops suggestive data concerning three different programming forms, eight stylistic variables,

across two speech topics, with two speakers using subjects in two universities. It involves four testing devices to estimate differences in subject attitude and comprehension resulting from the experimental instruments. The large number of variables was included with the realization that because of their quantity, the reliability of any one set of information would be seriously reduced; but the reliability of judgment about future research would be markedly enhanced. To increase the information concerning the central variable of programmed lecture forms, two experiments were involved. The second experiment replicated the first in respect to this variable.

Two experiments were involved in this study. There were five purposes for the first experiment: (1) to develop three methods of programming lectures for use before a group audience, (2) to compare the effects of the methods on audience comprehension, (3) to compare the effects of the programming techniques with traditional informative speech on comprehension, (4) to determine the effects of the methods on two dissimilar speech topics, and (5) to discover if differential effects occur when the programmed forms were used by two different speakers. The procedure for this stage involved three general steps. Material for two programmed speeches was abstracted from two informative speeches previously used for research in informative speaking. Two speeches were programmed in three different ways. The different programmed forms of both speeches were compared experimentally in a design involving two speakers and immediate and delayed recall tests.

The second experiment had four purposes: (1) to evaluate two

kinds of refinement techniques of programming, (2) to evaluate the effects of stylistic changes in the test and text on comprehension scores, (3) to evaluate audience attitude toward the experimental forms, and (4) to replicate the essential features of the first experiment. This experiment involved revision of the text and test of one of the speeches. Two measuring instruments were added to evaluate the attitudinal effects of the different speech forms.

Chapter Two contains a review of the theory of informative speaking described in speech texts and of related research in programmed learning. Chapters Three and Four report the first and second experiments respectively; the purposes, procedures, results, and conclusions. Chapter Five summarizes the study and briefly considers its implications.

CHAPTER II

REVIEW OF THE LITERATURE

Two general areas of research are reported. The text book theory of Informative Speaking is considered first. Then material in the area of programmed learning is described.

Informative Speech

Divisions and types of speech may not be considered essential to speech theory. While texts exist on expository writing and on technical reports, no texts were found which dealt wholly with informative speaking. Furthermore, texts dealing with public speaking and its principles do not always include a section on types of speech. Sometimes they take the position that an understanding of general principles and processes provides an adequate theoretic background for all types of speech situations.

Yet a large and important number of writers in speech do consider types of speech important and include informative speaking as one of the distinguishable types.

Campbell is generally credited with being the originator of informative speaking as a special category. He lists four effects which

can be obtained through eloquence. The first listed is enlightenment of the understanding. Campbell believes that:

When a speaker addresseth himself to the understanding, he proposes the instruction of his hearers, and that, either by explaining some doctrine unknown, or not distinctly comprehended by them, or by proving some position disbelieved or doubted by them. - In other words, he proposes either to dispel ignorance or to vanquish error. . . . Accordingly the predominant quality . . . is perspicuity. . . .

¹George Campbell, The Philosophy of Rhetoric. (London: William Tegg & Co., 1850), p. 2.

In modern texts authors who include informative speaking vary to some degree on the material included, but generally agree on the definition of the term and on the important principles to be followed.

Informative speaking can be characterized as an "attempt to secure understanding"² or to "elicit understanding and encourage

²Alan H. Monroe, Principles and Types of Speech. (New York: Scott, Foresman and Co., 1955), p. 388.

retention"³ or as "Teaching and learning - the educative process."⁴ In

³Giles W. Gray and Waldo W. Braden, Public Speaking: Principles and Practice. (New York: Harper & Row, 1963), p. 337.

⁴Craig Baird and Franklin H. Knowler, General Speech: An Introduction. (New York: McGraw-Hill Book Co., Inc., 1963), p. 235.

each case it is clear that the authors are concerned with the broad definition of comprehension or understanding as developed in

Chapter One and not with the narrow operational definition given there.

Definition of informative speaking is frequently developed with statements of characteristics of the speaker and his content.

Informative speaking is described as the presentation of information objectively, accurately, thoroughly, and in a manner of value to the audience.⁵ In all cases emphasis is placed on precision and objectivity.

⁵Lester Thonssen and Ross Scanlan, Speech Preparation and Delivery. (New York: J. B. Lippincott Co., 1942), p. 94; Robert T. Oliver, Dallas C. Dickey, Harold P. Zelko, Communicative Speech. (New York: The Dryden Press, 1958), pp. 270-271; and Gray and Braden, op. cit.... p. 337-338.

Much of the emphasis in chapters on informative speaking is directly related to the characteristics of programmed learning listed in Chapter One. However, only one textbook was found which mentioned programmed instruction per se as having relevance for informative communication. Baird and Knowler list five recommendations derived from a conference on the use of teaching machines.

- (1) Break down the learning into tiny steps leading from what students already know to what you want them to know.
- (2) Have them do something.
- (3) Don't let them make mistakes - keep the steps tiny and if necessary use clues.
- (4) If they do make a mistake, have them correct it immediately.
- (5) If they get the answer right, reinforce immediately by letting them know that they got it right and by giving them another problem.⁶

⁶Baird and Knowler, op. cit., pp. 235-236.

The characteristics of programmed learning described in Chapter

One shall be reconsidered here in relation to the theory of informative speaking.

The first characteristic of programmed learning was that it conforms to a highly structured and specific statement of purpose. In programming, the purpose of this characteristic is to provide logical method of moving a student from existing behaviors (or ideas) to new behaviors (or ideas). Textbook treatments of informative speaking emphasize the need to deal with specific information in logically consistent manners in order to move the audience from the known to the unknown. Thonssen and Scanlan provide five typical sequence for such organization: operational sequence, definitional analysis, descriptive analysis, historical analysis, and critical evaluation.⁷

⁷Thonssen and Scanlan, op. cit., pp. 98-102.

Baird and Knower present four types of informative speaking which are similar to the methods of organizing informative material listed in other texts. Their types include description, explanation, critical interpretation, and reports.⁸ Other authors include similar categories

⁸Baird and Knower, op. cit., p. 236.

in chapters on organization without making the distinction between types of exposition and organizational patterns. The distinction seems useful and logical. However, the point relevant to this discussion is

that the usefulness of carefully structured information is recognized by informative speaking theory.

The second and third characteristics of programmed learning dealt with the elicitation of overt, predictable audience response. To the degree these characteristics are considered by informative speech theory, they seem to be considered together. The only text discussion of informative speaking which specifically emphasized the need for overt audience response was from Gray's and Braden's text. One of their principles for informative speakers was to "seek questions from listeners."⁹ They advised the speaker to "keep two-way

⁹Gray and Braden, op. cit., p. 350.

communication operating." One of the best ways to judge whether listeners are understanding you is by the questions they ask. By this means you will know what they misunderstand and whether your rate of presentation has been too fast.¹⁰ The importance of active participation

¹⁰Ibid., p. 351.

by the learner is frequently mentioned in chapters on listening which deal specifically with listening to informative speech. For example, Baird and Knower note that profitable listening is active. They admonish the listener to "understand the ideas presented, evaluate and organize them, discover implications they may have, and select

. . . those . . . worth remembering."¹¹ To be involved in these

¹¹Baird and Knowler, op. cit., p. 222-223.

processes certainly requires active, if not overt, audience response.

The final characteristic of programmed learning was overt, recognized reinforcement for the programmed responses. This notion is least frequently considered in informative speaking theory. In his section on motivation Dickens notes the alternatives of penalty and reward for learning. He alludes to teaching machines apparently in noting that "psychologists have found that a student's learning has been increased merely by telling him whether he is right or wrong when he is answering a list of questions."¹² Cullen studied the use of

¹²Milton Dickens, Speech: Dynamic Communication. (New York: Harcourt Brace & World, Inc., 1963), pp. 276-277.

Praise and Reproof in informative speaking and found no difference in their effects on comprehension. All authors emphasize the need for information to be of value to the audience and for informative speaking to explain the value of the information in the introduction or need step. Presumably, explanation of the value of the information continually increases motivation for learning and provides a kind of reinforcement as new ideas are presented and committed to memory or understanding.

In general, the theory of informative speech is consistent with the efforts being made in this study. The differences between present

recommendations and the experimental speeches reported here are differences in degree rather than differences in kind. Each of the programmed characteristics are handled explicitly and overtly.

The principles of programmed learning considered in this study do not require the application of a particular learning theory. They do reflect the molecular analysis of learning common to learning theories. Since theory and the finished program are not necessarily related, a review of learning theories was considered beyond the scope of this study.

Programmed Learning

The following material discusses general descriptions of programmed learning. It also reports experimental research in the area of programmed learning related to informative speaking.

The Nature of Programmed Learning

One sign of the recency of work in programmed learning is the absence from psychological dictionaries of the term or of companion terms such as "program" (in the sense intended here), "programmed instruction," "teaching machine," etc. However, a large number of articles consider the general nature of programmed instruction and generally agree on its components.

Porter defines teaching machine-type devices as:

- . . . devices which endeavor to alter the course of learning by automatically presenting the student with a reward or reinforcement immediately after he has made a correct response
- . . . These devices all possess three operational characteristics:
- (a) they present a sequence of problem materials to the

student; (b) they provide some means by which the student may record his solution to the problems; and (c) they automatically and immediately indicate correctness of the solution.¹³

¹³Douglas Porter, "A Critical Review of a Portion of the Literature," Lumsdaine, op. cit., p.

Feltz defines programmed instruction as any device which can present "systematically programmed materials while making efficient use of the principles of reinforcement."¹⁴ Lumsdaine and Klaus list the elements

¹⁴Virginia G. Sturwold, "Sources of Self-Instructional Devices," Audio-Visual Instruction, (Department of Audio-Visual Instruction, NEA Washington 25, D. C.), 1961, pp. 144-145.

of a program as "the controlled presentation of material, the elicitation of appropriate responses, guidance with respect to the critical aspects of the subject matter, and the control of the way in which learning proceeds "through use of proper sequencing, and related features which seem to be demonstrably important for effective learning."¹⁵

¹⁵Donald Cook and Francis Mechnew, "Fundamentals of Programmed Instruction," in Stuart Margulies and Lewis D. Eigen, (ed.), Applied Programmed Instruction (New York: John Wiley & Sons, Inc., 1962), p. 4.

These general descriptions are then developed into aspects or steps included in the definition of programmed learning presented in Chapter One.

As soon as descriptions of programming become more specific, controversy develops. The nature and degree of disagreement can be seen from a comparison of the two most developed systems of programming:

"linear" and "intrinsic" programming.

Skinner's system of linear programming involves constructed responses, small items normally consisting of no more than two sentences, very low error rate (10% or less), and emphasis on recall. Gilbert has developed an analytic scheme for writing linear programs which claims to insure the use of similar sequences in all programs.¹⁶

¹⁶ Gilbert, op. cit., pp. 7-74.

Crowder's "intrinsic" program system involves multiple-choice items, more material per item, greater error rates, and emphasis on recognition. In "intrinsic" programming, sequences typically vary with the type and frequency of error through branching procedures.¹⁷

¹⁷ Crowder, op. cit., pp. 349-366.

There seems to be no necessary reason for these groups of characteristics to be combined as they are. Programs using constructed answers could be branched. Multiple-choice answers could conform to linear sequencing, etc.

In this study, the general application of programming was considered instead of the application of a particular system. If the general qualities of programming should prove of no value in the lecture situation, further research into particular systems would be less likely to yield useful results. If a single system had been

applied and produced no apparent value, one would still have no information about the efficacy of the other systems.

Experimentation

One example of a "programmed lecturer" was located.¹⁸ It

¹⁸ Arnold Roe, and others, Automated Teaching Methods Using Linear Programs. Department of Engineering, Report No. 60-105. (Los Angeles: University of California, Dec. 1960).

involved a comparison among seven teaching methods; multiple choice teaching machines, free response teaching machines in individual booths, free-response teaching machines in a classroom, programmed textbooks requiring overt responses and providing "correct" answers, programmed textbooks requiring no overt responses, programmed lecturers, and standard lecturers. The programmed lecturers were included in the study as a result of pilot investigation. Two instructors were providing lectures for the "standard lecturer" stimulus. Investigation of recordings of the lectures indicated that the instructors were "performing in anything but a 'normal' manner."¹⁹ Both instructors had worked intensively on the

¹⁹ Ibid., p. 7.

programmed materials for the machines. Both were instructing in the same sequence as the machines and with many of the same words. At this point Roe obtained two other lecturers uninvolved in the

project and retained the two "programmed lecturers" as an experimental variable. As a result of this rather awkward development of the lecturer, operational definition of "programmed lecturer" as used in Roe's study is impossible. As he clearly notes, it is an interesting but imprecise experiment so far as this variable is concerned. Both types of lecturers required less time than any of the programmed methods required. However, there was "no significant indication that any one of the teaching methods is better than another for students of a particular aptitude quarter, either on the basis of criterion test performance or learning time."²⁰

²⁰Ibid., p. 11.

The rest of the experimental work most closely related to this study consists of attempts to program television and film. Here the same problem of group rather than individual response occurs.

Eigen reports a television practice used at the University of Wisconsin and to some degree in the U. S. Army.²¹ Multiple-choice

²¹Lewis D. Eigen, "Pseudo-programmed Instruction Systems," in Stuart Margulies and Lewis D. Eigen (ed.), Applied Programmed Instruction, (New York: John Wiley & Sons, Inc., 1962), pp. 83.

questions are occasionally flashed on a television screen. The audience responds to the questions by pressing the appropriate button in control panels at their seat. In some cases the mean response is

automatically figured and flashed back to the lecturer through a panel in his lectern. The system is reported to be 16 to 40% faster in obtaining the same level of comprehension than normal classroom procedures. No experimental evaluations of the effect of the questions with and without overt responses were available.

Lumsdaine has collected a group of previously unpublished researches dealing with semi-programmed filmed demonstration-lectures.²² Most of the work is connected with government research

²²A. A. Lumsdaine, (ed), Student Response in Programmed Instruction. (Washington, D. C.: National Research Council, National Academy of Sciences, 1961)

concerning training in equipment assembly and repair. However, the experiments deal in variables of programmed learning and, in some cases, are closely related to the variables of this study.

As early as 1947, Lumsdaine, May and Hadsell, and Hovland, Lumsdaine, and Sheffield demonstrated that students subjected to an active-review procedure obtained higher immediate retention than when an equal amount of time was devoted to passive review.²³

²³A. A. Lumsdaine, M. A. May, and R. S. Hadsell, "Do 'Motivation' and 'Participation' Questions Increase Learning?," Educational Screen, May, 1947. This and related research is also reported in C. I. Hovland, A. A. Lumsdaine, and F. D. Sheffield, Experiments on Mass Communication. (Princeton: Princeton University Press, 1949).

Two possible explanations were provided: that the active review guaranteed increased practice of the correct responses or that it increased motivation.

In 1951 Machael and Maccoby attempted to analyze the effects further. They developed data on the relative contributions to learning of "(1) motivation to learn arising from the participation situation itself, and (2) added and emphasized practice during participation sessions."²⁴ Using a civil defense film as a stimulus,

²⁴ Donald N. Machael and Nathan Maccoby, "Factors Influencing the Effects of Student Participation on Verbal Learning from Films: Motivating Versus Practice Effects, 'Feedback,' and Overt Versus Covert Responding," in Lumsdaine, (ed.) op. cit., p. 271.

three factors were manipulated experimentally: overt versus covert response to questions, provision of correct response following covert response and no provision of correct response, and the announcement of a test versus no announcement of a test. Eight experimental groups represented all eight possible combinations of the three factors. Four groups provided controls. A total of 1,029 subjects were used. "During each participation session, half of the thirty final test items covering the previous section of film were specifically practiced, and half of them were not. This procedure was followed for all combinations of the other factors for all experimental treatments."

Since the conclusions are closely related to the variables of this study they are quoted at length:

1 . . . audience participation procedures utilizing either overt or covert practice, when the participants had knowledge of the correct responses, were found to result in considerable improvement in the learning of

verbal material over that resulting from simply viewing the film. Even without the provision of the correct response, participation appears to result in better performance than no participation. This increase in learning seems to be due primarily to the effects of practice and not to the effects of changes in motivation to learn.

2. The most important factor influencing the amount of learning in this experiment was the provision of knowledge of the correct response after practice. This applied to both overt- and covert-practice conditions, and to both the more intelligent and less intelligent participants.

3. There was no significant difference between the level of learning achieved with overt practice as compared to covert practice. An unsuccessful attempt was made to provide two levels of extrinsic motivation by informing some subjects of a test to follow the film and not informing others; no significant differences were found.²⁵

²⁵Ibid., pp. 289-290.

This work was continued by Maccoby, Michael, and Levine in two experiments which partially replicated the earlier ones and contrasted rote learning to meaningful learning and "preview" questions to "review" questions. Results were consistent with those reported above. Three new conclusions were developed:

When "review" questions were asked in participation sessions, referring to the preceding section of the film and with the correct answer given by the instructor after the trainees had thought about each question, the post-film test scores showed a significant increase in learning as compared with the scores of the "film-only" condition. The "covert" or mental-participation sessions were not found to be effective, however, when the correct answers were not supplied by the instructor after the students had responded. Incomplete but suggestive evidence was obtained that "preview"-participation

question (preceding the relevant sections of film) may result in some increase in learning as compared with straight film showing.²⁶

²⁶Nathan Maccoby, Donald N. Michael, and Seymour Levine, "Further Studies of Student Participation Procedures in Film Instruction: Review and Preview Covert Practice, and Motivational Interactions," in Lumsdaine, (ed.) *op. cit.*, p. 309.

While these conclusions are closely related to the types of results reported in Chapters III and IV of this study, the conditions surrounding film presentation differs from the lecture situation in two important ways. Films do not permit immediate interaction between communicator and audience as the lecture situation does. Film utilizes a greater variety of visual symbols and emphasis devices.

Furthermore, both film and television are designed to exercise precise control at great expense, both equipment expense and programming expense. It is assumed that whenever material can be sufficiently controlled, learner response sufficiently predicted, and testing devices sufficiently validated to justify programming television or film the benefit of permitting individual rate justifies the use of machine presentation. The lecture situation is presumably of greater value when these elements do not hold true, or when the material will not be presented before a large enough group or repeated frequently enough to justify the investment in complicated presentation methods. However, these studies do

indicate that less controlled programming systems such as the ones used in this study are capable of increasing comprehension.

Other studies only partly related to this study but involving "whole-audience" response are reported below.

Margolius and Sheffield indicate that when students were allowed to pace themselves with practice efforts they were less effective than when the time and amount of practice was determined by the program and based on the analysis of the task to be performed.²⁷ Additional work on self-pacing was done by Maccoby and

²⁷Garry J. Margolius and Fred D. Sheffield, "Optimum Methods of Combining Practice with Filmed Demonstration in Teaching Complex Response Sequences: Serial Learning of a Geometric-Construction Task," in Lumsdaine, (ed.) op. cit., pp. 33-54.

Sheffield. They concluded that probably the greatest advantage in self-pacing procedures rests in individual differences in "personal demonstration-assimilation spans (memory spans). If the learner could accurately assess when he had 'seen enough', he could stop the demonstration and shift to overt practice at points appropriate to his own ability level."²⁸ These studies directly relate to the

²⁸Nathan Maccoby and Fred D. Sheffield, "Combining Practice with Demonstration in Teaching Complex Sequences: Summary and Interpretation," in Lumsdaine, op. cit., p. 81.

normal lecture situation in which the instructor expects students to "ask questions" when they are uncertain of a point. Such a practice is a self-pacing procedure.

Research in the area of programmed learning reflects several

lively issues regarding the proper size of learning steps, the most efficient form of overt response, the relative efficiency of types of programs and other forms of instruction, the proper size of a whole program, etc. These issues bear only a tangential relationship to this study since decisions concerning these matters for this study were arbitrary insofar as programming "theory" is concerned. The decisions in this case were based upon an attempt to make maximum use of programming principles in a short speech unit, problems of research design, and convenience.

CHAPTER III

THE STUDY OF TWO PROGRAMMED LECTURES

This chapter deals with the first experiment of this study. There were five general purposes: (1) to develop three methods of programming lectures; (2) to compare the effects of the methods on audience comprehension; (3) to compare programming techniques with traditional informative speeches on comprehension; (4) to determine the effects of the methods on two dissimilar speech topics; and (5) to discover if differential effects occurred when the program forms were used by two different speakers.

The Experimental Stimuli

In this section the selection of lecture material, the development of the purpose outline, the development of programmed lectures, and the validation of the programmed and traditional speeches are discussed.

Selection of Lecture Material. Material for two lectures was selected in accordance with two goals: (1) to permit an estimate of the degree to which programming produced similar results when applied to dissimilar material; (2) to permit comparison

of the effects of programmed speeches with traditional informative speeches.

The material selected was taken from two speeches previously used in research on informative speaking at Ohio State. One unit of material came from Phillip's speech on temperature and weather used by him in 1941, and used again by Koeppel in 1942 and by Cassambra in 1962.¹ The second unit came from Kibler's "easy"

¹Alejandro Cassambre, The Effects of Certain Variables in Informative Speaking on Listener Comprehension. Doctoral dissertation, The Ohio State University, 1962.

speech on Listening used by him in 1962.²

²Robert Kibler, The Impact of Message Style and Channel In Communication. Doctoral dissertation, The Ohio State University, 1962.

The selection of these speeches served to provide valid traditional informative speeches in three ways. First, the speeches had been validated as effective applications of informative speech principles independently of this study and independently of each other. Their results were generally consistent with previous studies of informative speaking. Thus they provided an objective, validated stimulus for comparison.

Second, these speeches provided a form of traditional informative speaking unbiased by the involvement of the author in techniques of programmed learning. While the long list of traditional principles

for effective informative speaking places many restrictions on the alternatives of a speaker, they do not dictate his speech manuscript. Given the same detailed speech purposes, audience, situation, and time, different speakers could conform to the same principles and produce markedly different speeches. Thus the use of two manuscripts developed by two different speakers, neither being this researcher, provided an important check on the comparisons between programmed and traditional speeches. Finally, these speeches had recently been presented to similar audiences in similar circumstances as those used in this study. As with this study, Cassambra and Kibler had drawn subjects from the basic speech classes at The Ohio State University. This similarity increases the likelihood that differences in results do not occur by chance. Both Philip's and Kibler's speeches were presented in slightly revised versions in this study as controls.

These selections of material permitted an estimate of the degree to which programming produces similar results when applied to dissimilar material. While there is an indefinite number of ways that speech topics may differ, these two topics differed in four important ways.

Audience familiarity with the materials varied. The listening material was generally unfamiliar to the audience since it involved studies normally not part of classroom work. However, Cassambra found that the temperature material ranged from quite unfamiliar to

quite familiar for similar groups at The Ohio State University.

The temperature material was readily recognized as the kind of information appropriate to academic study; the listening material dealt with a subject generally unexpected in a college classroom.

Both speeches were given in Speech classes. The temperature subject was not necessarily appropriate to the speech class situation. The listening speech dealt with material which is frequently and logically part of a Speech class. This difference is not inconsistent with the previous one. Although Listening is consistent with Speech, it is not normally anticipated by college students as a unit to be included in a Speech course.

The temperature material did not directly and immediately relate to audience behavior. Potentially, the audience could apply the listening material immediately in a large number of situations.

To facilitate the experimental design, the two sets of material were similar in two important ways. They were both judged to be readily comprehensible to college level students, and they both were presented in "easy" speech style. Information on the comprehensibility of the message is presented below.

Material was arbitrarily limited to sufficient information to provide a thirty-item multiple choice test. This limitation constituted a compromise between a speech short enough to enhance the likelihood of obtaining the desired comprehension level and to permit development of a reliable test of their impact. The first criterion was met more satisfactorily than the second.

Developing the Purpose Outline. The goal of this step was to develop a purpose outline containing all the information to be communicated in the experimental speeches. As indicated in the definitions of speech purpose and information, the final outline meets three traditional criteria. (1) Each item is a single, grammatically simple sentence. (2) All sentences at a given level of generality under a given heading have parallel structure. (3) The outline is logically consistent.

Both traditional speeches were comprehensively outlined in their original sequence. This procedure produced a form which differed markedly from the criteria listed above. Material was then extracted which could be stated in the purpose outline. The extracted material was formed into an outline which met the three criteria listed above. Appendixes A, B, C, D, E, G, H, I, J, K, L have the original outlines and manuscripts and the experimental purpose outlines and manuscripts of both speeches. Major changes in sequence and content are indicated below. The manuscript appendixes indicate all changes made.

The Listening speech remained relatively unchanged. With one exception, the material in the introduction and in the first and second main points was retained in Kibler's order. That exception was the material concerning the lack of training in listening. The idea that training in listening is inadequate does not seem to be necessarily related to the main idea that listening should be trained to be effective. This material was therefore excluded from the purpose outline.

The material under the third point (recommendations to listeners)

was found to be logically inadequate for programming purposes. Material under points A, B, and E. over-lap, as do material in points C and D. The material in points B4, C1, E2, E3a, E3b, E3c, and E3d are either not related to the main point or are weakly related. The purpose outline indicates major revision of this unit of information.

The purpose outline of the temperature speech was much shorter than the outline of the original form. The original temperature speech was designed to be an interesting factual statement about temperature and weather. It was not highly structured, nor did it need to be for its original purpose. In the purpose outline for the programmed form, more than half the facts were left out. Information selected came predominately from the second half of the speech on indoor temperature control. Material on relative humidity and on circulation relevant to indoor conditions was also selected. The result was a speech on "Indoor Weather" predominately concerned with indoor temperature. Most of the material was taken from a unit small enough to retain most of the original speech phrasing in the "Traditional Speech" control form.

Programming the Experimental Speeches

The first experimental stimulus was designed to meet four criteria: (1) It was to use all the material stated in the purpose outline in the order of the outline. (2) It was to retain the principles of informative speech as they were expressed in the

original traditional speech form within the limits of the programming techniques. (3) It was to reflect the insertion of three programming techniques.

The first two criteria were met primarily by using the original material in the traditional speech which pertained to the ideas in the purpose outline. Wherever possible the original speeches were used in the revised portions. Where this was impossible because of the nature of the purpose outline, the first criterion was met by the use of as many of the same sentences in the programmed speech as possible.

Three programming techniques were inserted into the traditional text. (1) Questions concerning all items of information and questions designed to increase motivation were inserted. (2) Provision was made for overt audience response to the questions. (3) Provision was made for reinforcement of the answer. Positive reinforcement was to be given if the answer was correct, negative reinforcement if the answer was incorrect. All internal summaries were eliminated since the same function was obtained by the programming techniques. Some transitions were deleted. However, at this stage, programming was primarily an additive process.

The three programmed techniques were abolished in four steps. (1) Instructions prepared the audience for the overt responses expected of them. They were told that correct answers would likely improve their test scores. Thus the likelihood that the reinforcement

would be interpreted as "positive" and "negative" in the same way the investigator interpreted them was increased. (2) Questions concerning the tested material were inserted in the text. (3) Overt audience response was provided for in two ways. In one case the whole audience was asked to answer each question in unison as it was asked. Speeches using this form are hereafter referred to as the "unison" speeches. In the second case, individuals in the audience were called upon to respond to the questions. The order of individuals called upon was determined semi-randomly with each individual having a nearly equal chance of being called each time. The experimenter checked the truly random assignment of names against the class roster to determine if any individual had been left out. Individual names which had not occurred were arbitrarily inserted in the list to be called. This form is called the "Random" form. Reinforcement was provided by the speaker's recognition of correct answers with such exclamations as "correct," "check," "right," "O.K." The order and form of these exclamations was not controlled in the hope of preventing awkward, mechanical expression. Incorrect responses were negatively reinforced with a statement of the correct response as indicated in the speech text. Reinforcement occurs immediately after information is presented.

Two speech forms were developed for each topic in addition to the two programmed speeches using unison and random responses. The first form was a semi-programmed speech called the Repetitive Form. The Repetitive Form substituted sentences in place of the questions

and answers in the programmed text. The sentences constituted re-statements of material in the text just as the questions and answers did. The Repetitive Form is semi-programmed in that it is structured and worded exactly like the Unison and Random forms, but lacks the overt student response and reinforcement. It provides an estimate of the effect of the questions and answers on comprehension.

The fourth speech form was the original material from Phillips' and Kibler's speech which covered the material included in the tests for this study. It is designated the Traditional speech and was used to compare traditional informative speaking to programmed speech. Changes between the original traditional speech and the controlled traditional speech used in this study are indicated in previous paragraphs concerning the development of the purpose outline. All speech forms are found in the Appendices.

Validation and Comparison of Speech Forms. The two programmed and one semi-programmed forms are so classified on the basis of construct and face validity. The selection of programming techniques are obtained from theoretic and technical descriptions of programmed materials. Thus it is assumed that if the materials call for overt response and provide for reinforcement, the experimental speeches may be justifiably considered to be "programmed." That such responses are called for is verified by the description of procedures for introducing questions and providing reinforcement. While different programmers would likely produce different questions using these instructions, the existence of questions at the same places in the

text and the existence of questions concerning all the test materials should be insured. Probably the weakest area of validation is the assumption that the "positive" and "negative" reinforcement is viewed "positively" and "negatively" by the subjects. Measures taken to increase this likelihood are described in the previous section. Furthermore, classroom tradition dictates that "correct" answers are desirable; incorrect answers undesirable.

In their original programmed forms, the programmed speeches violated one major principle of informative speech. The questions in the programmed forms and summary statements in the repetitive forms typically reinforce the last thing stated first. For example, in the listening speech different principles are listed. In the summary questions the sixth principle is asked about first, (What was the last principle?) the fifth principle is asked about second, (What principle dealt with the main parts of the speech?) etc. Thus the questions and summary statements violate the original sequence of information in the speech. In a sense this type of review combines recency and primacy.

The four final speech forms were compared on the basis of total word length, Flesch reading ease scores, and time required for delivery. The results of those comparisons are presented in Table I.

Differences in speech size present problems of design. Both the programmed forms and the semi-programmed form contain more words than the traditional form. The difference is largely the result of

TABLE I
COMPARISON OF SPEECH LENGTHS

Speech Form	Words	Flesch Score	Minutes
<u>Listening Speech</u>			
Unison	1897	58.4 Standard	11:10
Random	1897	58.4 Standard	12:50
Repetitive	1852	58.4 Standard	10:04
Traditional	1427	54.5 Standard	10:02
<u>Temperature Speech</u>			
Unison	1125	58.3 Standard	8:01
Random	1125	58.3 Standard	9:45
Repetitive	1082	58.3 Standard	7:40
Traditional	903	74.3 Fairly Easy	6:51

adding questions and answers without removing supports. In the second experiment this difference in wordage is reduced.

The programmed forms took more time as well as more words. It was recognized that if differences between scores occur, they could be a result of length, either by word count or time, as well as the programmed techniques. However, both elements of greater length are inherent in programming. Any instructional device which requires learner response involves a greater expenditure of time than one which does not require learner response. The experimental design permits comparison between programmed speeches and traditional speech without taking time or word length into account. To determine the effect of questions, answers, and reinforcement themselves, the repetitious speech was designed to include as nearly as possible the same number of words as the programmed speeches. Both the traditional and repetitious forms were delivered slowly (143 words per minute) to partially compensate for the time required for learner response.

To the degree that differences in length bias results, they are expected to increase the scores of the programmed forms, since the programmed forms provide more time for learning.

The temperature traditional speech form is rated "easier" by the Flesch scores than are the three programmed forms. This difference results from the fact that the questions, answers, and

repetitions all deal with the tested items, i.e. the "technical" elements in the speeches. The technical material tends to involve the longer words. Thus the syllable count and resulting Flesch scores are reduced and difficulty is increased. To the degree that differences in Flesch scores bias the results, they were expected to decrease the comprehension of the programmed forms.

The Comprehension Test

A five-choice multiple choice test was developed for each of the two speeches to be used for all forms of the speeches. The test was designed to test each sentence of information in the purpose outlines. The items used by Cassambra and Kibler appropriate to the information in the purpose outline were extracted, then edited, as explained below.

A sentence was assumed to be tested if misinformation concerning the sentence would produce an incorrect answer on the test. Appendices B and H show the number of the test question which refers to each sentence in the purpose outline. Some of the main headings in the purpose outline are so closely related to the points sub-named under them that to make separate items in the test resulted in an excessive number of repetitions of choices. In its final form four of the sentences were left out of the listening test and five main headings were left out of the temperature test. Since the sentences left out do not appear to be significantly different

from the sentences tested, it is assumed that the test validity is not appreciably reduced.

A pilot study using fifteen subjects indicated that the split-half test reliabilities of the temperature and listening speech tests were .71 and .69 respectively when corrected for length. Reliability of the tests was calculated again from the experimental data involving 421 subjects. This time the temperature test reliability was .46, the listening test .61. While these correlations are probably conservative, this level of reliability is still disappointing. However, since these tests deal with both concrete and abstract material and since it is a short test, somewhat low reliability could be expected. If the length of the speeches and resulting test had been lengthened to the point of appreciably improving reliability, one of the goals of this study, to produce 90% comprehension, would have been feasible. As the results indicate, even 30 items proved to be excessive. The tests are reproduced in Appendices F and M. Immediate and delayed recall item difficulty for the random, unison, and traditional forms are recorded beside each item.

Hypotheses

An experimental design was developed to use the four speech forms to test the following hypotheses.

I. Recall scores for the groups exposed to the programmed forms will be significantly greater than for the groups exposed to

the traditional forms and the groups exposed to the control test.

II. Recall scores for the groups exposed to the unison and random forms will be significantly greater than the scores of the groups exposed to the repetitive forms.

III. Recall scores for the groups exposed to the unison form and the random form will differ significantly.

IV. Differences among recall scores of groups receiving different forms will not vary with the two different speakers.

V. Programming will produce similar effects or lack of effects when applied to a speech on temperature as when applied to a speech on listening.

Experimental Design and Administration

The four speech forms were presented to 421 students enrolled in eight speech classes at Ohio State University the Winter quarter of 1963. One control group of twenty-nine students received the test on both the listening and temperature speech without hearing any stimulus speech.

The design of the experiment is reproduced in Table II. Each class received one speech form on each speech subject. The order of presentation was rotated such that each speech form was given first as often as second. Similarly speakers were rotated so that each class heard both speakers and each speech form was given half the time by each speaker.

Ideally the design would have permitted all possible combinations

TABLE II
EXPERIMENTAL DESIGN

GROUP	FIRST SPEECH	SECOND SPEECH	
	<u>Speaker - McGlone</u>	<u>Speaker - Tucker</u>	
L			T
1 I	Unison	Unison	E
2 S			M
3 T	Random	Random	P
4 E			E
5 N	Repetition	Repetition	R
6 I			.
7 N	Traditional	Traditional	
8 G			
5 T	Unison	Repetition	L
6 E			I
7 M	Repetition	Random	S
8 P			T
1 E	Random	Traditional	E
2 R			N
3 A	Traditional	Unison	I
4 T			N
5 U			G
6 R			
7 E			

of speakers, topics, speech forms and order. Such a design would have required 25 groups, each used twice for exposure to the speeches and immediate testing and each used once for delayed testing. It seemed both uneconomic and impractical to attempt to obtain such a large number of subjects. Even had the attempt been successful, the likely differences among groups may have produced as many problems as it solved. As a result the final design constitutes a compromise between economic considerations of the availability of subjects and the primary need to compare programming forms. Each form is compared with itself and each programmed form is compared with the traditional and semi-programmed form.

An attempt was made to obtain effective speakers; i.e. speakers whose delivery would be likely to enhance the speech and likely not to detract from it. One speaker was an M.A. candidate in speech and an intercollegiate debater of national repute who had had considerable experience in after-dinner speaking. The second speaker was the author, an ex-debater and a teacher and forensics coach of five years experience. The speakers were rotated throughout this and the following design.

Before each speech subjects were informed that they would receive a test immediately following the speech in order to estimate their listening efficiency. They were promised that the results would be returned along with the average scores of their class and other classes at Ohio State. It is assumed that foreknowledge of the test and the opportunity to compare scores established

a relatively high motivation of the kind typically found in classrooms.³ Instructions for the different speech forms varied to

³Franklin H. Knower, David Phillips, and Fern Keoppel, "Studies in Listening to Informative Speaking," Journal of Abnormal and Social Psychology. 40:82-88, 1945.

accommodate the different expected class response.

The speakers presented the speeches from manuscript after familiarizing themselves with it. Before the experiment they practiced delivering the material in standard time periods. The only conscious differences between delivery of the experimental and traditional speeches was an effort to present the traditional speech slowly and with particular emphasis on the tested items, each of which had been underlined in the text. The selection of experienced speakers supports the assumption that they were capable of using a variety of traditionally effective devices for emphasis.

The tests were administered immediately after the speeches without comment. No time limit was exacted; all subjects completed the tests.

The delayed recall tests were administered three weeks after the speeches. They were unannounced. Scores of the immediate recall tests were not returned to the subjects until after the delayed recall tests were administered. Both delayed recall tests were administered on the same day. They were mixed so that in each

class half the subjects took the listening test first, half took the temperature test first.

Results

Statistical Analysis

The first three hypotheses were tested with the median test. This test combines all the scores of a group into two intervals: the scores above the combined median and the scores below the combined median. As a result the test does not reflect the effects of variance. This insensitivity of the test slightly increases the likelihood that a significant difference between groups will be masked.⁴

⁴Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, (New York: McGraw-Hill, Inc., 1957), pp. 179-184.

The conservative test was used because the quality of the data did not justify use of more sensitive parametric tests. The scores were not normally distributed as a parametric test requires since they were grouped at the upper end of the 30 point scale. For example, medians for immediate recall scores of the random and unison listening speeches were 26 and 25 respectively.

The purposes for the study are consistent with a conservative analysis of results. It is considered exploratory research. To the extent this study provides the basis for additional experimentation, the production of a Type I error would be costly.

Since the first two hypotheses predict direction, one-tailed

TABLE III

COMPARISON OF IMMEDIATE AND DELAYED COMPREHENSION SCORES
AMONG SPEECH FORMS AND SPEECH TOPICS

	Immediate Recall Temperature				Immediate Recall Listening				Delayed Recall Temperature				Delayed Recall Listening			
	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>
Unison	48	24.21	81	3.48	45	22.67	76	3.33	39	18.53	62	4.36	42	18.90	63	4.00
Random	54	25.39	85	3.56	44	24.39	82	2.73	20	20.55	69	3.25	32	20.38	68	4.20
Repetitious	52	24.19	81	5.39	53	22.32	74	3.32	42	19.02	63	5.25	45	17.07	57	3.25
Traditional	59	21.41	71	5.39	66	19.94	66	3.24	57	18.23	61	4.14	52	17.73	59	3.60
Control	29	13.10	47	2.48	29	12.76	43	3.42	26	13.56	45	2.87	27	11.56	39	3.12

"N" refers to the number of subjects

"Mean" refers to the average score out of 30 items

"%" translates the mean score into the per cent of the total possible score

"SD" refers to standard deviation

TABLE IV

STATISTICAL DIFFERENCES BETWEEN PROGRAMMED FORMS AND SPEECH
TOPICS ON IMMEDIATE AND DELAYED RECALL COMPREHENSION TESTS

	UNISON		RANDOM		REPETITIOUS		TRADITIONAL	
	<u>I. R.</u>	<u>D. R.</u>	<u>I. R.</u>	<u>D. R.</u>	<u>I. R.</u>	<u>D. R.</u>	<u>I. R.</u>	<u>D. R.</u>
RAND. X^2	5.00	2.68						
TEMP. p	.03*	.11*	*(two-tailed)					
MD	1.18	2.02						
RAND. X^2	5.52	.78						
LIST. p	.02*	---	*(two-tailed)					
MD	1.72	1.48						
REPET X^2	.36	.24	4.56	1.85				
TEMP. p	.95	.60	.01	.05-				
MD	.02	.49	1.20	1.53				
REPET X^2	---	3.22	5.59	5.42				
LIST. p	---	.01-	.001	.001				
MD	.35	1.83	3.31	4.45				
TRAD. X^2	9.98	.26	19.56	2.11	5.70	.02		
TEMP. p	.01	---	.001	.05	.001	---		
MD	2.80	.30	3.98	2.32	2.78	.79		
TRAD. X^2	6.94	1.08	28.08	4.00	4.38	.73		
LIST. p	.001	----	.001	.01	.01	---		
MD	2.73	1.07	4.45	2.56	2.38	.66		
CONT. X^2	42.16	13.06	42.54	17.73	41.32	14.01	36.76	16.81
TEMP. p	.001	.001	.001	.001	.001	.001	.001	.001
MD	11.11	4.97	2.29	6.99	11.09	5.46	13.54	9.36
CONT. X^2	37.52	17.82	40.00	31.43	35.11	37.06	30.42	29.83
LIST. p	.001	.001	.001	.001	.001	.001	.001	.001
MD	12.92	9.34	14.01	10.82	11.86	7.51	9.52	8.17

"I. R." and "D. R." refer to immediate recall and delayed recall respectively.

" X^2 " refers to the product of the median test.

"p" refers to the statistical probability that the difference between scores occurred solely by chance.

"MD" refers to the difference between means.

tests were used. For hypotheses three, four, and five, two-tailed tests were used.

Results are reported in the order of the original statement of the hypotheses. In this case each hypothesis is restated in its null form. Table II shows the mean scores of each group in terms of the possible score of 30 and in terms of percentages. It also provides standard deviations and the number of subjects in each group. Table III shows the differences between scores of the groups.

Hypothesis I. Recall scores for the groups exposed to the programmed forms will not be significantly greater than for the groups exposed to the traditional forms and the groups exposed to the control test.

On the immediate recall tests the programmed speeches were significantly higher at the .05 level. On the delayed recall tests however, neither the repetitious or unison speech scores were significantly higher than the traditional speech scores. The random temperature speech audience received higher scores at the .05 level.

This null hypothesis was partly rejected.

Apparently all the speeches increased comprehension significantly. The degree of difference between the control and non-control results is as much an indication of test validity as of speech effectiveness. Since the control scores were higher than the control scores reported by Cassambra and Kibler, it is concluded that these tests were easier tests.

Hypothesis II. Recall scores for the groups exposed to the unison and random forms will not be significantly greater than the scores of the groups exposed to the repetitive forms.

The unison temperature speech audience did not obtain significantly higher scores than the repetitious audience.

The unison listening speech audience received higher scores than the repetitious speech audiences. The immediate recall scores were different at the .05 level and the delayed recall scores approached the .05 level.

Both the immediate and delayed scores of the random listening speech audiences were higher than the repetitive listening speech audience above the .001 level.

This null hypothesis was rejected.

Apparently the process of obtaining overt response from audiences increases comprehension particularly for a short time. The differential effects of the technique seem to weaken over time.

Hypothesis III. Recall scores for the groups exposed to the unison form and the random form will not differ significantly.

These differences were tested using two-tail levels of significance.

The random form exceeded the unison form on both the immediate recall tests above the .05 level of confidence. There was no significant difference between delayed recall scores.

This hypothesis was rejected. Apparently whatever is gained by the random form is lost over time.

Hypothesis IV. Differences among recall scores of groups

receiving different forms will not vary with the two different speakers.

Table III provides the mean scores of the two different speakers according to each form and speech subject. Of interest here is not whether one speaker obtained generally higher scores and might therefore be judged a better speaker. This hypothesis is concerned with whether the differences between forms varied between speakers. None of the differences between speakers according to the speech forms approached statistical significance.

This hypothesis is not rejected. Apparently, the different programming techniques did not differentially affect the speakers.

Hypothesis V. Differences in recall scores produced in groups exposed to programmed temperature speeches will not differ significantly from differences in recall scores produced in groups exposed to listening speeches.

The results concerning each of the above hypotheses are stated according to the speech topic involved. If the forms are ranked according to comprehension scores and by topics there is no difference in the ranking; i.e., random, unison, repetitious, and traditional.

The greatest relative difference is the repetitious form in relation to the random form on the immediate recall test. However, none of the statistical comparisons among the subjects produced significant differences. This null hypothesis was not rejected.

These results seem to indicate that for these Ohio

TABLE V
IMPACT OF SPEAKERS

<u>FORM</u>	<u>SPEAKER</u>	<u>TOPIC</u>	<u>N</u>	<u>MEAN</u>	<u>PER CENT</u>
U					
N	McGlone	Temp.	27	23.98	80
I	Tucker	Temp.	21	24.66	82
S					
O	McGlone	List.	21	23.34	78
N	Tucker	List.	24	22.17	74
R					
A	McGlone	Temp.	26	25.19	84
N	Tucker	Temp.	28	25.57	85
D					
O	McGlone	List.	24	24.88	83
M	Tucker	List.	20	23.80	79
R	McGlone	Temp.	21	24.95	83
E	Tucker	Temp.	31	23.67	79
P					
E	McGlone	List.	27	21.26	71
T	Tucker	List.	26	23.08	77
T	McGlone	Temp.	28	21.41	71
R	Tucker	Temp.	31	21.15	70
A					
D	McGlone	List.	35	18.94	63
.	Tucker	List.	31	18.61	62

State University students, the programmed lecture forms increase comprehension when used in an experimental setting. The results do not indicate whether the difference in scores is primarily a matter of time or whether students would cease to find the programming efficient if it were used frequently. Data on the former question is increased in the second phase of the study.

These results indicate that programming can produce increased comprehension across two dissimilar speech topics. Furthermore, the rate of comprehension increase is quite constant across the different topics.

In this case, programming proves of value when used by two different experienced speakers. There is no indication that its effects are increased or decreased when used by inexperienced speakers.

These results provide no information about the degree to which the particular style of this programming effort is responsible for the results obtained. While some indication of student attitude toward the forms was obtained, the measure was so gross it is not reported here. It was obtained to determine the contents of the experiment reported in the next chapter and is reported there.

Finally, the programming effort fell considerably short of the 90% comprehension goal. These three limitations appeared to call for additional experimentation. The next chapter and the

experiment reported there is concerned with reducing these limitations. Extended interpretations of the data is delayed until that experiment is reported.

CHAPTER IV

THE STUDY OF A REVISED PROGRAMMED LECTURE

This experiment involves four purposes.

The first purpose involves the evaluation of two kinds of refinements of programming. The refinements included the increase of subject responses and reinforcements on those items of information obtaining low comprehension scores and deletion of material from the speech texts.

The second purpose was to evaluate the effects of stylistic changes in the test and text on comprehension scores. Both types of changes are classified and described below.

Third, an attempt was made to evaluate audience judgment about the speech forms in two ways. A twenty-six item semantic differential, developed to discriminate between easy and difficult messages, was administered immediately following the immediate recall test. Subjects also estimated the number of errors they had made on the comprehension test.

Finally, the essential features of the first experiment were replicated. In spite of the textual, test, and stylistic changes,

the essential differences between the programmed and traditional forms were retained. Thus similar results in conjunction with the changes on different subjects in a different university would provide greater reliability for general conclusions about the effects of programming. Dissimilar results would limit general conclusions.

The Experimental Stimuli

Selection of the Speech Subject.

A single speech was selected from the two speeches used in the first experiment. The results of that experiment indicated that the effects of programming on the two subjects was similar. Limitation of this experiment to a single subject permitted more intensive revision of the stimulus and the use of larger audiences.

The listening speech was selected for revision. Its delayed recall scores were higher on the original study and the range of scores was less. Furthermore, audience familiarity with the subject seemed less varied. Listening is not as frequently included in the college preparation curricula of high schools as is one or more physical science courses. Cassambra's interviews with similar subjects indicated sufficient variance in background to produce significant differences in scores.¹

¹ Alejandro Cassambra, "The Effects of Certain Variables in Informative Speaking on Listener Comprehension." (Doctoral Dissertation, Ohio State University, 1962), p. 62.

Finally, the Listening subject was selected because of slightly better reliability of the listening text.

Selecting the Experimental Speech Forms. The unison response was rejected for the second experiment. Although comprehension scores for this form were not significantly different than the scores of the random form, audience preference rested against it. Discussions following the experiment indicated the subjects considered the unison response to be mechanical and difficult to follow. They claimed they frequently did not answer the questions asked. Although the repetitious form also rated low, it was retained because it varied so markedly from the completely programmed speech. The repetitious form provided the most accurate indication of the effect of the questions, answers, and reinforcements of the programmed speeches.

Development of the Experimental Speeches. The second experimental speech was based on the scores and attitudes of the audiences in the first experiment. Tabulation of the total errors for each question revealed those questions which did not obtain the desired 90% accuracy. Appendix M provides these results. Critical judgment was applied to the speech content and the test question of each item in an attempt to determine a method by which comprehension could be improved. Class reaction to the speeches was informally discussed.

All changes in the speech manuscript are classified according to the kind of revision made and the reason for the revision. These

revisions and their appropriate categories are indicated in Appendix J.

Table VI shows the number of revisions made by kind and by purpose. Kinds of revisions are symbolized with upper-case letters "A," "R," and "X." "A" refers to additions, "R" to revisions in which addition, deletion, and substitution of words are combined, and "X" refers to deletions.

There were eight reasons for making these changes. These reasons are symbolized with small letters as follows:

(a) Some words were eliminated because they did not directly relate to a test item and did not seem necessary for any other reason. (see d below) It seemed important to eliminate as many words as was feasible for two reasons. Programmed learning is normally developed on the assumption that the contents of a test are all that is involved in a teaching goal. Thus any material which does not promote the retention of tested material or serve some instrumental function such as holding interest or directing the subject for future steps is unnecessary material. This assumption contrasts with the principle of informative speech which dictates that various forms of verbal support be included in a speech to enhance the material to be learned. Frequently supports such as analogy, examples, explanations, etc., do not directly involve the test items to be used later in evaluating learning. To the extent that this study purports to compare programmed speaking with traditional speaking it seems the same

TABLE VI
MANUSCRIPT CHANGES

	DELETIONS X	ADDITIONS A	REVISIONS R	TOTAL
a - irrelevant	9		2	11
b - parallelism	1	2	1	4
c - emphasis		6		6
d - de-emphasis	9		4	13
e - transitions		1	1	2
f - interest			2	2
g - explicitness			3	3
h - consistency			2	2
TOTAL	19	9	15	43

criterion should be used to eliminate material not directly related to test items. Secondly, elimination of words increases the similarity of experimental message length with control message length. As a result the two different forms can be compared somewhat more realistically.

Both revisions (R) and deletions (X) were used for this reason.

(b) "b" refers to a change in the text which increased the parallelism between the text and the test. These changes increased the incidents in which the exact phrasing used in the test was repeated in the speech. It was assumed that this type of change was likely to increase test scores since it permitted a subject to only recognize a phrase in the test to obtain a correct answer in many cases, while in the former manuscript he was more often required to recognize synonyms in the test for statements that had been made in the manuscript. This type of change does not seem to violate the definition of comprehension. Put another way, it permitted more frequent and more accurate rehearsal of the test answer.

This type of change was made with additions, revisions, and deletions.

(c) This letter refers to additions of material to increase emphasis on certain items. In most cases they were new questions calling for an additional response consistent with a frequently missed test item. In some cases they were restatements of frequently

missed items. This type of change involved additions only.

(d) This letter refers to the removal of material on easy items. Most frequently this type of elimination did not involve removal of an exact statement of a test answer. As a result of this category most of the material normally considered to be "speech supports" was eliminated. Enough was retained to permit the subjects some time to learn the item prior to being asked about it. This category is not included under "a" above since it directly relates to traditional principles of informative speech.

This type of change involved deletions and revisions.

(e) This letter refers to two changes in transitions based on audience comments and arbitrary judgment. In neither case did they directly involve a test item.

(f) This letter refers to revisions made to add interest. In both cases they involved revisions which were primarily substitutions.

(g) This letter refers to revisions and additions made to increase explicitness. Since the test permits precise determination of what the subjects should learn, explicitness is easily developed. It was assumed that an explicit statement would be more tangible and therefore more easily remembered.

(h) This letter refers to revisions made in order to retain consistency with previous changes.

In Appendix J manuscripts of both programmed speeches are presented in a way to show every change made. In Appendix M the

final test is duplicated. It shows all changes made from the former test, scores on each test item, and the type and purpose of 19 manuscript changes which directly relate to the test item(s). A total of 21 changes are not recorded on the test because they do not directly relate to a given test item. Seventeen of the unreported changes reduced the number of words.

These changes are no different from other informative speech preparation in that they are largely a matter of judgment and could be expected to vary from programmer to programmer.

Speech Comparisons. One of the goals of the revisions was to reduce the differences in length between the traditional and the programmed speech forms. Comparisons among the speeches are as follows:

	WORDS	FLESCH SCORE	MINUTES
RANDOM	1585	59.90 Standard	11:00
REPETITIOUS	1551	59.90 Standard	9:10
TRADITIONAL	1769	52.45 Standard	10:00

Measuring Instruments

Multiple Choice Tests

The multiple choice test was altered in an attempt to increase its reliability while retaining its validity. The original and revised test can be found in Appendix M.

Validity of the test was evaluated in two ways. Six graduate students were provided with manuscripts of the programmed and the traditional speeches. Each of the students had had at least one course related to tests and measurements and were teaching. Three received the traditional speech forms and three received the

programmed speeches. They completed the test using the manuscript. They applied three point scales to each test item on the basis of difficulty (1 = easy; 3 = difficult), clarity of intent (1 = clear; 3 = unclear), and reasonableness (1 = reasonable; 3 = unreasonable). Of the six students, two made errors; single errors in each case. Questioning and inspection of the manuscript and the freedom from errors for the other students all indicate the errors were a result of carelessness. It was concluded that the test had face validity. The evaluations of the separate items were averaged. The mean score on the difficulty scale was 1.15 with a range from 2.5 to 1. Apparently the test was an easy test from the judgment of these students. The mean score on the "meaningful alternatives" scale was 1.32 with a range from 2.33 to 1. Questions 5, 14, 18, and 23 were judged slightly to the non-meaningful side. As a whole they judged the alternatives meaningful. The mean for the "clarity of intent" scale was 1.40 with a range from 2.43 to 1.00. Apparently items 7, 12, 14, 20, 25, and 29 were the less clear items. In general the test was judged a "clear" test. While those who judged the test using the traditional speech differed somewhat from those who judged the test using the programmed speech, there seemed to be no important differences except for item 26. In this case those receiving the traditional speech were forced to make an inference to obtain the correct answer.

Test reliability was measured using a split-half odd-even

correlation and corrected for length. The reliability was .58. It was also estimated from test re-test correlation. The correlation was .83. The correction can be expected to be conservative and the test - re-test correlation can be expected to be too large. Thus the real reliability of the test probably falls somewhere between the two. Probably one of the reasons for the low split-half reliability correlation is the fact that the scores were all high.

Semantic Differential

A twenty-six item semantic differential developed to test the comprehensibility of messages was appended to the comprehension test. The test had been used in connection with a study of the readability of Air Force technical manuals. Results of that study indicated that the test scores reflected subject attitude toward the general testing situation more than it discriminated among the messages being compared. However, the pilot work using college students for that study and later pilot work done with college students at Ohio State suggested that the instrument does discriminate among messages when the testing situation is not particularly unusual and when there is a major difference in the messages. For this study the Semantic Differential was used to obtain information about both general response to the experimental setting and some indication of differences in student judgment of the different speeches.

Estimated Error

Each student was asked to estimate the number of errors he

made on the comprehension test. The estimate was used to indicate effects of the different forms on student confidence. The fewer errors students estimate that they will obtain, the more confidence they have. If one form produces fewer estimated errors, it will be a form engendering greater confidence. The validity of these interpretations is increased to the degree that there is a negative correlation between the estimated error and the test score. Such a correlation should indicate that the estimated error is a meaningful activity to the subjects; i.e., their estimate is based on reality to some degree. Particularly if the correlation changes from form to form in a manner consistent with the estimate, it will be concluded that the estimated error is an index of student confidence.

Administration

The revised Random, Repetitious, and Traditional speeches were presented to 155 students in speech and political science courses at Capital University. Only one of the classes was a political science class and its enrollment was determined on the same random basis as the speech classes. The test was presented to 30 students as a control.

The speeches were introduced, presented, and the test administered in the same manner used in Experiment I. The same speakers alternated in their presentations such that each speaker presented each form at least once and to approximately half the subjects.

The delayed recall test was again administered without

warning. This time a delay of four weeks was provided to determine if differences among the forms increased or decreased over greater time.

Hypotheses

The following hypotheses, similar to those used in Experiment I were tested.

I. Immediate and delayed recall scores of the groups exposed to programmed forms (random and repetitious) will exceed those of the group exposed to the traditional form and the control test.

II. Recall scores of the groups exposed to the random form will be higher than of the group exposed to the repetitious form.

III. Semantic Differential scores of the groups exposed to the different speech forms will differ.

IV. The estimated errors of groups exposed to the different speech forms will differ significantly.

V. Groups exposed to the revised programmed speech forms and the revised test will obtain scores higher than the groups exposed to the original speeches and tests.

Results

Analyses of Results

Differences among the comprehension scores of groups were analyzed statistically with the Median test. The same rationale

used in Chapter 3 applied. Differences between the means of the estimated error were tested with the unrelated "A" test.

The correlation between estimated error and comprehension scores was evaluated by use of the Pierson Product Moment Correlation. Only immediate recall scores and the estimated error were correlated, on the assumption that the correlation would not vary greatly between immediate and delayed scores.

Effects of the revisions are analyzed on the basis of differences in mean scores plus item difficulty of the tests on both experiments. The immediate recall item difficulty of each test on each treatment for both experiments was calculated and recorded. Differences in scores by treatment and by experiment were roughly compared. Differences in scores according to the type of stylistic change were also roughly compared. These types of data were too imprecise to permit useful statistical analysis.

Table VII presents the means and standard deviations of scores for both experiments, Table VIII presents differences between forms and between experiments.

I. Recall scores of the groups exposed to the programmed forms (random and repetitive) will be no higher than scores of the groups exposed to the traditional forms or the control tests.

Immediate recall scores were significantly higher above the .001 level in all cases. For immediate recall this hypothesis is rejected.

Delayed recall scores of the programmed speeches were higher

TABLE VII
COMPARISON OF IMMEDIATE AND DELAYED COMPREHENSION SCORES
AMONG SPEECH FORMS AND BETWEEN EXPERIMENTS

	Immediate Recall Experiment I				Immediate Recall Experiment II				Delayed Recall Experiment I				Delayed Recall Experiment II			
	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>	<u>N</u>	<u>Mean</u>	<u>%</u>	<u>SD</u>
Random	44	24.39	82	2.73	46	25.83	86	2.95	32	20.38	68	4.20	34	20.53	68	4.38
Repetitious	53	22.32	74	3.32	56	26.09	87	2.37	45	17.07	57	3.25	45	21.04	70	2.88
Traditional	66	19.94	66	3.24	53	21.89	73	3.13	52	17.73	59	3.60	49	19.04	64	5.23
Control	29	12.76	43	3.42	30	12.47	42	3.69	27	11.56	39	3.12	28	11.68	39	4.24

"N" refers to the number of subjects.

"Mean" refers to the average score out of 30 items.

"%" translates the mean score into the per cent of the total possible score.

"SD" refers to standard deviation.

TABLE VIII

STATISTICAL DIFFERENCES BETWEEN
SPEECH FORMS AND EXPERIMENTS

		RANDOM		REPETITIOUS		TRADITIONAL		CONTROL	
		<u>I. R.</u>	<u>D. R.</u>	<u>I. R.</u>	<u>D. R.</u>	<u>I. R.</u>	<u>D. R.</u>	<u>I. R.</u>	<u>D. R.</u>
RANDOM	X ²	2.13	.00						
	p	.12	---						
	MD	1.44	.15						
REPET.	X ²	5.59	5.42	15.70	16.74				
EXP. I	p	.001	.001	.001	.001				
	MD	2.07	3.31	4.23	3.97				
REPET.	X ²	.18	.62						
EXP. II	p	.90	.80						
	MD	-.26	-.26						
TRAD.	X ²	28.08	4.00	4.38	.79	2.42	.46		
EXP. I	p	.001	.01	.01	---	.12	---		
	MD	4.45	2.56	2.38	.73	1.95	1.31		
TRAD.	X ²	20.06	1.78	38.72	3.86				
EXP. II	p	.001	.20	.001	.01				
	MD	3.94	1.49	4.20	2.00				
CONT.	X ²	40.00	31.43	35.11	37.06	30.42	29.83	IR vs. DR	
EXP. I	p	.001	.001	.001	.001	.001	.001	.19	
	MD	14.01	10.82	11.86	7.51	9.42	8.17	---	
CONT.	X ²	55.00	27.06	34.40	36.32	45.00	31.60		
EXP. II	p	.001	.001	.001	.001	.001	.001		
	MD	13.36	8.85	13.54	9.36	9.42	8.36		

Entries comparing treatments with themselves relate experiment I with experiment II and appear to the right of the dividing line.

"I. R." and "D. R." refer to immediate recall and delayed recall respectively.

"X²" refers to the product of the median test.

"p" refers to the statistical probability that the difference between scores occurred solely by chance.

"MD" refers to the difference between means.

than those of the control group. The difference between the traditional form and the random form approached the .05 level. The traditional form exceeded the repetitious form at the .01 level of confidence. For these relationships the null hypothesis is partially rejected.

The differences between means and X^2 scores are less for the delayed recall comparisons than they were for the immediate recall comparisons. Apparently the effects of the treatments decreased over time.

These continued differences between the programmed and traditional forms existed in spite of the sharp reduction of material. This reduction increased the comparability of the two types of presentation. It implies that many of the words normally involved in traditional informative speech may have little value when highly specific results are desired. In this experiment the number of words in the programmed forms was less than in the traditional form. The additional time was largely silent time between the question calling for a response and the subject's consideration prior to providing the answer. Some of the time involved the location and statement of the name of the subject asked to respond. Thus in general, the situation seems to have been biased against the programmed form. Their superior results in spite of this bias lend credence to the conclusion that the techniques were useful in this case and that the words eliminated were not useful.

Additional information on the differences between the programmed

and the traditional forms is provided in the results concerning stylistic changes in the text and test.

II. Recall scores of the group exposed to the random form will be no higher than of the group exposed to the repetitious form.

The statistically insignificant difference between these forms was in the opposite direction from that predicted.

This null hypothesis was not rejected. The repetitious form obtained slightly higher scores than the random form. The mean difference and statistical difference between the two forms was consistent and close between immediate and delayed recall scores. The repetitions may be interpreted as incipient subject response. In the speech situation in which an audience expects to be tested it seems reasonable to suspect that the audience is "rehearsing" answers to questions. At least they should be trying to identify statements which are important in the test. The audience had been notified that a test would be given and told that the speaker would attempt to help them obtain as high a score on the test as possible. Thus the abnormal number of repetitions should have signalled the material to be tested. In this case, then, repetitions probably produced incipient responses. Such an interpretation explains the high scores obtained by the repetitious form in the second experiment; it does not explain the conflict between the two experiments.

III. Semantic Differential scores of the groups exposed to the different speech forms will not differ.

Illustration I is a graph showing the results of the semantic

A means Random Form: Mean = .87 B means Repetitious form: Mean = .68
 C means Traditional Form: Mean = .54

Figure 1. Semantic differential results.

differential. Clearly the general patterns of all three speeches are similar. In general the reactions are positive with only four points crossing to the negative side of zero. This generally positive attitude may suggest that the subjects were responding to the experimental situation and trying to do what was expected of them. Since the traditional speech had been previously judged an effective speech and since the treatments generally improved comprehension, the generally positive attitude may suggest that the speeches were all better than the audiences were used to hearing in their basic speech classes. On the positive side of the scale, the speeches were generally judged to be "consistent," "orderly," "sure," "precise," and "organized." On the negative side they were judged to be "dull," "difficult," "heavy," and "impersonal." Most of these adjectives seem to apply rather directly to an experimental setting. In this case the suspicion that the general pattern can be attributed to audience response to the speech situation is supported.

The mean scores of the different forms on the Semantic Differential were: Random - 22.55, Repetition - 17.56, and Traditional - 13.97. Although these differences were not statistically significant, they suggest the random form was preferred by the audiences.

The Random form differed from the others most with the adjectives "interesting," "dull," "efficient," "successful," "informal," (particularly strong difference here), "slow," and "personal." Most of the characterizations seem consistent except for the

emphasis on the judgment "dull." Presumably personalization, efficiency and informality would prevent dullness.

The repetitive form was judged to be particularly "clear," "disorderly," and "simple." Clarity and simplicity are compatible with hearing the same thing over and over.

The traditional form was judged particularly "consistent," "pleasant," "orderly," and "vague."

This null hypothesis was not rejected.

IV. The estimated errors of groups exposed to the different speech forms will not differ significantly.

The correlation between the estimated errors and the comprehension scores for the random group was $-.52$. For the repetitious form it was $-.44$ and for the traditional form $-.37$.

There was a progression of mean estimated errors from random (7.07) through repetitious (8.27) to traditional (11.44). The difference between random and repetitious forms was not statistically significant. The difference between the random and traditional form was significant at the .03 level. This hypothesis is rejected.

Apparently the subjects obtained a clearer picture of what they did and did not know from the programmed forms than from the traditional form. If it is assumed that knowledge of one's own results is satisfying, then it seems likely that subjects prefer the programmed forms. Secondly, the amount of estimated error can be taken as an index of confidence suggesting that the programmed forms increase subject confidence. These results lead to the conclusion

that programming as done in this case is as desirable a method of speech from the viewpoint of the subjects as is the traditional informative speech.

V. Groups exposed to the revised programmed speech forms and the revised test will obtain scores no higher than the groups exposed to the original speeches and tests.

The most important feature of the revision was the elimination of much of the material that had been in the traditional speech. Approximately 25% of the original wording was eliminated. Part of it was "replaced" with additional emphasis on the tested items. The total number of words was reduced by 346 or 13%, with a corresponding decrease in time. Yet the comprehension scores increased slightly in the second experiment. Apparently the original words were not necessary and probably the revisions increased comprehension. It might be argued that as soon as the purpose outline was completed the value of any material not directly tested should automatically be suspect. Yet it is not traditional to limit goals of informative speaking as precisely as these were limited. This limitation is characteristic of programmed instruction. If nothing else, these results suggest the usefulness of detail and precision in identifying informative speech goals when possible.

Appendix J provides the original and revised programmed speech with indications of all the changes made and the reasons for the changes. Appendix M provides the original and revised versions of both listening tests with the number, and kinds, of changes

involved in each item. Inspection of these changes and the test scores provides the following rough generalizations.

Four items on the test were changed with no textual changes directly related to the items. However, the item difficulty changed for each speech form in the same direction. Thus items 4, 7, and 23 were apparently made easier by the test revision and item 11 made more difficult.

Twelve of the items show changes by the programmed speech and the traditional speech in different directions and eighteen of the items show changes in the same direction. This suggests that as much of the difference between experiments was caused by group differences as by revisions in the programmed speech manuscripts.

The times that both the programmed speech scores improved were compared with the times that both did not improve on the basis of the "reasons for change." The "reasons for change" were then ranked in terms of the proportion of times that they occurred along with improvement to the times they occurred without improvement. The resulting rank follows: (1) "b"-increases in parallelism between the text and test, (2) "c"-increased emphasis, (3) "g"-increased explicitness, (4) "a"-elimination of unnecessary words not directly related to items, (5) "d"-elimination of some material on easy items. The other types of changes did not appear. On the two test items on which the programmed speeches both went down, one item showed a change in the test and one item showed no change at all.

There were seven cases in which the programmed speeches produced

changes different in direction from the traditional speech. In all cases the programmed speech went up and the traditional speech went down. In two of these cases the test was changed. In the other five cases there seems to be no explanation for the drop other than sampling error.

CHAPTER V

SUMMARY AND IMPLICATIONS

Summary

This study has been concerned with three general variables.

Of primary concern was the effect on comprehension of controlled audience response. Audience response was produced and controlled in a manner consistent with the techniques of programmed learning. The programmed techniques involved four aspects: highly structured and specific statement of purpose, stimuli calling for specific, predictable, overt audience response, overt responses, and overt reinforcement consistent with the responses.

Two programming techniques and one semi-programmed technique were developed. One programming technique involved response to questions by the whole audience in unison. One involved random designation by the lecturer of an individual to respond. The semi-programmed form used repetition in place of programmed responses.

The second purpose for this study was audience preference for programmed vs. non-programmed informative speeches.

The third concern was the effects on comprehension of stylistic

changes in programmed material. The stylistic changes had the primary purposes of reducing message length, increasing message explicitness, and selectively increasing message emphasis.

The effects of programmed messages were evaluated in two experiments. The first experiment evaluated the general effects of programming on comprehension, the relative effects of the different programming forms on comprehension, and the differential effects of programming across two speech topics and two speakers.

Comprehension was measured by a 30 item multiple-choice test used immediately following the communication and after a three-week delay.

The comprehension scores of groups exposed to the programmed messages exceeded the scores of groups exposed to the traditional message and the control groups. The differences were statistically significant. It was concluded that the programming improved comprehension.

The programmed forms did not vary differentially between the temperature speech and the listening speech.

The programmed forms did not vary differentially between speakers.

The lack of differential effects between topics and speakers does not permit the inference that programming techniques are useful across all topics and speakers. It does permit the inference that

they are probably useful for some topics and speakers other than those involved in this experiment.

The second experiment re-evaluated the comprehension effects of one programmed form (the random form) and the semi-programmed form in comparison to the traditional form and a control test. The second experiment also evaluated audience preference. Finally, the second experiment evaluated the effects of stylistic changes.

The scores obtained by the groups exposed to the programmed and semi-programmed forms generally exceeded the scores obtained by the groups exposed to the traditional speech and the control group. This difference was consistent with the findings in the first experiment and supports the conclusion that programming techniques can be usefully applied to the lecture in some cases.

Scores did not produce differential effects across speakers in the second experiment either. Again, the conclusion that the programmed techniques might be useful for different speakers was supported.

Scores of the groups receiving the programmed form were more closely related to those receiving the semi-programmed form in experiment one than they had been in experiment two. It was posited that the repetitions constituted covert audience rehearsal of the material in much the same manner that the programmed form produced overt audience rehearsal. The relative value of overt audience response cannot be determined in light of the conflicting results.

The programmed and semi-programmed speeches in the second experiment obtained significantly higher scores than those in the first

experiment. It was concluded that the reduction of message size did not reduce comprehension when it was accompanied by greater emphasis and explicitness of tested items.

The two measures of audience preference, a semantic differential and an estimate of error, both indicated audience preference for the programmed form first, the semi-programmed form second, and the traditional form third. It is inferred that in addition to the likelihood of increased comprehension, programming techniques can increase audience interest and motivation.

Implications

While the use of rhetorical questions constitutes standard device in both informative and persuasive speaking, the use of questions calling for overt audience response is not recommended in standard textbook treatments of informative speaking. The results of these two experiments indicated that the inclusion of such questions as one of the alternative devices from which a speaker can draw is justified.

While a lengthy list of additional related research hypotheses is possible, such a list probably is not useful. However, there are four questions closely related to this research which seem particularly relevant to anyone considering the more extensive use of programming techniques in informative speech.

1. What are the effects of programmed learning techniques when periodically used in a lecture series? Effects of programming

techniques may change markedly if they are used periodically in a series of lectures such as those involved in most college and high school classrooms. Students exposed to the speeches in these experiments were unused to the techniques. As a result they had a novelty effect which could have increased audience interest. However, unfamiliarity with the techniques may also have caused unnecessary attention to be placed upon the techniques and thereby distracted from the message content.

2. What are the effects of programmed learning techniques when used with different types of material? The concern here is not for different topics. It may be that material not normally attended to by an audience is effectively emphasized by programming techniques. Similarly, material to be memorized may respond more readily to programming than material to be analyzed. Research concerning this question would provide more accurate and qualified recommendations concerning the use of the techniques.

3. What are the effects of programming techniques on different kinds of audience response? If used in persuasive speeches, programmed responses may constitute a type of commitment. Programmed learning has traditionally been concerned with comprehension. Research on this question would provide a potential basis for broadening the scope of programming techniques.

4. What are the social effects of programmed learning in the lecture situation? In the lecture situation programmed responses are observed by a group of learners. Presumably it has social effects.

Identification and manipulation of social effects would increase the ability of a lecturer to use group variables in effecting comprehension.

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APPENDIX A
ORIGINAL TEMPERATURE OUTLINE

ORIGINAL TEMPERATURE OUTLINE

- I. Weather can be predicted.
 - A. Meteorologists can predict it a day in advance.
 - B. Meteorologists cannot predict it a week in advance.
 - 1. One method of prediction is the Polar-Front Theory dealing with the results to be expected when a mass of cold air from the North Pole meets a mass of warm air from the tropics.
 - C. One method deals with measuring the amount of heat received from the sun by the earth.
 - 1. Yearly variation occurs.
 - 2. Long range forecasts may be possible by the system.
 - D. One method of collecting data is by airplane.
 - E. One method is by balloons with instruments.
 - 1. It is inexpensive.
 - 2. It uses electric eyes to report the amounts of light in a cloud.
 - 3. Time a balloon disappears in a cloud indicates its thickness.
 - F. Barometers help predict weather.
 - 1. The mean barometer reading in Columbus is 28.8 inches.
 - 2. A sudden falling of the barometer usually means a change toward unsettled weather.
- II. Temperature of the air plays a large part in weather.
 - A. It produces winds at the equator.
 - B. These winds can be predicted.
 - C. The hot air rises at the equator and flows toward the poles.
 - D. Surface air flows toward the equator.
 - E. Air flowing toward the equator is called trade winds.
 - F. Air flowing toward the poles is called anti-trade winds.
- III. Wind direction is influenced by local temperature, mountain ranges and the like.
 - A. The earth's rotation throws the surface winds to the right.
 - B. Thus the southernly winds going to the equator are thrown to the right and go in a southwesternly direction.
- IV. Temperature in the different zones is determined by the slant of the sun's rays.
 - A. High temperature at the equator is caused by direct sun rays.
 - B. In the temperature zone the earth's curvature spreads the same number of rays over a larger area and reduces the temperature.
- V. The moving air effects rain.
 - A. The chief cause of rain is the cooling of ascending air currents.
 - B. The cooling condenses the moisture in the air.
 - C. If there is enough water vapor present it rains.

VI. Temperature.

- A. We feel warmth or coldness through the air.
- B. Two-thirds of the bodily energy we have comes from the air we breathe.
- C. We need 3 pounds of food and four pounds of water daily, but we must have $3\frac{1}{4}$ pounds of air daily.
- D. The air must be kept at the right temperature, moistness and in motion.
- E. The correct temperature of air indoors in the winter time is 68 degrees Fahrenheit.
- F. The correct temperature of air indoors in the summer is 80 degrees to prevent sudden changes in temperature.

VII. Relative humidity is as important as temperature.

- A. Relative humidity means the amount of moisture in the air in comparison with the total amount of moisture possible at that temperature.
- B. Humidity should be between 30 and 70% winter and summer.
- C. Winter air is usually dry, often getting below 20%.
- D. Summer air is humid and may go over seventy per cent.
- E. If humidity is excessive our perspiration system does not operate properly.

VIII. Temperature control is limited by construction materials.

- A. In ordinary wooden homes, air at the ceiling is 25 degrees warmer than on the floor.
- B. Mineral wool can be used as an insulator.
 - 1. Still air is an excellent insulator.
 - 2. Mineral wool captures still air in its fibers.
 - 3. Mineral wool is an excellent insulator.
- C. An effective insulator means a poor conductor of heat.
 - 1. Brick will conduct heat 10 times faster than mineral wool.
 - 2. Glass will conduct heat 20 times faster than mineral wool.
 - 3. Still air is the best insulator.
 - 4. Silver is the best heat conductor, allowing nearly all the heat to pass through it.

IX. Electric refrigeration contributes to the ease of our homes.

- A. The idea used in electric refrigeration is simple.
 - 1. When vapor is compressed it gets hot.
 - 2. If the hot vapor is rapidly cooled by water or flowing air, it expands and becomes colder than its surroundings.
 - 3. This act is repeated over and over to get the box cool.
 - 4. The cooling of heated vapor is the basis of electric refrigeration.
- B. The vapor used most in modern electric refrigerators is called Freon.
 - 1. It is neither poisonous nor explosive.

- X. The only limit in cold refrigeration is absolute zero.
 - A. At absolute zero all molecular motion stops.
 - B. Absolute zero is slightly less than 460 degrees below zero Fahrenheit.
 - C. Recent experiments have gotten areas so cold they are within a few thousandths of a degree of this figure.
 - D. Carbon dioxide snow, popularly called dry ice, is over 207 degrees below zero Fahrenheit.
 - E. The temperature of absolute zero can be compared to the heat of other elements.
 - 1. Our body temperature is 98.6 degrees Fahrenheit.
 - 2. A fowl is 112 degrees Fahrenheit.
 - 3. The flame of an oxyacetylene torch, one of our hottest instruments, is slightly below 800 degrees Fahrenheit.
 - 4. Water boils at different temperatures varying with its height.
 - a. The higher the water the lower temperature at which it boils.
 - b. In Columbus water boils at 210.5 degrees Fahrenheit.
- XI. Heating of houses is important.
 - A. There is a great difference in heating fuels.
 - B. Heat is measured by two systems.
 - 1. The unit of measurement for the metric system is a calorie.
 - 2. A calorie is the amount of heat necessary to raise one gram of water one degree, centigrade.
 - 3. The unit for measurement of the English system is the BTU.
 - 4. A BTU is the amount of heat required to raise a pound of water one degree, fahrenheit.
 - C. Different fuels give off different BTU's of heat.
 - 1. Soft coal varies from 11,000 to 14,000 BTU's.
 - 2. Hard coal varies from 14,000 to 15,000 BTU's.
 - 3. Crude petroleum will give nearly 20,000 BTU's.
 - 4. Bacon has as many BTU's /lb for the body as soft coal does for homes.
 - 5. Bacon gives 11,200 BTU's per pound.

APPENDIX B

PURPOSE OUTLINE OF TEMPERATURE SPEECH

PURPOSE OUTLINE OF TEMPERATURE SPEECH

I. Indoor "weather" is important.	
A. We spend 90% of our time indoors.	7
II. The three components of indoor weather are circulation, relative humidity, and temperature.	
A. Circulation deals with the amount of movement of air.	
1. Circulation prevents staleness in air.	13
2. Circulation keeps temperature constant.	3
B. Relative humidity is defined as the amount of moisture in the air compared to the total moisture possible at that temperature.	25
1. Relative humidity should be no lower than 30%	2
2. Relative humidity should be no higher than 50%.	2
3. Winter air is usually drier than summer air.	26
4. Humidity is partially controlled by air conditioning.	15
C. Temperature deals with the amount of heat in the air.	29
1. Temperature is controlled by heating.	
a. Heat is measured by the metric system.	11
1. The unit of measurement for the metric system is a calorie.	11
2. A calorie is the amount of heat necessary to raise one gram of water one degree centigrade.	28
b. Heat is measured by the English system.	27
1. The unit of measurement for the English system is the British Thermal Unit.	27
2. A British Thermal Unit is the amount of heat necessary to raise a pound of water one degree fahrenheit.	5
c. Heating fuels vary in their efficiency.	6
1. Soft coal is less efficient than hard coal.	6
2. Hard coal is less efficient than oil.	6
2. Temperature is controlled by air conditioning.	29 & 15
a. There are 4 steps in air conditioning.	24
1. The first step is the compression of hot vapor.	
2. The second step is the rapid cooling of the heated vapor.	14 & 24
3. The third step is the expansion of the cooled vapor.	13 & 24

4. The fourth step is final cooling of vapor. 30 & 24
- b. Ideal vapor for air conditioning is Freon. 22
 1. Freon vapor is not poisonous. 19
 2. Freon vapor is not explosive. 19
- c. Air conditioning is limited by absolute zero. 20
 1. Absolute zero is slightly less than 460 degrees below zero Fahrenheit. 23
 2. At absolute zero molecular motion stops. 16
 3. Air conditioning processes can reduce temperature to within a few thousandths of a degree of absolute 0. 20
3. Temperature is controlled by insulation. 9
 - a. Poor insulation permits high air to be 25 degrees warmer than low air in ordinary wooden homes. 10
 - b. The quality of insulation is determined by the amount of heat conducted through it. 18
 - c. Insulation is useful for both heating and cooling. 21
 - d. The best insulation is motionless air. 8
 - e. Mineral wool is an excellent insulator. 18.
 1. It captures air between its fibers. 18
 2. It uses the motionless air to insulate. 18
 - f. Brick conducts heat ten times as fast as mineral wool. 1
 - g. Glass conducts heat better than brick. 4

APPENDIX C
TRADITIONAL TEMPERATURE SPEECH

Mark Twain made this oft-quoted remark about everyone talking about the weather but no one doing anything about it, at the opportune moment. Now, though the people still talk about the weather as much as ever, scientists have really begun to do something about it. It is still impossible to change a nor'easter into a lovely day, or to make a hot August afternoon as cool and "lovely as a day in June." We can, however, control the weather in our immediate vicinity most of the time. It has been found that we spend nine-tenths of our time indoors, and we can control our environment there.

To go then to some ideas about temperature. We feel warmth or coldness through the air. This air must be kept at the right temperature and moistness, and above all, moving slowly. Motionless air, no matter how pure, is stale air.

It has been found in studies that the correct temperature of air indoors in the winter time is 68 degrees Fahrenheit. In the summer, however, this must be raised as the important thing is to keep the temperature up to nearly what it is outside. This is necessary since a sudden chilling is very injurious to a person. In the summer the air indoors seldom should be less than eighty degrees.

The relative humidity of the air is as important as the temperature. Relative humidity means the amount of moisture in the air in comparison with the total amount of moisture possible at that temperature. The humidity should be between 30 and 70%, winter and summer. Winter air is usually dry, often getting below 20%, while in the summer the humidity may go over seventy. When the moisture is

too high in content in the air, our own cooling system, evaporation of perspiration, cannot function properly. One purpose of air conditioning is to remove the excess water from the air.

The possibilities of controlling temperature within a house are limited by the materials used in construction. In our ordinary wooden homes, the air at the ceiling is 25 degrees warmer than on the floor, so poor is our insulation. A mineral wool can be used as an insulator. The air between the fibers does not move, and still air is an effective insulator. By effective insulator we mean it is a poor conductor of heat. Brick will conduct heat ten times faster than mineral wool, while glass used in windows will allow heat to pass through it twenty times faster than wool. Still air is the best insulator or non-conductor, letting through less heat than mineral wool alone.

Besides insulation and air-conditioning, one of the most recent additions to the ease of our homes is the electric refrigerator. The idea used in this type of refrigeration is comparatively simple. Vapor is compressed to make it hot. The hot vapor is rapidly cooled by water or flowing air, it expands, and becomes colder than its surroundings. This act is repeated over and over to get the refrigerator cool. The cooling of heated vapor, then, is the basis of electric refrigeration. The vapor used in most modern electric refrigerators is called Freon. It is an ideal vapor because it is neither poisonous nor explosive.

The only limit in cold refrigeration is the absolute zero at

which all molecular motion stops. This point is slightly less than 460 degrees below zero on the Fahrenheit scale. Recent experiments have gotten areas so cold they are within a few thousandths of a degree of this figure.

We have discussed the cooling of homes of our environment, but the heating of houses is just as important. We often think that coal is coal, and it makes little difference what we buy as long as we pay a good price for it. This is not true, however, as there is a great difference. Measuring heat is done by two systems. The unit of measurement for the metric system is a calorie. A calorie is the amount of heat necessary to raise one gram of water one degree, centigrade. For the English system, the unit is the BTU, an abbreviation for the British Thermal Unit. A BTU is the amount of heat required to raise a pound of water one degree, Fahrenheit. A pound of water is approximately a pint.

To show the difference in coal, soft coal varies in the amount of heat given from 11,000 to 14,000 BTU's. Hard coal begins at 14,000 and gives as high as 15,000 BTU's. Crude petroleum, a type similar to that used in oil burners, will give nearly 20,000 heat units. Thus we see we must take into consideration the heat units given off as well as the price.

These are a few of the ideas of temperature as a part of our environment with which we should become acquainted.

APPENDIX D
PROGRAMMED TEMPERATURE SPEECH

Mark Twain noted that everybody talks about the weather but no one does anything about it. Yet we spend 90% of our time indoors, and there at least, we exert a great deal of control over our "weather." Today we will spend about ten minutes considering the nature of indoor weather and how it is controlled.

Indoor weather involves three things: circulation, which deals with the amount of movement of air; relative humidity which deals with the amount of moisture in the air; and temperature, which involves the amount of heat. Did you get that? What were the components of indoor weather? /circulation, relative humidity, and temperature/ All of these are related because if one changes, the requirements of the others change. It is essential that air circulates because motionless air, no matter how pure, is stale air. Proper circulation also prevents one part of the room from being hotter or colder than other parts. In a moment we shall consider how important that is. However, now think back to the two reasons for circulating air: what were they? /prevents staleness and keeps temperature constant./

Now remember the second component of weather: relative humidity. Relative humidity means the moisture in the air compared to the total moisture possible at that temperature. See if you can repeat that definition. /(repeat definition)/ Relative humidity should be no lower than 30% or higher than 70%. However, winter air is usually dry, often going 10% lower than it should. At that point how low would the humidity be? /20%/ In summer, humidity often goes

over the 70% it should be. One purpose of air conditioning is to remove the excess water from the air.

The third general element of weather was -- what? /temperature/ We shall consider it at much greater length. In order to keep the proper temperature indoors we change it through heating and air conditioning. Both processes, heating and air conditioning, are more efficient if the house is well insulated because insulation prevents heat from passing through the house walls. So altogether we have listed three ways to control temperature indoors. What were they? /heating, air conditioning, insulation/

First, consider heating. In winter we increase temperature by heating our homes with a variety of fuels; coal and oil for example. The efficiency of the fuel varies considerably. To see how much it varies, let us consider the way heat is measured.

There are two systems for measuring heat; the calorie and the BTU. The unit of measurement for the metric system is a calorie. A calorie is the amount of heat necessary to raise one gram of water one degree centigrade. To remember that, fill in the blanks in this sentence: A calorie of heat will raise one _____ of water one degree _____. /gram, centigrade/ What system uses the calorie? /metric/

For the English system, the unit is the BTU, an abbreviation for the British Thermal Unit. A BTU is the amount of heat required to raise a pound of water one degree fahrenheit. A pound of water is approximately a pint. How many BTU would be necessary to raise

the temperature of a quart of water 2 degrees? /4 BTU/ - since there are two pints or pounds in a quart times two degrees equal four. What did the letters BTU stand for? /British Thermal Unit/

We will measure differences among fuels in BTU's. Soft coal varies from 11,000 to 14,000 BTU's. Hard coal starts where soft coal leaves off, and goes from 14,000 to 15,000 BTU's. Crude petroleum, a type similar to that used in oil burners, will give nearly 20,000 BTU's. Thus when we buy fuel we must consider the heat units given off as well as prices. Now name the three fuels going from the one which gives off the most heat per unit to the one giving the least. /oil, hard coal, soft coal/ How much heat is a BTU? /enough to raise the temperature of a pound of water one degree/

So much for heating our homes. The second method of controlling temperature was air conditioning. One purpose of air conditioning was mentioned when I discussed humidity. What was it? /remove excess moisture/ The principle of air conditioning is simple. If vapor is compressed it gets hot. If this hot vapor is rapidly cooled by water or flowing air, it expands and becomes colder than its surroundings. This act - compression, heating, rapid cooling, expansion, cooling - is repeated over and over. The cooling of heated vapor, then, is the basis of electric refrigeration. The vapor used in most modern electric refrigerators is called freon. It is an ideal vapor because it is neither poisonous nor explosive. Now repeat the five

steps in electric refrigeration. First_____/compression/
 Second_____/heating/ Third_____/rapid cooling/ Fourth_____/
 expansion/ Fifth_____/cooling/ What are the two benefits of
 Freon vapor? /non-poisonous and non-explosive/

The only limit in cold refrigeration is absolute zero at which
 all molecular motion stops. This point is slightly less than 460
 degrees below zero on the Fahrenheit scale. Recent experiments
 have gotten areas so cold they are within a few thousandths of a de-
 gree of this figure. How cold is absolute zero? /460 degrees below
 zero fahrenheit/ What happens to molecules at 460 degrees below
 zero fahrenheit? /They cease to move/

Both heating and air conditioning are more efficient if the
 house is well insulated. We shall now consider this third element
 of temperature control - insulation. In our ordinary wooden homes,
 insulation and circulation are so poor that the air at the ceiling
 is 25 degrees warmer than on the floor. Thus a tall man may have a
 temperature of 65 degrees at his feet; 90 degrees at his head.
 The quality of an insulator is determined by the amount of heat
 conducted through it. The less heat is conducted, the better the
 insulation. The best insulator is motionless air. Mineral wool
 captures bubbles of air and is therefore an excellent insulation.
 Brick will conduct heat 10 times faster than mineral wool and glass
 will conduct it 20 times faster. Thus for insulation purposes which
 of the three is best? /mineral wool/ Which second best? /brick/

Which third best? /glass/ Why is mineral wool the best? /It holds quiet air./

Let's review quickly. What were the three main aspects of "indoor weather"? /circulation, relative humidity, temperature/ What were the three general ways to control temperature indoors? /heating, air conditioning, insulation/ How much heat is required to raise one gram of water one degree centigrade? /a calorie/ How much heat raises one pound of water one degree fahrenheit? /one BTU/ How cold is absolute zero? /460 below zero fahrenheit/

APPENDIX E
REPETITIOUS TEMPERATURE SPEECH

Mark Twain noted that everybody talks about the weather but no one does anything about it. Yet we spend 90% of our time indoors, and there at least, we exert a great deal of control over our "weather." Today we will spend about ten minutes considering the nature of indoor weather and how it is controlled.

Indoor weather involves three things: circulation which deals with the amount of movement of air; relative humidity which involves the amount of moisture in the air; and temperature which involves the amount of heat. Note: the components of indoor weather are circulation, relative humidity, and temperature. All of these are related because if one changes, the requirements of the others change. It is essential that air circulates because motionless air, no matter how pure, is stale air. Proper circulation also prevents one part of the room from being hotter or colder than other parts. In a moment we shall consider how important that is. However, now think back to the two reasons for circulating air: it prevents staleness and keeps temperature constant.

Now remember the second component of weather - relative humidity. Relative humidity means the moisture in the air compared to the total moisture possible at that temperature. Remember the definition; relative humidity means the moisture in the air compared to the total moisture possible at that temperature. Relative humidity should be no lower than 30% or higher than 70%. However, winter air is usually dry, often going 10% lower than it should. At that point the humidity would be 20%. In summer, humidity often goes

over the 70% it should be. One purpose of air conditioning is to remove the excess water from the air.

The third general element of weather was temperature. We shall consider it at much greater length. In order to keep the proper temperature indoors we change it through heating and air conditioning. Both processes, heating and air conditioning, are more efficient if the house is well insulated because insulation prevents heat from passing through the house walls. So altogether we have listed three ways to control temperature indoors. They were heating, air conditioning, and insulation.

First, consider heating. In winter we increase temperature by heating our homes with a variety of fuels; coal and oil for example. The efficiency of the fuel varies considerably. To see how much it varies, let us consider the way heat is measured.

There are two systems for measuring heat; the calorie and the BTU. The unit of measurement for the metric system is a calorie. A calorie is the amount of heat necessary to raise one gram of water one degree centigrade. Again, a calorie of heat will raise one gram of water one degree centigrade. And the system using the calorie is the metric system.

For the English system, the unit is the BTU, an abbreviation for the British Thermal Unit. A BTU is the amount of heat required to raise a pound of water one degree fahrenheit. A pound of water is approximately a pint. Thus the number of BTU necessary to raise the

temperature of a quart of water 2 degrees is four. Since there are two pints or pounds in a quart times two degrees equal four. And the letters BTU stood for British Thermal Unit.

We will measure differences among fuels in BTU's. Soft coal varies from 11,000 to 14,000 BTU's. Hard coal starts where soft coal leaves off, and goes from 14,000 to 15,000 BTU's. Crude petroleum, a type similar to that used in oil burners, will give nearly 20,000 BTU's. Thus, when we buy fuel we must consider the heat units given off as well as prices. So, going from the fuel which gives off the most heat per unit to the one giving the least, we have named oil, hard coal, and soft coal. And we have said that a BTU is enough heat to raise the temperature of a pound of water one degree.

So much for heating our homes. The second method of controlling temperature was air conditioning. One purpose of air conditioning was mentioned when I discussed humidity: that it removes excess moisture. The principle of air conditioning is simple. If vapor is compressed it gets hot. If this hot vapor is rapidly cooled by water or flowing air, it expands and becomes colder than its surroundings. This act - compression, heating, rapid cooling, expansion, cooling - is repeated over and over. The cooling of heated vapor, then, is the basis of electric refrigeration. The vapor used in most modern electric refrigerators is called freon. It is an ideal vapor because it is neither poisonous nor explosive. Now review the five steps in electric refrigeration. First, compression; second,

heating; third, rapid cooling; fourth, expansion; fifth, cooling. Remember that the benefits of Freon vapor are that it is non-explosive and non-poisonous.

The only limit in cold refrigeration is absolute zero at which all molecular motion stops. This point is slightly less than 460 degrees below zero on the Fahrenheit scale. Recent experiments have gotten areas so cold they are within a few thousandths of a degree of this figure. Note, absolute zero is 460 degrees below zero fahrenheit and that is the point at which all molecular action stops.

Both heating and air conditioning are more efficient if the house is well insulated. We shall now consider this third element of temperature control - insulation. In our ordinary wooden homes, insulation and circulation are so poor that the air at the ceiling is 25 degrees warmer than on the floor. Thus a tall man may have a temperature of 65 degrees at his feet; 90 degrees at his head. The quality of an insulator is determined by the amount of heat conducted through it - the less heat conducted the better the insulator. The best insulator is motionless air. Mineral wool captures bubbles of air and is therefore an excellent insulation. Brick will conduct heat 10 times faster than mineral wool and glass will conduct it 20 times faster. Thus for insulation purposes mineral wool is best because it holds quiet air, brick is second best and glass is third best.

Let's review quickly. The three main aspects of "indoor weather" are circulation, relative humidity, and temperature. The three general ways to control temperature indoors are heating, air conditioning, and

insulation. A calorie is the heat required to raise one gram of water one degree centigrade and a BTU is enough heat to raise one pound of water one degree fahrenheit. Finally, absolute zero is 460 degrees below zero fahrenheit.

APPENDIX F

TEMPERATURE TEST AND ITEM RESULTS FOR PROGRAMMED SPEECHES

This appendix includes the temperature test and the item difficulty for the random and unison forms on the immediate recall test. "R" means random, immediate recall; "U" means unison, immediate recall.

INSTRUCTIONS: DO NOT MARK ON THE TEST BOOKLET! Mark your answer sheet to indicate which of the five choices is the MOST accurate.

1. Brick will conduct heat how much faster than mineral wool?
 - a. twice as fast
 - b. five times as fast
 - c. ten times as fast 73.08 R
 - d. twenty times as fast 58.34 U
 - e. thirty times as fast

2. Relative humidity should always be:
 - a. 30%
 - b. 50%
 - c. between 30 and 50% 84.62 R
 - d. between 60 and 85% 49.17 U
 - e. depends on too many other things to be fixed at all

3. If air is constantly circulated
 - a. it helps keep a constant temperature throughout a room.
 - b. it helps prevent air from becoming stale.
 - c. it frequently causes a cold. 88.46 R
 - d. a and b 89.58 U
 - e. b and c

4. Which statement is true?
 - a. Brick is a better heat conductor than glass.
 - b. Mineral wool is a better heat conductor than brick.
 - c. Glass is a better heat conductor than brick. 69.23 R
 - d. The best heat conductor is quiet air. 66.67 U
 - e. The best heat conductor is freon.

5. The unit of heat used in the English system of measurement measures the amount of heat required to:
 - a. raise one ounce of water one degree fahrenheit.
 - b. raise one gram of water one degree centigrade.
 - c. raise one pound of water one degree fahrenheit. 92.31 R
 - d. raise one quart of water one degree centigrade. 93.75 U
 - e. raise one ounce of water one degree centigrade.

6. Rank the following fuels with that which gives off most heat first and that giving off the least heat third: 1. soft coal
2. crude petroleum 3. hard coal.
 - a. 1 - 2 - 3
 - b. 2 - 3 - 1

- c. 3 - 2 - 1
 - d. 2 - 1 - 3
 - e. 3 - 1 - 2
- 90.77 R
85.42 U
7. The amount of time spent indoors is approximately:
- a. 30%
 - b. 50%
 - c. 70%
 - d. 80%
 - e. 90%
- 76.92 R
66.67 U
8. The best insulator is
- a. metal.
 - b. paper.
 - c. glass.
 - d. wood.
 - e. quiet air.
- 88.46 R
72.92 U
9. The following methods of temperature control were discussed.
- a. insulation
 - b. de-humidifiers
 - c. British Thermal Units
 - d. a and b
 - e. all of the above
- 46.16 R
47.92 U
10. In our ordinary wooden homes insulation and circulation permit air at the ceiling to differ from air on the floor by as much as
- a. 5 degrees
 - b. 10 degrees
 - c. 15 degrees
 - d. 20 degrees
 - e. 25 degrees
- 92.31 R
33.34 U
11. The unit of measurement of heat in the metric system is called:
- a. calorie
 - b. B.T.U.
 - c. centigrade
 - d. Thermal capacity
 - e. fahrenheit
- 96.15 R
97.92 U
12. Motionless air
- a. is a rapid conductor of heat.
 - b. is easier to breathe than moving air.
 - c. is desirable when indoors.
 - d. normally lacks purity.
 - e. is stale air.
- 92.31 R
89.58 U

13. In refrigeration, when hot vapor is rapidly cooled it
- a. expands.
 - b. becomes heavier.
 - c. liquifies. 57.64 R
 - d. all of the above. 56.26 U
 - e. none of the above.
14. During refrigeration, when vapor is compressed it
- a. expands.
 - b. gets cooler.
 - c. gets hot. 65.38 R
 - d. liquifies. 54.17 U
 - e. rises.
15. Air conditioning is useful to
- a. improve insulation.
 - b. remove excess moisture.
 - c. reduce temperature. 65.38 R
 - d. a and b 79.17 U
 - e. b and c
16. At absolute zero, molecules
- a. cease to move.
 - b. increase movement.
 - c. move further apart and slow down. 96.15 R
 - d. move closer together and speed up. 95.83 U
 - e. are unaffected.
17. The reason mineral wool is a good insulator is:
- a. it is closely knit so no air gets through.
 - b. the air between the fibers acts as a good insulator.
 - c. it reflects heat. 76.92 R
 - d. its padding acts as another coat for air to pass through. 81.25 U
 - e. it absorbs sun's rays.
18. According to this speech, the quality of an insulator is determined by:
- a. the amount of heat conducted through it.
 - b. its weight per cubic foot.
 - c. its cost per pound. 92.31 R
 - d. its combustibility. 93.75 U
 - e. its strength.
19. Ideal vapor for refrigerators should be
- a. non-poisonous.
 - b. non-explosive.
 - c. non-odorous. 96.15 R
 - d. a and b 93.75 U
 - e. a and c

20. Cold refrigeration is capable of lowering temperature no further than
- to within a few thousandths of a degree of absolute zero.
 - approximately 10 degrees below absolute zero centigrade.
 - approximately 10 degrees above zero centigrade. 69.23 R
 - to zero degrees fahrenheit. 66.67 U
 - to any temperature if equipment is of high quality.
21. Insulation is of value when
- there is a need to heat the home.
 - there is a need to cool the home.
 - there is a need to circulate the air. 84.62 R
 - a and b. 89.58 U
 - b and c.
22. Most modern electric refrigerators use
- neon.
 - hydrogen.
 - carbon dioxide. 96.15 R
 - freon. 85.42 U
 - helium.
23. Absolute zero is about
- 510 degrees below zero fahrenheit.
 - 460 degrees below zero fahrenheit.
 - 320 degrees below zero fahrenheit. 100.00 R
 - 180 degrees below zero fahrenheit. 100.00 U
 - zero degrees fahrenheit.
24. What is the proper order of events in electric refrigeration?
1. compression
 2. rapid cooling
 3. expansion
 4. heating
 5. cooling
- 1 - 2 - 3 - 4 - 5
 - 3 - 4 - 5 - 1 - 2
 - 1 - 4 - 2 - 3 - 5 90.77 R
 - 5 - 2 - 1 - 3 - 4 70.84 U
 - 4 - 1 - 5 - 2 - 3
25. Relative humidity means
- the amount of moisture in the air.
 - the amount of moisture in the air in comparison to the amount possible at that temperature.
 - the amount of moisture in the air in comparison to the amount that should be present. 84.62 R
 - the heat compared with the moisture. 75.00 U
 - none of the above.

26. Which statement is best?
- a. Winter air is drier than summer air.
 - b. Summer air is drier than winter air.
 - c. In spite of some variation, winter and summer air are approximately the same. 84.62 R
 - d. There is too much variance for a general statement to be made. 81.25 U
 - e. Summer air is about five times as damp as winter air.
27. The unit of measurement of heat in the English system is called
- a. calorie.
 - b. B.T.U.
 - c. centigrade. 96.15 R
 - d. fahrenheit. 93.75 U
 - e. thermal capacity.
28. The unit of heat used in the metric system measures the amount of heat required to:
- a. raise one ounce of water one degree, centigrade.
 - b. raise one gram of water one degree centigrade.
 - c. raise one liter of water one degree centigrade. 100.00 R
 - d. raise one pound of water one degree fahrenheit. 91.67 U
 - e. raise one pint of water one degree centigrade.
29. Which of the following methods of temperature control were discussed?
- a. heating
 - b. de-humidifiers
 - c. air conditioning 100.00 R
 - d. a and c 96.93 U
 - e. b and c
30. In refrigeration when vapor is expanded it
- a. gets cooler than its surroundings.
 - b. gets as cool as the cooling agent.
 - c. contracts. 69.23 R
 - d. becomes lighter. 79.17 U
 - e. a and c

APPENDIX G
ORIGINAL LISTENING OUTLINE

With the exception of the first point taken from the introduction of Kibler's "easy" listening message, the following outline is taken directly from him.

I. Listening is important.

- A. Listening is the communication skill most frequently used.
- B. We listen three times as much as we read.
- C. Listening is not taught sufficiently in the classroom.

II. Why study listening?

- A. There is a wide range of difference in students' listening abilities.
 - 1. The Jones' study at Columbia revealed the highest scores among a group of students were about six times higher than the lowest scores.
- B. Not enough attention has been given to listening in our formal training. It has been considered by all, but really by none. Since the responsibility for teaching listening belongs to no one, no one really teaches it.
 - 1. Nichols points out daily practice does not eliminate the need for training.
 - a. Practicing the same faults without supervised training is falsely assuming that "practice makes perfect."
 - b. Good listening habits are taught, not caught.
 - 2. In a survey conducted by the National Council of Teachers of English in three hundred towns, in thirty-five states, and involving 2,615 persons, it was determined that listening was one of the most important skills that needed to be taught.
 - 3. Paul T. Tankin, in a study, indicated that listening ability is by far the most-frequently-used ability in communication in everyday life situations, yet listening receives less attention in school time than reading, writing, and speaking.
 - a. Listening is used in life three times as much as reading, yet, in school, received less than one-sixth as much emphasis.
 - b. Listening ability can be developed but, without special training, it does not develop adequately for life needs.
- C. Experimental studies reveal that training in listening increases comprehension and understanding. Good listening habits can be learned - old or young dogs can be taught listening skills.

1. Dr. Clyde Dow reports that Charles Irvin tested 1,400 college freshmen at Michigan State University before and after training in listening.
 - a. The groups that had received listening training improved 9-12 per cent over the group with no training.
 - b. The greatest gain was made by poor listener groups to the above average listener groups.
 - c. Most poor listeners raised to what was considered an above-average listener prior to training in listening.
2. Dr. Arthur Heilman measured the effect of training in listening on improvement of ability of college freshmen to listen.
 - a. Dr. Heilman gave the students a listening test and then they were taught six lessons on listening followed by a second listening test.
 - b. Listening ability of the group who received training was greatly improved over those students who had had no training, as well as over the students' original scores.
 - c. Students with higher I.Q. scores who had low listening scores improved more than any other group.
 - d. The group that received training in listening scored higher in an outside listening situation.
3. Forrest Whan revealed that training airplane pilots to listen was valuable.
 - a. Pilots learning to stress certain speech and listening habits would reduce the number of messages that needed repeating.
 - b. Teaching pilots to adapt to the listener, based on special consideration of flying conditions, produced pilots who were able to modify their behavior more quickly and more accurately.
4. Studies by Johnson and Haugh support Irvin's and Heilman's findings.

III. What is listening?

- A. Hearing and listening are not the same.
 1. Hearing is identified as the perception of sound only.
 - a. To hear is to APPREHEND - to become aware through the senses.
 - b. Listening ability is not closely related to hearing acuity.
 1. Only 3 to 6 per cent of the nation's school children have severe enough hearing defects to impair learning in a classroom situation. One study revealed a student with a 50 per cent hearing loss listened quite well.

2. Listening is the process in which meaning is attached to the aural symbols perceived. Listening is the assimilation of aural plus visual cues.
 - a. To listen is to COMPREHEND - to enhance or understand a thing or idea.

SUMMARY: Hearing is the apprehension of sound and listening is the comprehension of aural symbols.

- B. Three qualifications are needed to make the definition of listening more meaningful.
 1. Silence itself must be accepted as an aural symbol. It permits the listener to digest or get ready for new material.
 - a. Much listening is done in intervals of silence.
 - b. Silence frequently carries meaning.
 2. Listening is not necessarily limited to the immediate speaking situations.
 - a. The meaning of symbols may start before anything is said and continue after the speaker stops speaking.
- C. The ability to read and listen seem to be related but at the same time are different.
 1. Arthur Heilman reports a .66 correlation between listening and reading.
 - a. Reading involves only visual cues while listening involves aural-plus-visual cues.
 - b. Assimilation through the ear is multidirectional while that through the eye must be focused.
 1. The ear is more sensitive than the eye, requiring a smaller amount of energy for activation.
 2. The ear appears to be much more durable than the eye with a much greater capacity for continuous use.
 2. Training in one communication skill does not usually result in a significant carry-over to another communication skill.
 3. Listening is a group or social activity--it involves social interaction, while reading is individualized.
 4. Listening demands considerable adjustment to a pace set by the speaker while the reader sets his own pace.

IV. What are some principles of listening which, when practiced, will aid you in becoming a sophisticated listener?

- A. A listener must be interested, and stay interested, in the topic to listen well.
 1. Good listeners somehow seem to find elements of interest in almost any topic and poor listeners frequently find a topic dry.

2. Watkins and Frost report ". . . ear specialists tell us that more than half of so-called deafness is nothing more than inattention."
3. A poor listener who lacks interest in his subject must try to be interested in the topic.
 - a. We hear what we want to hear, and fit it into our cognitive structure.
From a selfish viewpoint, a listener might consider these points:
 1. It is the easiest way to acquire needed information.
 2. It is the quickest way to grow culturally.
 3. It is the surest route to social maturity.
4. There are no uninteresting topics, only uninterested people listening.
- B. An effective listener does not over-criticize the speaker, speech, situation, etc.
 1. The burden of the responsibility of getting the communication through belongs to the speaker and the listener - it is a two-way street.
 2. Learning for the listener is "inside action," based upon what the listener has perceived.
 3. The listener should try to stimulate the speaker.
 - a. Try to build his confidence to encourage him to speak his ideas.
 4. Good listeners know that speakers and audience share responsibility for the success or failure of a speech.
- C. The listener must not expend too much or too little energy; he must not fake attention.
 1. Effective listening is characterized by increased heart action, faster circulation of the blood, even slightly increased body temperature.
 2. Attention can be described as a collection of tensions within the learner or listener which can best be reached only by getting messages related to them from the speaker.
 3. Suggestions:
 - a. Come physically prepared (rested) to be able to listen to the speaker.
 - b. Concentrate on what is being said.
 - c. Give prior thought to topic; students begin listening too late.
 - d. We must behave like listeners. Involvement in correct habits will frequently produce the desired behavior pattern.
- D. Effective listening is a philosophy or way of thinking that suggests an open-mind and an objective point of view. The effective listener adjusts to strain-laden words by:
 1. Identifying the words and listening to them.
 2. Analyzing the reasons why the word influences him as it does.
 3. Rationalizing the impact of the words upon us by dis-

cussing them with others.

- E. The effective listener learns to adjust more quickly to emotion-rousing points (overstimulation) than the poor listener.
 - 1. Good listeners tend to wait until they fully understand a point before attempting to judge it.
 - 2. Poor listeners have less emotional control in responding to a listener or idea that has disturbed them.
- F. The effective listener recognized the main points or central ideas.
 - 1. Lee found that only about 25 per cent of the persons listening to a speech got the central idea.
- G. The effective speaker utilized notes only when there is a specific reason for taking them.
 - 1. Paul McClendon's study on the relationship between note-taking practices and listening comprehension, revealed listening comprehension was not effected by any form of note-taking.
 - a. Listening comprehension is effective when students were not permitted to take notes.

APPENDIX H
LISTENING PURPOSE OUTLINE

LISTENING PURPOSE OUTLINE

With the exception of the first point taken from the introduction of Kibler's "easy" listening message, the following outline is taken directly from him.

Numbers following items in the outline indicate the test question which tested that item. The test is recorded in Appendix L.

- I. Listening is important.
 - A. Listening is the communication skill most frequently used. 14
 - B. We listen three times as much as we read. 20
- II. We should study listening.
 - A. Most people remember only 25% of the information in a speech. 6
 - B. Training in listening improves our understanding. 16
 - 1. 1400 Michigan State students improved 9-12% from training in listening. 24
 - 2. Poor listeners with high I.Q.'s improve rapidly from training. 17
 - 3. Pilots improve from training. 1 & 13
 - a. They learn to stress certain habits. 1 & 13
 - b. They reduce the repetition of messages. 1 & 13
 - c. They act more quickly in flight. 1 & 13
 - d. They act more accurately in flight. 1 & 13
 - C. Training affects individual differences. 16
 - 1. Best listeners are normally 6 times as effective as worst listeners. 2
 - 2. After training these differences are reduced. 16
 - D. Training reduces bad listening habits. 16
- III. Listening is defined as the process of attaching meaning to the aural and visual symbols of a speaker. 22
- IV. Listening involves two kinds of aural symbols.
 - A. The tone of our voice is an aural symbol. 26
 - 1. It has meaning. 26
 - 2. We listen to it. 26
 - B. Silence is an aural symbol. 3
 - 1. It has meaning. 3
 - 2. We listen to it. 22
- V. Listening is different from hearing.
 - A. Hearing is the perception of sound through the senses. 11 & 23
 - B. Listening requires the application of meaning to sound and silence. 11 & 23
 - C. Hearing acuity is not related to listening ability. 11 & 23

VI.	Listening is related to reading.	12
A.	Both listening and reading involve the use of the eye.	18
B.	Both listening and reading involve visual symbols.	18
VII.	Listening is different from reading.	12
A.	Listening involves the ear while reading does not.	27
B.	Listening is social, reading is individualized.	27 & 21
C.	Listening rate is controlled by the speaker, reading rate is controlled by the reader.	27 & 8
D.	Training in listening does not carry over to reading.	27 & 8
VIII.	There are six ways that listening can be trained outside the classroom.	
A.	Think about listening.	5
B.	Prepare to listen.	19
C.	1. Be rested.	7
	2. Give prior thought to the topic.	7
C.	Get interested in the topic.	28
	1. Half of deafness is disinterest.	15
	2. To fake attention violates this principle.	28
D.	Do not over-criticize the speaker.	25
E.	Recognize main points.	10
	1. 25% of people do not recognize main points.	29
F.	Summarize as you go.	4

APPENDIX I

TRADITIONAL LISTENING SPEECH

TRADITIONAL LISTENING SPEECH

"The human mind functions well"--until you get up to give a speech. Most of you in Speech 401 appreciate this remark, because you have experienced some anxiety in this speech class. But how many of you function effectively when you're not speaking--when you're listening?

We're going to spend about ten minutes together today trying to understand the listening process. As you might suspect, listening is the communication skill that is most frequently used today. Chances are, you listen three times as much as you read. Yes, even you who are over-talkative do this. Yet in schools, listening receives less than one-sixth as much emphasis.

We will consider three questions. (1) Why study listening? (2) What is listening? (3) What are some principles of listening which, when practiced, will aid you in becoming a more capable listener?

Most of us are pretty poor listeners. For example, you will probably not remember more than 25% of the information in this speech. Listen carefully, and maybe you can make me eat my words.

Start right now! We've uncovered three points in the last 60 seconds. First, listening is the most-frequently-used communication skill. Second, it is emphasized less than one-sixth as much as reading in schools, and is used three times as frequently. Third, you will only remember about 25% of the information I give you.

But you still want to know, "Why study listening?" Your grades

are based on tests over lectures. Studies reveal training in listening increases comprehension and understanding.

Dr. Charles Irvin tested 1,400 Michigan State college freshmen before and after listener training. Poor to above-average listeners before training improved the most. Listening-trained students improved 9-12 per cent, 9-12 per cent, over non-listening-trained students. Listening does improve through training.

In another study, Dr. Arthur Heilman gave students a listening test. Next, they were taught six lessons in listening. Then, they took a second listening test. Students receiving listening training improved greatly over students without training.

How about outside the classroom? In outside listening situations, listening-trained students were superior. Johnson and Haugh also note listening improvement through training.

How about practical training? Forrest Whan reported pilots with listening training reduced the number of messages repeated. Pilots trained to adapt to the listener in various flying conditions acted more quickly and more accurately in tests. Remember, listener training reduced repetition of messages by pilots, and helped them act more quickly and more accurately in flight.

Another reason for studying listening is the wide differences in listening ability. Dr. Jones' Columbia study showed high scores were about six times--get that, six times--higher than the lowest scores. Dr. Paul Rankin's work supports these findings.

What's the point? Simple! Most students benefit from listening

training. Reducing wide differences in listening ability produces more effective communication.

Doesn't listening ability develop without special training?

No! Rankin concluded listening ability doesn't develop adequately for life-needs without special training. Dr. Ralph Nichols states daily practice doesn't eliminate need for training. Practicing the same faults is falsely assuming that practice makes perfect. Why study listening? Listening abilities are taught--not caught.

But they're not taught enough in formal education. Nichols believes it is considered by all, but really taught by none. Since the responsibility belongs to no one, no one teaches listening. An English teachers' survey showed listening was one of the most important skills that needs to be taught. Why study listening? Teachers think it needs to be taught--formally.

Have we answered, "Why study listening?" Yes! We showed that listening ability is learned and improved through training; that comprehension and understanding improve through listening training; that wide differences in listening ability exist and training shortens the gap; that listening doesn't usually develop adequately without training; and that teachers believe it should be studied formally.

Now, what is listening? Listening is comprehending. Listening occurs when meaning is attached to aural symbols or words that we hear--we understand. Listening is a process--an ongoing, dynamic activity.

To define listening meaningfully, silence is accepted as an aural

symbol. I mean AURAL, aural. Silence has meaning. Ever ask for a date and get silence? It had meaning. Listeners digest or prepare for new ideas during silence. Much listening occurs during silence.

Remember, listening isn't limited to immediate speaking situations. Word meanings may start before and continue after talk. Let's say you quarreled with a friend last night. Next day you walk silently toward class together. The silence has meaning.

Are hearing and listening the same? No! Hearing is focusing on or becoming aware of sound through the senses. Hearing defects reduce classroom learning for only 3-6% of the nation's children. Listening is adding meaning to sound symbols or words.

Are reading and listening the same? No! They are related; but not the same. Heilman found a .66 or moderate relationship between listening and reading. Reading is a visual activity. Nichols states, listening is an aural--or ear--plus a visual activity.

Ear and eye activity differ. Ear activity is multidirectional. Eyes require focusing. You can listen to me from all sides; you must focus your eyes on me to see me. Ears are more sensitive than eyes. Ears require less energy to activate them, are more durable than eyes, and have greater capacity for continued use. Long movies may make your eyes hurt; but do your ears?

Reading and listening differ, because listening is a social activity. Reading is individualized. The reader sets his own pace. Listening requires other people, interacting--it's social. In listening

the speaker sets the pace. Read as fast as you wish, but you can listen only as fast as the speaker speaks--it's social.

Good readers aren't necessarily good listeners. Training in one skill doesn't carry-over to another skill. Reading and listening, then, are related, but not the same.

In summary, listening is comprehending through the ear by attaching meaning to words or symbols. Silence has meaning and is an aural symbol. Listening is related, but not the same as hearing or reading. Listening is a social process that is not limited to speaking situations.

Our last and most important question is, "What can we do to listen better?" First, think about listening. It is not an automatic process. We know that reading, writing, and speaking require energy and thought, so does listening. So think about listening; don't just "do it." All the rest of these suggestions assume that you accept the first one; to think about listening.

Second, prepare to listen. We can not start any complex activity without preparation. Listening preparation involves two steps. (A) Be rested when you listen. Sleeping through class may be an art, but not as productive an art as listening. (B) Give prior thought to the topic. We can give meaning to symbols only to the extent that we have experience with them. Giving prior thought to the topic is a way of marshalling your experience.

Third, get interested in topics--be attentive. Good listeners find interest in most topics; poor listeners find topics dry. Create

interest by selfishly realizing listening is an easy way (1) to get information; (2) grow culturally; (3) to mature socially.

There are no uninteresting topics, only uninterested listeners. You listen to what you want to listen to. Watkins and Frost state over half of deafness is really inattentiveness. A very bad way to get interested is to fake attention. Seniors fake attention well. Effective listeners increase heart action, blood circulation, and body temperature when listening. Do you? Nichols states attention is a collection of inner tensions satisfied when related messages are received from the speaker.

Fourth, don't over-criticize the speaker, speech, or situation; stimulate him. Build his confidence. Listener and speaker share responsibility for successful speech--it's a two-way street. Listening is inside-action, no one else does it for you. Help the speaker, don't over-criticize.

Fifth. Recognize main points. Lee found only 25% of the listeners recognize main ideas.

Sixth, and finally, summarize as you go. By self-summary we can make the relationships among ideas clearer. As a result we are less likely to go around with disconnected bits and pieces of material. Summarize as you go.

In closing, let's review main points. First, why study listening? Listening is learned and improved through training. Wide differences in listening ability exist, and improved with training.

Wide differences in listening ability exist. Listening doesn't usually develop adequately without training.

Second, what is listening? Listening is comprehending through the ear and attaching meaning to words and symbols. Silence has meaning. Listening is a social process not limited to speaking situations.

Third, how can we listen better? We can think about listening; prepare to listen; get interested in topics; not over-criticize the speaker; recognize main points; and summarize as we go.

APPENDIX J

LISTENING PROGRAMMED SPEECH WITH CHANGES
FOR REVISED PROGRAMMED SPEECH

LISTENING PROGRAMMED SPEECH WITH CHANGES
FOR REVISED PROGRAMMED SPEECH

In the following manuscript the original listening programmed speech is presented in normal type, triple spaced. Symbols indicate the kinds of revisions made in the development of the revised programmed speech. Words which are added or substituted in the revised form are entered above the original form in upper case letters.

Each change involves three notations. A capitalized letter indicates the kind of change made: i.e. X means deletion, R means revision, and A means addition. All words involved in the change are underscored.

A lower case letter indicates the reason for the change.

"a" refers to an elimination of words which seemed unnecessary and which did not directly repeat a test item. These changes were made by deletions (X) and revisions (R).

"b" refers to a change in the text which increased the parallelism between the text and the test. These changes were made with all three of the above kinds (A, R, X).

"c" refers to provision for increased emphasis on items. These changes were made by use of additions (A).

"d" refers to the removal of material on easy items. These changes were made by deletions (X) and revisions (R).

"e" refers to changes made in organization because of audience remarks.

"f" refers to a revision made to add interest.

"g" refers to revisions and additions made to increase explicitness.

"h" refers to revisions made to retain consistency with previous changes.

PROGRAMMED SPEECH WITH INDICATIONS OF CHANGES
FOR REVISED PROGRAMMED SPEECH

Most of you give careful attention to what you are doing when you stand up to give a speech. But people seldom question their effectiveness when not speaking - when they are listening.

We're going to spend about ten minutes trying to understand the listening process. Would you guess that we listen more than we speak? /We do./ Listening is the communication skill that is most frequently used today. Chances are, you listen three times

as much as you read. Xa-1 Yes, even you who are over-talkative do

this. Have^x you been listening? Do we normally read or listen more? /Listen more./ How much more? /Three times as much./

Xa-2 Listening affects your grades. Do you learn from listening to other students? When you cut class, does listening help you find out what happened? Do you decide how to approach a class and an instructor partly by listening? Does listening about courses determine which class you take in some cases? /Audience will

respond to these questions, but they will be self-reinforced.^x

But, ^{Xa-3} you still want to know ^x "Why study listening?"

^{Xa-4} ^{x WE DEPEND}
We have already considered our dependence upon listening for

college success. Yet, most of us are pretty poor listeners. For example, most of you will probably not remember more than

^{Rb-5 25%} ¹/₄ of the information in this speech. ^{Xa} Listen carefully,

maybe you can make me eat my words.^x What per cent of information

will you probably remember? /25%/

If training in listening improves our comprehension and understanding, then we have a good reason to study it. Training, in fact, does increase comprehension and understanding.

Fourteen hundred Michigan State college freshmen were tested before and after listening training. Training improved listening 9-12% - that's about 1/10. Listening does improve through training. If you take a listening course, how much could you expect to improve? /9-12%./

In another study, Dr. Arthur Heilman gave students a listening

Xa-7 test. xTHEN Next, they were taught six lessons in listening.

Xa-8 ANOTHER x Then, they took a second listening test. Students who were trained improved greatly. Poor listeners with high I.Q.'s improved more than other groups. Are you still listening? /Poor listeners with high I.Q.'s/

How about practical training? Forrest Whan reported pilots with listening training AB-9 LEARNED TO STRESS CERTAIN SPEECH AND reduced the number of messages LISTENING HABITS. THEY repeated. Pilots trained to adapt to the listener in various flying conditions acted more quickly and more accurately in flight. Remember, listener training Rb-10 (1) STRESS CERTAIN HABITS, (2) REDUCE reduced repetition of messages by REPETITION OF MESSAGES, (3) ACT MORE QUICKLY AND ACCURATELY IN FLIGHT. pilots, and helped them act more quickly and more accurately in flight. r flight.

Another reason for studying listening is the wide differences in listening ability. Dr. Jones' Columbia study showed high scores were about six times - get that - six times - higher than the lowest scores. Xb-11 If the worst listener here remembers 7% of the information presented, how much would the best listener remember according

to this study? /42%/^x After training, individual differences would be greatly reduced.

Now recall the 2 benefits gained by the pilots from listening training. What were they? Rb-12 CERTAIN HABITS STRESSED, FEWER /Fewer repeated messages and actions MESSAGES REPEATED, QUICKER AND MORE ACCURATE IN FLIGHT. that were quicker and more accurate in flight.^r

Ra-13 FURTHERMORE, LISTENING ABILITY DOES NOT DEVELOP Doesn't listening ability develop without special ADEQUATELY WITHOUT SPECIAL TRAINING. training? No! Rankin concluded that listening ability does not

develop adequately without special training. Dr. Ralph Nichols

states daily practice doesn't eliminate need for training.^r We

often practice bad habits when we listen. Do you judge that prac-

ticing a bad habit strengthens or weakens it? /Strengthens it./

Ac-14 SINCE WE FREQUENTLY PRACTICE BAD HABITS, WE NEED TO BE TRAINED.^r

Rg-15 DETAILS
Let's review the main ideas about training in listening.

Xa-16

How would you phrase the most important point that has been made? /Listening can be improved by training./^x How does training

affect individual differences in listening ability? /It reduces

Ac-17 HOW MUCH BETTER ARE THE BEST LISTENERS THAN THE WORST them./

LISTENERS? /6 times./ HOW MUCH DID THE MICHIGAN STUDENTS

GAIN FROM A COURSE IN LISTENING? /THEY IMPROVED 9-12%./_a

Now, what is listening? Re-18 WE SHALL DEFINE LISTENING FOR
Listening is understanding.

THE SPECIAL PURPOSES OF A SPEECH CLASS. r Listening is the process

of attaching meaning to aural and visual symbols of a speaker.

Suppose I say "aadvark gwumbug harlac." Look at the definition. What is missing? /Meaning.?

If I say Rf-19 "WHAT DO YOU THINK OF HER?" (SUGGESTIVE TONE)
"Will you please leave the room?" (Hostile

tone) you understand something different than if I say Rf-20 "WHAT
"Will

DO YOU THINK OF HER?" (HOSTILE TONE)
you please leave the room?" (polite tone) What part of this definition

covers the difference in meaning? /Aural symbols./

You can read a visual aid, but you cannot listen to it. What
is missing? /Aural symbols./

Ac-21 NOTE: THE TONE OF OUR VOICE IS AN AURAL SYMBOL. IT
HAS MEANING. WE LISTEN TO IT.

X-22

When you read you use only one sensory organ - the eye.

When you listen, what sensory organs do you use? /Ear and eye./^x

Ae-23 TO DEFINE LISTENING MORE COMPLETELY WE SHALL NOW

CONSIDER HOW IT IS RELATED TO SILENCE, HEARING, AND READING.

Xd-24

How many aspects are there to listening as we have

defined it? /Four: meaning, aural symbols, visual symbols, and

speaker./ We can improve each aspect through training. Complete

this sentence: if I took a course in listening I would study the

process of . . . /Attaching meaning to aural and visual symbols of

a speaker./^x Rb-25 FOR OUR PURPOSES, SILENCE IS AN AURAL SYMBOL AND

IS LISTENED TO. TO DEFINE LISTENING MEANINGFULLY, SILENCE IS

ACCEPTED AS AN AURAL SYMBOL.

Xd-26

Silence often had meaning.

Word

meanings may start before and continue after talk.^x Ever ask for a

date and get silence? It had meaning.^x Xd-27 Suppose you quarreled

with a friend last night. Next day you walk silently toward class

together. The silence had meaning. Think of a time that silence

made you unsure of yourself. Think of a time that silence made you

feel better.^x

From this definition of listening, would you guess that listening and hearing are the same thing? /No./ Hearing is the perception of sound through the senses. Listening involves giving meaning to sound and silence. Hearing acuity is not closely related to listening ability. Define hearing. /Hearing is the perception of sound./ When do we listen without hearing. /When we listen to silence./

Nor are reading and listening the same. They are related;

Ab&c-28 WHEN YOU READ YOU USE ONLY ONE SENSORY but not the same. When we referred to a visual aid we

ORGAN - THE EYE. WHEN YOU LISTEN WHAT SENSORY ORGANS DO YOU USE? mentioned an important difference between reading and listening.

/EAR AND EYE./ WE USE THE EAR FOR AURAL SYMBOLS; THE EYE FOR VISUAL What was the difference between listening and reading a visual aid?

SYMBOLS. THUS READING AND LISTENING ARE DIFFERENT SINCE LISTENING /There were no aural symbols./

USES THE EAR: AND THEY ARE RELATED SINCE THEY BOTH USE EYES.

Ear and eye activity differ. Ear activity is multidirectional.

Eyes require focusing. You can listen to me from all sides; you must focus your eyes on me to see me. Ears are more sensitive than eyes. Ears require less energy to activate them. They are more

durable than eyes, and have greater capacity for continued use.

Long movies may make your eyes hurt; but do your ears? List the

three differences between ears and eyes. /Ear is multidirectional--

eyes focus. Ear is more sensitive and durable./^r

There are three other differences between reading and listen-

ing. First, listening is a social activity. Reading is individual-

Rg-29 WHEN WE LISTEN WE ARE AWARE OF THE SPEAKER AND
ized. Listening requires other people interacting--it's

OFTEN OF THE OTHERS IN THE AUDIENCE. LISTENING IS SOCIAL.
social.

Second, in listening the speaker sets the pace. Read as fast

as you wish, but you can listen only as fast as the speaker speaks.

Third, good readers are not necessarily good listeners. Training

in one skill does not carry-over to the other skill. Reading and

Rg-30 ARE DIFFERENT, BUT RELATED.
listening, then, are related but not the same. I have listed

Rh-31 FOUR

three more differences between reading and listening. What

Rh-32 LISTENING USES THE EAR, LISTENING IS SOCIALIZED
were they? /Socialization, pace, transfer./

LISTENING PACE IS SET BY THE SPEAKER, TRAINING IN ONE DOES NOT

TRANSFER TO THE OTHER./

Now we will review the material on the nature of listening.

How was listening defined? /Listening is the process of attaching meaning to aural and visual symbols of a speaker./ How do hearing and listening differ? /Hearing involves perception of sound; listening involves attaching meaning to sound and silence./

Ra-33 TRAINING IN LISTENING NEED NOT BE IN A CLASSROOM

Since listening can be improved by training and since we have considered the nature of listening, it seems logical to consider ways we can train ourselves to listen better. For as in every other skill requiring training, listening training is most efficient with outside help. However, self-training is also well-worth the time and effort. We will now consider 6 ways we can train ourselves to listen more efficiently.

One. Think about listening. It is not an automatic process.

Rd-34 WE KNOW THAT READING, WRITING, AND SPEAKING REQUIRE ENERGY

Our writing is partly automatic, but we assume we must think AND THOUGHT, SO DOES LISTENING. about it. Listening is equally complex. We know that reading and

speaking require energy and thought, so does listening. So think

about listening; don't just "do it." All the rest of these

suggestions assume that you accept the first one. ^{Xf-35} Before anything else you must ^x think about listening.

Two. Prepare to listen. We can not start any complex activity without preparation. Listening preparation involves two steps.

A. Be rested when you listen. Sleeping through class may also be an art, but not as productive an art as listening.

B. Give prior thought to the topic. We can give meaning to symbols only to the extent that we have experience with them. Giving prior thought to the topic is a way of marshalling your experience.

Now we have just considered two ways to be prepared. What were they? /Be rested and give prior thought to the topic./ The first principle was most important. What was it? /Think about listening./

Three. Get interested in topics -- be attentive. Good

listeners find interest in most topics; poor listeners find topics

dry. Xd-36 There are no uninteresting topics, only disinterested

listeners. You listen to what you want to listen to. ^x Half of

deafness is inattentiveness. If you were unexpectedly tested on

many of your lectures, many of you would be classified as 50% deaf.

A very bad way to get interested is to fake attention. Many college

students fake attention and fool themselves. Restate this third

principle. /Get interested in the topic. What were the 2 steps in

preparation for listening. /Be rested. Give prior thought to the

topic./

Four. Don't over-criticize the speaker. The speaker is trying to make his aural and visual symbols say the same thing at the same time. Use your energy to try to find out what his meaning is supposed to be. Don't worry about mannerisms, peculiar expressions, etc.

Xd-37 All the energy used in excessive criticism is

energy you can't use to attach meaning. ^x What about this principle?

/Don't over-criticize the speaker./

Five. Recognize main ideas. Xd-38 The speaker should make

them particularly clear. Even if he doesn't, you find them. x

Rg-39 LEE DISCOVERED THAT ONLY 25% OF US, THAT'S 1 OUT OF 4,
Lee discovered that only 25% of us recognize main ideas.

RECOGNIZE MAIN IDEAS. Xd-40

By recognizing main ideas you keep

your mind from wandering over illustrations and analogies. What x

was this principle? /Recognize main ideas./ What was the principle

before this one? /Don't over-criticize the speaker./ What was the

first principle? /Think about listening./

Six, and finally, summarize as you go. By self-summary we

can make the relationships among ideas clearer. Xd-41 When we

remember one unit of information we're reminded of the rest. As x

a result we are less likely to go around with only bits and pieces

of material. Ac-42 SUMMARIZE AS YOU GO.

Now for a final summary. What was the last principle? /Sum-
marize as you go./ What principle dealt with the main parts of the

speech? /Recognize main ideas./ Which principle dealt with our reactions to the speaker? /Don't over-criticize./ Which principle dealt with our reactions to the speaker's topic? /Get interested in the topic./ Which principle was broken into two substeps? /Prepare to listen./

Ac-43 FINALLY, WHEN WE FAKE ATTENTION WE VIOLATE THE PRINCIPLE THAT WE SHOULD GET INTERESTED. TRAINING IN LISTENING SHOULD IMPROVE US 9 TO 12%. TRAINING REDUCES INDIVIDUAL DIFFERENCES, IMPROVES COMPREHENSION AND UNDERSTANDING, AND OVERCOMES BAD HABITS.

APPENDIX K
REPETITIVE LISTENING SPEECH

REPETITIVE LISTENING SPEECH

Most of you give careful attention to what you are doing when you stand up to give a speech. But people seldom question their effectiveness when not speaking - when they are listening.

We're going to spend about ten minutes trying to understand the listening process. Many of you may know already that we listen more than we speak. Listening is the communication skill that is most frequently used today. Chances are, you listen three times as much as you read. Yes, even you who are over-talkative do this. If you have been listening you already know we listen three times as much as we read.

Listening affects your grades. You learn from listening to other students. When you cut class, listening helps you find out what happened. You decide how to approach a class and an instructor partly by listening. In some cases listening about courses determines which class you take.

But you still want to know, "Why study listening?" We have already considered our dependence upon listening for college success. Yet, most of us are pretty poor listeners. For example, most of you probably will not remember more than $\frac{1}{4}$ of the information in this speech. Listen carefully, maybe you can make me eat my words. What percentage of information will you probably remember? 25%

If training in listening improves our comprehension and

understanding, then we have a good reason to study it. Training, in fact, does increase comprehension and understanding.

Fourteen hundred Michigan State College freshmen were tested before and after listening training. Training improved listening 9 to 12 per cent - that's about 1/10. Listening does improve through training. If you take a listening course, you could expect to improve 9 - 12 per cent.

In another study, Dr. Arthur Heilman gave students a listening test. They were taught six lessons in listening. Then they took a second listening test. Students who were trained improved greatly. Poor listeners with high I.Q.'s improved more than other groups. Are you still listening? Training in listening helps poor listeners with high I.Q.'s the most.

How about practical training? Forest Whan reported pilots with listening training reduced the number of messages repeated. They learned to stress certain speech and listening habits. Pilots trained to adapt to the listener in various flying conditions acted more quickly and more accurately in tests. Remember, listener training helped pilots (1) stress certain habits, (2) reduce repetition of messages, (3) act more quickly and accurately in flight.

Another reason for studying listening is the wide differences in listening ability. Dr. Jones' Columbia study showed high scores were about six times--get that, six times--higher than the lowest

scores. If the worst listener here remembers 7% of the information presented, the best listener will remember 42% according to this study. After training, individual differences would be greatly reduced.

Now review the three benefits gained by the pilots from listening training. They learned to (1) stress certain habits, (2) reduce repetition of messages, (3) act more quickly and accurately in flight.

Furthermore, listening ability doesn't develop adequately without special training. We often practice bad habits when we listen. As you probably judge, practicing a bad habit strengthens it.

Let's review the main ideas about training in listening. The most important point that has been made is that listening can be improved by training. Training affects individual differences in listening ability by narrowing the gap. We do not normally improve our listening without training.

Now, what is listening? Listening is the process of attaching meaning to aural and visual symbols of a speaker.

Suppose I say, "Aadvark gwumbug harlac." Look at the definition. Note that meaning is missing.

If I say, "Will you please leave the room?", (hostile tone) you understand something different than if I say "Will you please leave the room?" (polite tone). In this definition, aural symbols cover the difference in meaning.

You can read the visual aid, but you cannot listen to it.

Aural symbols are missing.

Thus, there are four aspects to listening as we have defined it: meaning, aural symbols, visual symbols, and the speaker. We can improve each aspect of listening through training. If you took a course in listening you would study the process of attaching meaning to the aural and visual symbols of a speaker.

To define listening meaningfully, silence is accepted as an aural symbol. Silence often has meaning. Word meanings may start before and continue after talk. Ever ask for a date and get silence? It had meaning. Suppose you quarreled with a friend last night. Next day you walk silently toward class together. The silence has meaning.

As you would probably guess from this definition of listening, listening and hearing are not the same. Hearing is the perception of sound through the senses. Listening involves giving meaning to sound and silence. Hearing acuity is not closely related to listening ability. So, hearing is the perception of sound. Listening gives meaning to sound. We can listen without hearing when we listen to silence.

Nor are reading and listening the same. They are related; but not the same. We already noted that listening involves the ear as well as the eye.

Ear and eye activity differ. Ear activity is multidirectional. Eyes require focusing. You can listen to me from all sides; you

must focus your eyes on me to see me. Ears are more sensitive than eyes. Ears require less energy to activate them. They are more durable than eyes, and have greater capacity for continued use. Long movies may make your eyes hurt; but do your ears? In summary, the three differences between ears and eyes are that ears are multidirectional and require less energy than eyes, and ears have greater durability than eyes.

There are three other differences between reading and listening. First, listening is a social activity. Reading is individualized. Listening requires other people interacting - it's social. Second, in listening the speaker sets the pace. Read as fast as you wish, but you can listen only as fast as the speaker speaks.. Third, good readers are not necessarily good listeners. Training in one skill doesn't carry-over to another skill. Reading and listening, then, are related, but not the same. I have listed three more differences between reading and listening: listening is socialized, its pace is set by the speaker, training in it does not transfer to reading.

Now we will review the material on the nature of listening. Listening was defined as the process of attaching meaning to aural and visual symbols of a speaker. Hearing and listening differ since hearing involves perception of sound; listening involves attaching meaning to sound and silence.

Listening training need not be in the classroom. We will now

consider six ways in which we can train ourselves to listen more efficiently.

One. Think about listening. It is not an automatic process. Our writing is partly automatic, but we assume we must think about it. Listening is equally complex. We know that reading, writing and speaking require energy and thought, so does listening. So think about listening; don't just "do it." All the rest of these suggestions assume that you accept the first one. Before anything else, you must think about listening.

Two. Prepare to listen. We cannot start any complex activity without preparation. Listening preparation involves two steps.

A. Be rested when you listen. Sleeping through class may also be an art, but not as productive an art as listening..

B. Give prior thought to the topic. We can give meaning to symbols only to the extent that we have experience with them. Giving prior thought to the topic is a way of marshalling your experience.

Now, we have just considered two ways to be prepared; namely, be rested, and give prior thought to the topic. The first general principle was most important. It was to think about listening.

Three. Get interested in topics -- be attentive. Good listeners find interest in most topics; poor listeners find topics dry. Half of deafness is really inattentiveness. If you were unexpectedly tested on many of your lectures many of you would be classified as 50% deaf. A very bad way to get interested is to fake attention.

Many college students fake attention and fool themselves. The third principle has been to be attentive.

Now, remember the two steps in preparation: be rested and give prior thought to the topic.

Four. Don't over-criticize the speaker. The speaker is trying to make his aural and visual symbols say the same thing at the same time. Use your energy to try to find out what his meaning is supposed to be. Don't worry about mannerisms, peculiar expressions, etc. This principle was to not over-criticize the speaker.

Five, recognize main points. Lee discovered that only 25%-- that's 1 out of 4--of us recognize main ideas.

Another summary - this principle was to recognize main points. The principle before this was, "Don't over-criticize the speaker." The first principle was to think about listening.

Six, and finally, summarize as you go. By self-summary we can make the relationship among main ideas clearer. As a result we are less likely to go around with disconnected bits and pieces of material.

Now, a final summary. The last principle was to summarize as you go. The most important one was to think about listening. The principle which was broken into two substeps was to prepare to listen. The principle which dealt with our reactions to the speaker's topic was to get interested. The principle which dealt with our reaction to the speaker was "Don't over-criticize the speaker."

APPENDIX L

REVISED REPETITIVE LISTENING SPEECH

REVISED REPETITIVE LISTENING SPEECH

Most of you give careful attention to what you are doing when you stand up to give a speech. But people seldom question their effectiveness when not speaking - when they are listening.

We're going to spend about ten minutes trying to understand the listening process. Many of you may know already that we listen more than we speak. Listening is the communication skill that is most frequently used today. Chances are, you listen three times as much as you read. If you have been listening you already know we listen three times as much as we read.

But "Why study listening?" We depend upon listening for college success. Yet, most of us are pretty poor listeners. For example, most of you probably will not remember more than $\frac{1}{4}$ of the information in this speech. Listen carefully, maybe you can make me eat my words. What percentage of information will you probably remember? 25%.

If training in listening improves our comprehension and understanding, then we have a good reason to study it. Training, in fact, does increase comprehension and understanding.

Fourteen hundred Michigan State College freshmen were tested before and after listening training. Training improved listening 9-12% - that's about 1/10. Listening does improve through training. If you take a listening course, you could expect to improve 9-12%.

In another study, Dr. Arthur Heilman gave students a listening

test, then six lessons in listening, then a second listening test. Students who were trained improved greatly. Poor listeners with high I.Q.'s improved more than other groups. Are you still listening? Training in listening helps poor listeners with high I.Q.'s most.

How about practical training. Forest Whan reported pilots with listening training reduced the number of messages repeated. They learned to stress certain speech and listening habits. Pilots trained to adapt to the listener in various flying conditions acted more quickly and more accurately in tests. Remember, listener training helped pilots (1) stress certain habits, (2) reduce repetition of messages, (3) act more quickly and accurately in flight.

Another reason for studying listening is the wide differences in listening ability. Dr. Jones' Columbia study showed high scores were about six times -- get that, six times -- higher than the lowest scores. After training, individual differences would be greatly reduced.

Now review the three benefits gained by the pilots from listening training. They learned to (1) stress certain habits, (2) reduce repetition of messages, (3) act more quickly and accurately in flight.

Furthermore, listening ability doesn't develop adequately without special training. We often practice bad habits when we listen. As you probably judge, practicing a bad habit strengthens it.

Since we frequently practice bad listening habits, we need to be trained.

Let's review the details about training in listening.

Training affects individual differences in listening ability by narrowing the gap. The best listeners are 6 times as effective as the worst. Michigan State students improved their listening 9 - 12% by training.

Now, what is listening? We shall define listening for the special purposes of a speech class. Listening is the process of attaching meaning to the aural and visual symbols of a speaker.

Suppose I say, "Aadvark gwumbug harlac." Look at the definition. Note that meaning is missing.

If I say, "What do you think of her?" (admiring tone) you understand something different than if I say, "What do you think of her?" (Hostile tone) In this definition aural symbols cover the difference in meaning.

You can read the visual aid, but you cannot listen to it. Aural symbols are missing. Note: the tone of our voice is an aural symbol. It has meaning. We listen to it.

If you took a course in listening you would study the process of attaching meaning to the aural and visual symbols of a speaker.

To define listening more completely, we shall now consider how it is related to silence, hearing, and reading.

For our purposes, silence is an aural symbol and is listened to. Silence often has meaning. Word meanings may start before and

continue after talk. Ever ask for a date and get silence? It had meaning.

As you would probably guess from this definition of listening, listening and hearing are not the same. Hearing is the perception of sound through the senses. Listening involves giving meaning to sound and silence. Hearing acuity is not closely related to listening ability. So, hearing is the perception of sound. Listening gives meaning to sound. We can listen without hearing when we listen to silence.

Now are reading and listening the same. They are related; but not the same. When you read you use only one sensory organ - the eye. When you listen you use both the ear and the eye. We use ears for aural symbols, eyes for visual symbols. Thus reading and listening are different since listening uses the ear; and they are related since they both use eyes.

There are three other differences between reading and listening. First, listening is a social activity. Reading is individualized. When we listen we are aware of the speaker and often of the others in the audience. Listening is social. Second, in listening the speaker sets the pace. Read as fast as you wish, but you can listen only as fast as the speaker speaks. Third, good readers are not necessarily good listeners. Training in one skill does not carry-over to the other skill. Reading and listening then, are different, but related. Altogether I have listed 4 differences between reading and listening.

Listening uses the ear, listening is socialized, its pace is set by the speaker, training in it does not transfer to reading.

Now we will review the material on the nature of listening.

Listening was defined as the process of attaching meaning to aural and visual symbols of a speaker. Hearing and listening differ since hearing involves perception of sound; listening involves attaching meaning to sound and silence.

Listening training need not be in the classroom. We will now consider six ways in which we can train ourselves to listen more efficiently.

One. Think about listening. It is not an automatic process. We know that reading, writing and speaking require energy and thought, so does listening. So think about listening; don't just "do it." All the rest of these suggestions assume that you accept the first one. Before anything else, you must think about listening.

Two, prepare to listen. We cannot start any complex activity without preparation. Listening preparation involves two steps. (A) Be rested when you listen. Sleeping through class may also be an art, but not as productive an art as listening. (B) Give prior thought to the topic. We can give meaning to symbols only to the extent that we have experience with them. Giving prior thought to the topic is a way of marshalling your experience.

Now, we have just considered two ways to be prepared; namely, be rested, and give prior thought to the topic. The first general principle was most important. It was to think about listening.

Three. Get interested in topics.--Good listeners find interest

in most topics; poor listeners find topics dry. Half of deafness is really disinterest. If you were unexpectedly tested on many of your lectures many of you would be classified as 50% deaf. A very bad way to get interested is to fake attention. Many college students fake attention and fool themselves. The third principle has been to get interested in the topic.

Now remember the two steps in preparation; be rested and give prior thought to the topic.

Four. Don't over-criticize the speaker. The speaker is trying to make his aural and visual symbols say the same thing at the same time. Use your energy to try to find out what his meaning is supposed to be. Don't worry about mannerisms, peculiar expressions, etc. This principle was to not over-criticize the speaker.

Five, recognize main points. Lee discovered that only 25% - that's 1 out of 4 - of us recognize main ideas.

Another summary - this principle was to recognize main points. Seventy-five per cent of people do not recognize main ideas. The principle before this was "Don't over-criticize the speaker." The first principle was to think about listening.

Six, and finally, summarize as you go. By self-summary we can make the relationships among main ideas clearer. As a result we are less likely to go around with disconnected bits and pieces of material.

Now, a final summary. The last principle was to summarize as you go. The most important one was to think about listening. The

principle which was broken into two substeps was to prepare to listen. The principle which dealt with our reactions to the speaker's topic was to get interested. The principle which dealt with our reaction to the speaker was "Don't over-criticize the speaker."

Finally, when we fake attention, we violate the principle that we should get interested. Training in listening should improve us 9-12%. Training reduces individual differences, improves comprehension and understanding, and overcomes bad habits.

APPENDIX M

LISTENING SPEECH TESTS, PARTIAL ITEM SCORES AND
RELEVANT TEXTUAL CHANGES

LISTENING SPEECH TESTS, PARTIAL ITEM SCORES AND
RELEVANT TEXTUAL CHANGES

The following material is designed to show the types of changes made in relation to each test item and the scores of each item.

There are four columns following each question. The first column is headed "Unison" and shows the immediate recall score on the item in the original form on top and the immediate recall score in the revised form on the bottom. The second column shows the changes made in relation to the tested item.

The following material provides four kinds of information.

- (1) The original test and revised tests,
- (2) The immediate recall scores for each item with the original test and text,
- (3) The types and number of revisions,
- (4) The traditional Speech scores with the revised test.

The original test is recorded in normal type. Wherever a question or alternative answer was revised, the revised item is inserted below the original item in upper case letters.

In the first column to the right of the question immediate recall scores on the original form are provided for the unison and random speech forms.

In the second column to the right of the question the number and type of revisions are indicated. The symbols used for that column operate as follows:

- I. Capital letters refer to the kind of revision made.
 A refers to an addition.
 R refers to a revision, i.e. some words taken out, others added within single sentences or several sentences rephrased within a paragraph.
 X refers to an elition.

- II. Small letters refer to the purpose of the change.
 "a" refers to an elimination of words which seemed unnecessary and which did not directly repeat a test item. These changes were made by elitions (X) and revisions (R).
 "b" refers to a change in the text which increased the parallelism between the text and the test. These changes were made with all three of the above kinds (A, R, X).
 "c" refers to provision for increased emphasis on items. These changes were made by use of additions (A).
 "d" refers to the removal of material on easy items. These changes were made by elitions (X) and revisions (R).
 "e" refers to changes made in organization because of audience remarks.
 "f" refers to a revision made to add interest.
 "g" refers to revisions and additions made to increase explicitness.
 "h" refers to revisions made to retain consistency with previous changes.

- III. Numbers refer to the chronological position of the change.

A total of 21 changes are not recorded because they do not directly relate to a given test item. 17 of these changes reduced the number of words.

19 changes are recorded because they do directly relate to test items.

Test changes are indicated as follows: The original test item is provided in lower case letters. When a test question or answer was changed, the change is indicated by repeating the item immediately below the original in upper case letters.

Test item scores are indicated for the original L2, L1 and traditional speeches.

In the third column to the right of the question, immediate

recall scores for the random, unison and traditional speeches on the revised test are given.

INSTRUCTIONS: DO NOT MARK ON THE TEST BOOKLET! answer sheet to indicate which of the five choices is the most accurate.

NOTE: Many students miss 1 to 3 questions through carelessness.

	Re- vis- ions	Random Unison Traditional Scores
1. How did training in listening affect pilots?	Ab-1	84.70 R
1. The training reduced accidents.	Rb-2	94.64
2. Repetition of messages was reduced.		95.00 U
3. The pilots spoke more slowly and distinctly.		86.67
4. The pilots acted more slowly and more carefully.		100.00 T
5. All of the above.		92.59
2. How great are individual differences in listening?		
1. Highest scores are <u>twice</u> as high as the lowest scores.	Xi-3	60.00 R
2. Highest scores are <u>three</u> times as high as the lowest scores.		89.31
3. Highest scores are <u>four</u> times as high as the lowest scores.		68.89 U
4. Highest scores are five times as high as the lowest scores.		75.01
5. Highest scores are <u>six</u> times as high as the lowest scores.		58.61 T
		51.85
3. Which of the following statements is most acceptable in describing the relationship between listening and silence.	Rb-10	10.00 R
1. Listening and silence are necessarily limited to the immediate speaking situations.	Xa-11	82.61
2. Silence need not be accepted as an aural symbol.	Xa-12	91.11 U
3. Short periods of silence typically hinder the speaker from listening effectively.		90.74
4. Little listening is done in intervals of silence.		90.32 T
5. Silence frequently carries meaning since it is an aural symbol.		96.29

4. A main principle of effective listening is to Ac-18 65.00 R
 ONE OF THE SIX MAIN PRINCIPLES OF EFFECTIVE
 LISTENING IS TO
1. Summarize as you go. 91.81
 2. Rest before the speech. 44.44 U
 TRAIN YOURSELF TO LISTEN.
 3. Analyze the speaker's delivery. 83.93
 4. All of the above. 54.84 T
 TAKE NOTES.
 5. None of the above. 81.48
 LOOK INTERESTED.
5. The most important principle for listening Rd-34 90.00 R
 improvement was:
1. Concentrate as hard as possible on the Rd-35 86.96
 subject.
 2. Get plenty of rest before coming to class. 86.67 U
 3. Think about listening. 89.24
 4. Don't fake attention and fool yourself. 67.74 T
 5. None of the above. 66.56
 GIVE PRIOR THOUGHT TO THE TOPIC.
6. About what per cent of the information pre- Rb-5 65.00 R
 sented in a speech will a class remember if
 it is an average class?
1. 15% Rg-39 89.13
 2. 25% 80.00 U
 3. 35% 78.58
 4. 45% 100.00
 5. 50% 100.00
7. In order to be prepared to listen you were 30.00 R
 instructed to:
1. Be rested. 82.61
 2. Give prior thought to the topic. 48.89 U
 3. Get interested in the topic. 76.79
 THINK ABOUT LISTENING.
 4. Do both 1 and 3. 32.25 T
 5. Do both 1 and 2. 40.74
8. How are listening and reading related? Ab-28 75.00 R
1. Training in listening transfers to Ac-28 78.26
 reading, but the reverse is not true. Rg-30 75.56 U
 2. People with high listening scores have
 high reading scores.
 3. Listening speed is normally greater than 76.79
 reading speed.
 4. Listening speed varies with the audience. 61.29 T
 5. None of the above. 77.78
9. Which of the following statements is Ra-13 85.00 R
 accurate?

1. Since we frequently practice bad listening habits, we need to be trained.	Ac-14	91.31	
2. Since we frequently practice bad listening habits, we need to rely heavily on classroom notes.	Ac-17	84.44	U
3. As we mature our listening skills naturally improve with practice.	Ac-43	98.21	
4. Bad listening habits tend to remain fixed in spite of training.		87.10	T
5. Training in reading improves listening.		81.48	
10. To be efficient listeners you were instructed to:	Xd-38	95.00	R
1. Recognize the main ideas.	Xd-40	86.96	
2. Evaluate illustrations and analogies.		93.33	U
3. Relate the subject to your own experience.		98.21	
4. Be aware of contradictions.		83.87	T
5. Take notes legibly and carefully.		100.00	
11. Which of the following statements is <u>not</u> true concerning hearing?		75.00	R
1. Hearing is the perception of aural symbols.		67.39	
2. Hearing is becoming aware through senses. HEARING DOES NOT NECESSARILY INVOLVE MEANING.		80.00	U
3. Hearing acuity is not closely related to listening ability.		64.30	
4. Hearing is identified only with the perception of sound.		61.29	T
5. To hear is to understand. TO HEAR IS TO UNDERSTAND THE MEANING OF SOUND.		51.85	
12. Which of the following statements is true concerning listening and reading?	Abc-28	55.00	R
1. Reading and listening involve the same basic skills.	Rg-30	78.26	
2. There is a very close relationship between listening and reading.		55.56	U
3. Reading and listening are different, but related.		83.93	
4. Reading and listening are not related.		74.19	T
5. There is a negative relationship between listening and reading.		92.59	
13. Which of the following resulted from listening training for pilots?	Ab-9	60.00	R
1. Pilots were taught to adapt to the listener according to flying conditions. PILOTS REDUCED REPETITIONS OF MESSAGES.	Rb-10	81.43	

2. Pilots learned to stress certain habits.	Rb-12	60.00	U
3. Pilots responded more quickly.		82.15	
4. Pilots responded more accurately.		41.93	T
5. All of the above.		74.07	
14. According to this speech which of the following communication skills is most frequently used today?		95.00	R
1. Speaking		100.00	
2. Listening		82.23	U
3. Writing		92.86	
4. Reading		96.77	T
5. No one skill is used the most.		88.89	
15. What per cent of deafness is inattentiveness?		90.00	R
1. 10%		84.13	
2. 25%		93.39	U
3. 35%		83.93	
4. 50%		54.84	T
5. 65%		25.92	
16. Training in listening can be expected to	Ac-43	70.00	R
1. reduce individual differences.		58.70	
2. improve comprehension and understanding.		62.22	U
3. overcome bad habits.		62.51	
4. do all the above.		63.35	T
5. do none of the above.		51.85	
17. In the study done at Michigan State the greatest gain in listening ability was made by the		95.00	R
1. students who were in arts and sciences.		100.00	
2. poor students with high I.Q. scores.		91.12	U
3. students with pilot training.		100.00	
4. students over 20 years of age.		38.71	T
5. male students.		85.18	
18. Listening requires	Abc-28	80.00	R
1. all the sensory organs.		97.83	
2. both the eye and the ear.		66.76	U
3. only the ear.		90.74	
4. a high comprehension rate.		83.87	T
5. the ability to think rapidly.		62.96	
19. The principle of effective listening which involved two steps was:	Ac-43	70.00	R
1. Prepare to listen.		91.31	
2. Summarize as you go.		73.33	U
3. Find the main ideas.		89.20	
4. Get interested in the topic.		51.61	T
5. None of the above.		68.14	

20. How much time do we normally spend listening compared to reading? 95.00 R
1. We read twice as much as we listen. 100.00
 2. We listen and read about the same amount. 82.22 U
 3. We read three times as much as we listen. 100.00
 4. We listen three times as much as we read. 48.38 T
 5. We read one and a half times as much as we listen. 48.14
21. Which of the following statements is true? 10.00 R
1. Training in listening and reading do not transfer to each other.
GOOD READERS ARE NOT NECESSARILY GOOD LISTENERS. 82.61
 2. Listening speed does not depend on the listener.
IN LISTENING, THE SPEAKER SETS THE PACE. 51.11
 3. Listening is social, reading is not.
LISTENING IS SOCIAL, READING IS INDIVIDUAL. 90.74
 4. All of the above. 83.87 T
 5. None of the above. 89.18
22. Select the best definition of listening. Xd-24 95.00 R
1. Listening is the apprehension of sound assimilated through visual cues. 97.83
 2. Listening is identified with the perception of sound designed to reduce hearing defects. 93.39
 3. Listening and hearing are both based on attaching meaning to aural functions. 96.43
 4. Listening is understanding by attaching meaning to aural and visual symbols of a speaker. 35.48 T
23. Select the best statement that summarizes the relationship between listening and hearing. 100.00 R
1. Hearing is the perception of sound and listening is the comprehension of aural and visual symbols. 95.65
 2. Listening and hearing are both social processes. 95.56 U
 3. Listening ability is closely related to hearing acuity. 100.00
 4. Listening is identified as the perception of sound. 77.42 T
 5. Listening is a social process and hearing is a sociological activity. 92.59
- LISTENING AND HEARING ARE BOTH SOCIAL PROCESSES.

24. How much improvement did the Michigan freshmen realize through training in listening?	Ac-43	85.00 R
1. 5 - 8%		100.00
2. 9 - 12%		82.22 U
3. 13 - 16%		100.00
4. 17 - 20%		90.32 T
5. 21 - 24%		94.44
25. In responding to the speaker, listeners should	Xd-37	85.00 R
1. Critically note delivery.		91.13
2. Think of ways they would say the same thing.		93.39 U
3. Be careful not to over-criticize. NOT OVER-CRITICIZE THE SPEAKER.		83.93
4. Do all of the above.		54.84 T
5. Do none of the above.		85.18
26. The tone of our voice:	Ac-21	65.00 R
1. is an aural symbol.		76.09
2. has meaning.		77.78 U
3. is listened to.		82.15
4. all of the above.		74.19 T
5. none of the above.		70.37
27. Select the most accurate statement.	Rg-29	70.00 R
1. Listening, reading, writing, and speaking are group or social activities that involve social interaction. LISTENING, READING, WRITING, AND SPEAKING ARE SOCIAL.		91.31
2. Listening does not involve social interaction. LISTENING IS NOT SOCIAL.		51.11 U
3. Listening is a group or social activity that involves social interaction. LISTENING IS SOCIAL.		90.74
4. Listening is an individual activity. LISTENING AND READING ARE SOCIAL.		83.87 T
5. None of the above is accurate.		89.18
28. To fake attention violates the principle that we should:	Yd-34	85.00 R
1. Prepare for listening.	Ac-43	86.96
2. Summarize as you go.		77.78 U
3. Find the main ideas.		94.64
4. Get interested in the topic.		83.87 T
5. Be rested.		81.48

29. What per cent of people find the main ideas in a speech?	89.00 R
1. 5%	80.43
2. 15%	80.00 U
3. 25%	66.08
4. 40%	67.74 T
5. 50%	77.78
30. Training in listening can be expected to:	70.00 R
1. Improve reading speed.	71.74
2. Raise one's I.Q.	77.78 U
3. Improve reading comprehension.	67.74 T
4. Do all of the above.	77.78
5. Do none of the above.	74.07

APPENDIX N
SEMANTIC DIFFERENTIAL SCALE

INSTRUCTIONS: SEMANTIC DIFFERENTIAL SCALE

The purpose of this scale is to check some of the ways you may feel about the speech you have just heard. This test calls for checking a series of descriptive phrases on a 5-step scale. Read the explanation below before using the scales on the following page.

If you feel that the passage is very closely related to one end of the scale, mark either 1 or 5 on the answer sheet.

easy 1 2 3 4 5 difficult

easy 1 2 3 4 5 difficult

If you feel that the speech is quite closely related to one end of the scale, you should mark either 2 or 4.

good 1 2 3 4 5 bad

good 1 2 3 4 5 bad

If you consider the speech to be neutral on a scale, or if you think both sides of the scale are equally associated with the speech, or if the scale does not apply, mark number 3.

active 1 2 3 4 5 passive

- IMPORTANT: 1. Be sure you check every scale -- do not omit any.
2. Mark only one choice on each of the scales.

Work as fast as you can. Do not worry or puzzle over individual scales. Sometimes you may feel that you've had the same scale before. This will not be the case, so do not look back and forth through the scales. Do not try to remember how you checked any previous scales. Make each scale a separate and independent judgment.

We want your first feelings or impressions, so work quickly. On the other hand, please do not be careless because we want your true impressions.

NOTICE: The first scale on the following page is number 31.

BEGIN WITH NUMBER 31

31. good	1	2	3	4	5	bad
32. clear	1	2	3	4	5	unclear
33. interesting	1	2	3	4	5	uninteresting
34. consistent	1	2	3	4	5	inconsistent
35. vivid	1	2	3	4	5	dull
36. concise	1	2	3	4	5	wordy
37. pleasant	1	2	3	4	5	unpleasant
38. strong	1	2	3	4	5	weak
39. handy	1	2	3	4	5	awkward
40. efficient	1	2	3	4	5	wasteful
41. orderly	1	2	3	4	5	disorderly
42. successful	1	2	3	4	5	unsuccessful
43. difficult	1	2	3	4	5	non difficult
44. light	1	2	3	4	5	heavy
45. simple	1	2	3	4	5	complex
46. active	1	2	3	4	5	inactive
47. informal	1	2	3	4	5	stuffy
48. sharp	1	2	3	4	5	dull
49. personal	1	2	3	4	5	impersonal
50. easy	1	2	3	4	5	hard
51. adequate	1	2	3	4	5	inadequate
52. sure	1	2	3	4	5	unsure
53. precise	1	2	3	4	5	vague
54. slow	1	2	3	4	5	quick
55. unity	1	2	3	4	5	disunity
56. organized	1	2	3	4	5	unorganized

APPENDIX O
TEST EVALUATION FORM

TEST EVALUATION FORM

I am attempting to find out if these questions can be answered from the text and if the alternative answers are reasonable.

The questions are ordered according to the text. Circle the correct answer as indicated in the text. Then rate the question according to the following criteria. Place the rating in the right hand margin of the test question.

Intent of the question is clear	1	2	3	Intent of the question is unclear
Alternatives are meaningful	1	2	3	Alternatives are not meaningful
Question is easy	1	2	3	Question is difficult

Finally, if some element of the question seems particularly strong or weak, insert appropriate adjectives in the white space to the right of the answers.

EXAMPLE 1

98. Research methods used in the study of Speech include
- 1. The historical method
 - 1 2. The experimental method.
 - 1 3. The creative method.
 - 3 4. All of the above.
 - 5. None of the above.

(This question has been rated extremely clear, extremely meaningful, and moderately easy.)

EXAMPLE 2

98. Research methods used in the study of Speech include
- 1. Monkeyshines.
 - 5. 2. Deep, serious, penetrating thought.
 - 5. 3. The most appropriate method for the problem under study.
 - 1 4. All of the above.
 - 5. 5. None of the above.

(This question has been rated extremely unclear, not meaningful, and extremely easy.)

AUTOBIOGRAPHY

I, Charles Otto Tucker, was born October 29, 1932, in Moscow, Idaho. I received a Bachelor of Science degree from Southern Illinois University in 1954. After two years of Army Service in Germany, I did one summer of graduate work in Dramatics at the Southern Illinois University Summer Stock Theater. The academic year 1956-1957 I taught American History and coached debate at Evergreen Park High School in Evergreen Park, Illinois. While teaching on an assistantship, I obtained a Master's degree in Speech at the University of Oklahoma in 1958. The following three years I taught general speech courses and coached all forensic activities at Bradley University. From 1961 through Spring, 1963, I worked toward the Ph.D. at Ohio State University. I was granted a research assistantship in 1961-1962 and a teaching assistantship in debate in 1962-1963. Work for the degree was completed in June, 1963.