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THE NATURE OF SENTENTIAL BONDS
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THEIR RELATIONSHIP TO RECOGNITION AND RECALL

DISSERTATION
Presented in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

by
Edward E. Swingle, M.A., B.A.

The Ohio State University
1972

Approved by
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ACKNOWLEDGMENTS

Special thanks is given to the Speech Departments of The Ohio State University and Akron State University for furnishing subjects for the experiments conducted in this study.
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CHAPTER I

INTRODUCTION AND OVERVIEW

There is a term that appears in the literature of psychology, linguistics, and speech that denotes a series of sentences that are so related to one another that they appear logically, rationally, and psychologically connected or related. This term is connected discourse, a generic term for such communicative forms as speeches, essays, conversations, and similar forms. The term, connected discourse, distinguishes such utterances as words and isolated sentences from sentences that bear some type of relationship to each other. It is also a useful term in distinguishing linguistic research that is based on the syllable, word, and/or sentence from research that is based on a series of related sentences.

The term connected discourse implies that something connects or bonds various sentences into a coherent whole. When we read an article or listen to a speech we have a feeling that the sentences are related. Organization, structure, transitions, concepts, repetition, word associations, meaning, paragraph structure, and connectives are some of the devices that are thought by
many authors to contribute to coherence of a series of sentences and, by implication, to retention of material contained in such sentences.

It is useful and necessary to discriminate among devices that operate over the entire unit of connected discourse from those that operate between sentences or within the paragraph. Such typical devices as putting topic sentences in chronological or spatial order serve to unite the topic sentences together, but do little to explain how the individual sentences are united. Mental or conceptual sets fall into the same category. Thus, the author who states in an opening paragraph that the material that is to follow is evidence to support certain issues is organizing the paragraph, not the sentences within the paragraph. On the other hand, the use of such words as "thus," "merely," "but," etc., the order of sentences, repetition of words and phrases, and other devices serve to bind the individual sentences together.

Menzel recognizes this distinction when he talks about "intersentence syntax" as being something different from "interparagraph syntax."¹ Whorf also recognizes the existence of sentence relationship; he calls them

"intersentential linkages." This fact is of some importance: the failure to make this distinction may be the basis for the conflicting results in empirical studies of organizational structure. In other words there are various levels of organizational structure.

It is difficult to select a generic term for the devices that unite a series of sentences together or for the condition of their being united. There is no generally accepted term. It seems inexact to refer to them as intersentential syntax when neither a theory or body of knowledge exists for such a syntax. The term or phrase that will be used in this study is sentential relationship; for the devices that cause this relationship to exist, sentential bonds.

Not many studies deal directly with sentential relationships in connected discourse; many more deal with organization or organizational structure. Some of these will be discussed in Chapter II. The most important thing about them is that the findings are not consistent. Some have found organizational structure to be significant in relation to retention; others have not shown organization to be significant.

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This present study will deal with sentential relationships that exist within the paragraph or between sentences. Three aspects of them will be studied. First, commonality or redundancy between sentences; second, differentiation between sentences and its function in grouping sentences; and third, phonological devices that may help to relate a series of sentences. These three aspects of sentential relationships will be studied in relation to recognition of material, recall of material, and to reading time.

There is some question as to whether additional effort should be expended in the study of this question. Differences in retention from hearing and reading connected discourse are slight and, admittedly, many different aspects of organizational structure have been studied. There are three reasons why the study of sentential relationships needs to be studied.

First, it is of current interest in many areas. Bormuth's "Children's Comprehension of Between and Within Sentence Syntactic Structure," is based partly on sentential relationships.\(^3\) Jacobson's "A Modifiable Routine for Connecting Related Sentences of English Text" uses such

material. Harris' "Discourse Analysis" is an attempt to formalize in linguistic terms the relationship of sentence to sentence on the basis of commonality between sentences. El-Okby's "Verbal Cues of Organizational Information in Message Decoding" uses such intersentential devices as the main factors in organizing a series of sentences together in conversational speech. Granted, such studies are not plentiful, but they do suggest that intersentential relationships possess practical and theoretical implications.

Second, empirical research on organizational structure, of which sentential relationships might be considered a part, is conflicting in its results. Some studies have indicated that organization is important; others have not. This has led Thompson in his survey of

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literature to conclude: "Disorganization appears to affect comprehension in written communication, but effects upon comprehension and effectiveness in oral communication are doubtful." Again, he writes: "Perhaps in speech making the problem is not so much the ordering of the units [paragraphs] as it is the clarity of thought and expression of the individual parts." Petrie in his review of the literature reaches much the same conclusion. The important point is that empirical studies of organization have not shown consistent results and it is, perhaps, almost axiomatic that research begins at such a point.

Third, there is some indication that the matter is of fundamental importance. Bormuth writes:

The most startling result was the fact that large proportions of the children were unable to demonstrate a comprehension of even these basic structures [intersentenoe and anaphoric structures] by which information is signaled indicating that this deficiency may constitute a serious impediment to the efficiency of instruction. Thus, Bormuth feels that communication skills may be deficient in children because of a lack of understanding of

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8 Ibid., p. 68.
10 Bormuth, "Children's Comprehension of Between and Within Sentence Syntactic Structures," 353-354.
such relationships. Certainly, not much has been written about them. If Bormuth is correct, and there is experimental evidence that he is, then the matter is of fundamental importance.  

Augmenting this point of view is the fact that readability studies have based their research on certain aspects of the word and sentence; they have ignored the relationship of sentences and the linguistic devices that bring them about as a factor of reading ease.

The most important reason for the study of intersential relationships is that they might be capable of bringing about a whole new way of looking at organization and organizational structure, even at the paragraph level. Menzel suggests that they may be the only way of objectively identifying the topic sentence.

This study will, of course, consider each of these matters more fully in the review of the literature and attempt to test some intersential relationships for their effect on comprehension or recognition, recall, and reading time for an oral and written message.

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11 Bormuth, "Children's Comprehension of Between and Within Sentence Syntactic Structures," 353-354.


CHAPTER II

REVIEW OF LITERATURE

There is not much experimental research on informative speaking and writing. When one narrows this down to the topic of this study, the relationship of sentential bonds to coherence and comprehension, the number is small. Although much material has been written for the aid of student writers and speakers; most of it is untested and unproven. This is not to say that it is wrong or incorrect, merely that it has not been tested in an empirical fashion.

Oddly, extensive research in readability is almost devoid of studies based on the structure of written material. Most, if not all, readability studies are based upon word length, word rarity, sentence length, and as such are not indices of intersentence structural difficulty. For instance, the Flesch formula on readability is based on average word length in terms of syllables and average sentence length in terms of words.¹ As such it is

not a description of intersentential structure. The Dale-Chall formula is based on vocabulary load and sentence structure. These two factors cannot be considered a description of intersentential structural difficulty. Klare has presented a rather complete review of readability formulas and none seems to be based on aspects other than the word or sentence.

The field of Speech has long been interested in the area of public address which is, of course, a formal type of connected discourse. The area of listenability can be considered as studies in informative speaking. Only a few, however, are concerned with the relationship of structure or organizational structure to retention of material. These will be reviewed later in this chapter.

The following survey of literature will be divided into three sections: first, a survey of literature to find what theorists believe to be the devices that connect or relate one sentence to another; second, a review of experimental literature in the area of organization to determine how and if sentential relationships have been experimentally treated, and also to give the results of such

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studies; and, third, to relate psychological studies, principally in the area of verbal learning and behavior, to sentential relationships.

Sentential Bonds

The purpose of this search in the non-experimental literature is to collect devices that have importance in the establishment of coherence and especially those devices that can be said to unite a series of sentences into a coherent whole.

Six speech texts were examined for devices that might relate a series of sentences. Four made no mention of such relationships. 4 Jeffrey and Peterson mention "signposts" as useful tools for binding one sentence to another. 5 One of the most obvious of these devices is the use of numerals. Bryant and Wallace state that in general the principles of "contiguity," "similarity," and "order" are the principles of coherence. 6 This is to say


that similar items or sentences are placed together in an order that a listener or reader knows or has learned to be related. Wilson and Arnold feel that sentences are mentally related by the listener by having learned that certain relationships go together. For instance, most readers know or should know that certain sentences bear a generic-specific relationship to each other. This is to say that one sentence, perhaps a topic sentence, is a general statement, while the following sentence in the paragraph is a specific example or development of it. Because the reader knows of these relationships, he knows that the sentences are related. The texts examined provide general principles of organization, but provide little information as to the specific devices that relate one sentence to another.

When we move to English textbooks or handbooks, authors tend to be far more explicit than the speech texts examined. Gorrell and Laird state that "continuity" and "coherence" are obtained by such words or transitions as "and," "on the other hand," by repetition of words and phrases, repetition of sentence patterns, and parallel construction. Lord is even more specific. He calls

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sentence relationships "the logic of the writer's thought," and gives three devices that accomplish this purpose. These are repetition of key words, such substitution for key words as synonyms and pronouns and use of function words. These function words are such words as "in addition to," "but," "and," etc. Scott and Denney identify similar devices. They cite inversion, which is the process of stating sentences so that key words are placed in position of importance, they do not define key words, parallel construction, repetition of key words, and subordination by sentence coordinates which is similar to parallel construction.

Becker, in an article titled, "A Tagmemic Approach to Paragraph Analysis," presents a relatively new view of the paragraph, and consequently, of sentential relationships. This concept is the tagmeme. The tagmeme is "... a process of partitioning patterns ... which can be defined as the class of grammatical forms that function in a particular grammatical relationship." Becker extends

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this concept to the paragraph and theorizes that paragraphs also have "slots" that can be filled with certain kinds of sentences that bear a certain relationship to each other. Thus, an expository paragraph might consist of a topic sentence, "a T slot," followed by sentences that restrict the topic sentence, "an R slot," and still others that illustrate it, "an I slot." The reader presumably knows of such relations and thus relates one sentence to another by mental activity. Becker further notes that other devices are needed to relate sentences in connected discourse. He states that sentences are related by means of "redundant combinations of graphic, lexical, grammatical, and phonological signals." The graphic signals are indentation and physical separation. Thus the paragraph in printing and writing is marked by some type of indentation and a separation from other paragraphs. Lexical signals are such verbal transitions as "but," "on the other hand," equivalent classes, and parallel structure. Equivalence is basically areas of commonality between any two sentences. Grammatical devices are such words as pronouns with antecedents in the preceding sentences. Phonological devices operate, of course, only in spoken discourse and are such devices as phrasing, inflection, etc. 

12Ibid., 240.
13Ibid.
14Ibid.
Christensen states that a paragraph may be defined as a sequence of structurally related sentences. The main devices that he gives are coordination and subordination. By the term, parallel coordination, he means parallel structure. By subordination, he means analysis or specific illustrations of a general principle.15

Koen et al lists three devices that make a paragraph a paragraph and that relate one sentence to another. These he calls lexical, grammatical, and rhetorical systems. The lexical system he states is derived from equivalence. Equivalence is maintained by such things as synonyms, metaphors, paraphrasing, and relative and personal pronouns.16

Whorf uses the term, "intersentential linkage," to describe those devices that establish sentence relationship. He also calls them "external syntax." He cites such devices as juxtaposition of sentences, such coordinating elements as intonations, suffixes, particles, order of sentences, prosodic means, and sublexical marking.17


Jacobson calls the devices that link a series of sentences together "links" and states that such links are based on the presence of such words as "merely," "however."\textsuperscript{18} Jacobsons' work is particularly interesting. His field is computers and his goal is to program a computer so that it will compose abstracts of scientific articles. He theorizes that sentences are in links and that a topic sentence or main idea is at the beginning or end of a series of links. The topic idea is marked by a lack of words that indicates it proceeds from or is linked to other sentences. He states that he has done a pilot study and that a computer program based on such links was partially successful in "writing" an abstract of a scientific article.\textsuperscript{19}

Harris was the originator of a new method of discourse analysis which relies on the establishment of equivalence between the various parts of discourse. His method is an extension of a technique that has long been used by linguistics in analysis of sentences. This method involves the establishment of a chain of phrases in any example of connected discourse. For instance, if we have two sentences: "Millions can't be wrong. Four out of five people


\textsuperscript{19}\textit{Ibid.}, pp. 284-295.
in a nation-wide survey can't be wrong." The word, "millions," in the first sentence and the phrase, "four out of five people in a nation-wide survey," are equivalent because the rest of the sentence is identical, that is, "... can't be wrong."^20

Like most linguistics, Harris makes no attempt to say how his analysis relates to comprehension, retention, or coherence. He merely states that it is an analysis that might be useful.

Deese theorizes that sentences are united by associative bonds that the reader or listener has learned in the past. It is well known that the human brain through learning has attained clusters of words that are associated with each other. If a group of subjects reliably associate one word with another, then it is said that the two words for the two groups of subjects have high associative strength. Deese proposes that these learned verbal bonds unite a series of sentences together for the reader or listener. He suggests that if words of an example of connected discourse have high associative strength, the material will be easy to read and comprehend.^21

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Fries gives the following devices that link a series of sentences together: the definite article and demonstrative pronoun when used as signal devices; free combinations with "else"; some adverbs such as "later"; such sentence connectives as "then," "afterwards," "hereafter," "therefore" and "after," and such conjunctives as "however," "yet," "nevertheless," etc.  

Menzel, the most recent of linguistic theorists, proposes two types of sentential relationships. The first of these he calls "anaphora." Basically, anaphoric expressions are two sentences which are related by reason of one of them having an antecedent in the sentence preceding it. He gives the following example: "Here comes John. He is my friend." The second sentence is related to the first by reason of the pronoun in the second sentence referring to its antecedent in the first. Menzel lists many types of anaphora. Some of them are given such names as "synonymous," "arithmetic," "inclusive," and "derivational anaphora."  

The second type of relationships, Menzel calls "intersentence syntax." Some of the types that he lists  

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are "conjunctive" indicated by such words as "and" and "but"; time indicated by such words as "same," "after," and "before"; and "causal" indicated by the nature or meaning of the materials."24

El-Okby presents a descriptive study of linguistic and phonological devices that operate as organization or connecting cues. His study was based on the conversation of individuals engaged in discussion with particular emphasis on phonological cues.25

A summary of the various sentential bonds will be given below:
Sentence structure or syntax

Parallel Construction

Inversion: Placement of key words in a more contiguous relationship

Commonality

Repetition of a word or phrase from a preceding sentence

Pronouns with antecedents in a preceding sentence

Synonyms: one word in a following sentence that means the same thing in context

24 Ibid., pp. 150-153.

Antonyms: words showing contrast that are placed in contiguous sentences

Equivalence: Basically repetition from sentence to sentence

Paragraph structure or order:

Contiguity: sentences placed together
Tagmemes: or order slots or places in a paragraph where the reader or listener expects certain classes or order of ideas

Word Association: established or learned word associations

Sentence Connectives

Adverbs that relate to other sentences

In summary, it seems possible to say that a considerable number of theorists from the fields of English, Linguistics, and Psychology recognize the existence of intersentential bonds, that there are many types of devices that operate in connected discourse. Their importance in understanding and retention of material is still to be determined.

Experimental Studies

There are not many experimental studies of sentential bonds. Only three studies treat them, and two of these study sentential bonds indirectly. But intersentential bonds can be considered an aspect of organization or
organizational structure and, therefore, experimental studies that deal with organization will be reviewed in this section.

Organization is not one thing but many things acting together. As Knower notes in his study on organization, organizational skill is skill in many things, only one of which is the relationship of sentences. Thus, experimental studies in organization study different aspects of organization. For instance, one study may be studying main ideas, or another, transitions. In fact, organization has been studied by the presence or absence of main ideas, summaries, transitions, displacement of paragraphs, and displacement of sentences. Obviously, each of these is studying a different aspect of organization. The following studies will be reviewed with these aspects of organization in mind.

Beighley displaced paragraphs in his two studies of organization and found no significant difference in the amount of material learned. Ehrensberger rotated


groups of sentences and found that subjects consistently retained more from those sentences in the final position than they did in the middle and beginning positions. Gulley and Berlo manipulated the paragraph and found no significant difference in retention. Sponberg, however, varied the order of the paragraphs according to their supposed importance and found that the anti-climax order effected significantly the retention of the material of the speech. Thus, the evidence does not clearly substantiate the conclusion that the order of paragraphs is not important in the learning of material.

Parker did find significant results when such things as topic sentences, introductory material, and concluding summaries were removed from a written message. Brown varied the "anticipatory" set or listening set. This set was arbitrarily defined as an introduction


which described how the message was to be organized. He found significant differences between those subjects who had the proper set as opposed to those who did not. This study tends to reenforce the findings of Parker in that variables of organization were similar.

Two studies have used displacement of the sentence to study organization or structure. Because they are similar to the techniques used in this study and because this study is in direct line with them, they will be given more attention.

Darnell, in a study titled, "The Relation Between Sentence Order and Comprehension," varied order by displacing sentences to obtain experimental conditions. His description of the process is cited below:

More than a trillion combinations of fifteen units is possible. A systematic approach resulted in the construction of seven treatments varying in a degree of disorganization. In treatment 2, the thesis sentence was moved to the center, which is the maximum possible distance from both a deductive order and an inductive order. In treatment 3, the two contentions were placed in the middle of the respective halves. In treatment 4, the two contentions were interchanged. In treatment 5, 6, 7, the thesis and contentions were kept in place, and the four subcontentions were moved so that three progressively greater degree of disorder occurred.

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All of the treatments resulted in a significant loss of comprehension as measured by cloze procedure. It is obvious that Darnell is studying several factors in the derivation of the treatments. Some of these are placement of a main idea within the paragraph, placement of thesis sentence, and placement of sentences supporting the main ideas. The most significant point, however, is that sentence displacement resulted in a loss of comprehension.

Thompson, in a similar study titled: "An Experimental Investigation of the Relative Effectiveness of Organization Structure in Oral Communication," did somewhat the same thing except that the subjects heard a speech instead of reading it. His treatment of the variables was as follows:

In order to achieve variation of the structure, each sentence of Communication I was arbitrarily treated as a unit. A second communication was prepared by randomly re-arranging the units (sentences) of Communication I within each of the eight main points presented in the communication. Thus, while the original order of the main points was preserved, point one preceded point two, etc., the arrangement of the units within each main point was a matter of chance. A third communication was prepared randomly re-arranging the units of Communication I within each of the three divisions of the communication: introduction, body, and conclusion.35

A multiple choice test was used to measure comprehension, and there was a significant difference between the original text and the experimental versions.

There are two studies that are rather unusual in their approach to organizational structure. Kotona grouped principles of particular topics in one section and specifics of these principles in a second section and varied the order of their presentation. He found that subjects who read the material responded best when principles were stated first and specifics last.36 Rosenberg used words of varying associative strength and the independent variables. He found that subjects retained more when words of high associative strength were used.37

It seems possible from this review of the experimental literature to say with some confidence that displacement of paragraphs does not cause a loss of learning, while displacement of sentences, absence of introductory material or set, position of topic sentences, and absence of concluding summaries does cause a loss of retention.

Verbal Learning

Little has been done in the area of connected discourse by psychologists. Hall writes as recently as 1971: "Psychologists have done relatively little toward establishing a model for, or discovering those processes involved in the learning of contextual material or connected discourse."\(^{38}\) Perhaps, this reflects the psychologist's desire for precise control that he achieves with individual words or nonsense syllables. This does not change the fact, however, that little has been done in this area.

However, there is a very large amount of material in the area of verbal learning and behavior. Most of it, of course, is with lists of words or nonsense syllables. This material may be of importance in that it suggests parameters or variables in connected discourse. Some of the principles together with their suggested relationship to connected discourse will be reviewed below. It is important to bear in mind that the following studies are based on lists of nonsense syllables or words.

Organized lists are better learned than are unorganized lists.\(^{39}\) This is well proven fact in the area


of verbal learning and behavior. It also reflects the practice of writers and speakers and underlies the research in organization. Recall of categorized word lists is better if all of the items from the same category are presented in blocks than when the presentation sequence is completely random. This is similar to the paragraph, which is basically a block of a series of sentences.

The need to organize is so essential to recall that subjects will impose an organizational model on nonsense material or word lists. Kintsch writes: "The organization of memory is basically subjective. Even in the absence of an objective structure subjects impose their own organization upon the learning material. In fact, subjective organization appears to be a necessary and sufficient condition for the recall of a word list." Furthermore, it has been found that in free association, there is a clustering of responses which further reinforces that subjects impose an organizational pattern on verbal material.

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Recall is better when cues are present to help set an organizational pattern. Reynolds writes: "The data clearly indicates that prior exposure to an integrated and potentially meaningful perceptual structure may provide positive transfer from meaningful verbal structure to more complex tasks such as problem solving and the learning of conceptual material." This supports those experiments that find giving a set or overview for a message increases its comprehension.

Redundancy is a definite help in recall. Miller presented nonsense syllables to subjects in which the amount of redundancy between any two items or syllables was varied. He found that recall was facilitated by such repetition. Miller also reports that subjects who studied the lists without redundancy compared their effort to "cramming," while those who received lists with redundancy compared it to studying. Kintsch confirms this finding. Kintsch calls this redundancy "associative relationships." It does not take much imagination to see the similarity


45Kintsch, Learning, Memory, and Conceptual Processes, p. 292.
between such relationships and connected discourse. For instance, one finds such repetition between almost all sentences that occur in conversation and especially in writing.

Vividness of material is also of importance in recall. Those items which are in some way different from other items are recalled much easier than if all of the items are the same.\(^4\) It seems possible that the aspect of style that calls for variation of words and sentence style is adherence to this need for vividness and for the detection of main ideas.

In conclusion, we can say that theorists recognize the existence of many types of sentential bonds as contributing factors in connected discourse; that two studies may have indirectly studied them and these studies were statistically significant in the amount of material learned by their subjects, and, last, that experiments in the area of Verbal Learning and Behavior indirectly relate commonality and blocking to retention of verbal material.

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\(^4\) Hall, *Verbal Learning and Retention*, p. 68.
CHAPTER III

ORGANIZATION AND SENTENTIAL BONDS

The purpose of this chapter is to refine the notion of organization based on the review of literature, to show the relationship of sentential bonds to structure, and to generate a series of hypotheses that will be tested.

Levels of Structure

As one reads the literature on organization or structure, one becomes aware that connected discourse is organized or structured at various levels. It would seem important to discriminate between the various levels, for it is quite possible that two studies may seem to be about the same thing when they may actually be about something that is different.

This discrimination of levels of organization is recognized in an experimental study by Gulley and Berlo: "Effect of Intercellular and Intracellular Speech Structure on Attitude Change and Learning," the "intercellular structure" is the structure or organization of the main ideas;
the "intracellular" structure of the paragraph.¹ It can again be seen by contrasting two experimental studies. Darnell used the sentence as the unit of displacement and found significant results.² Beighley used the paragraph as the basis for displacement in obtaining experimental variables and did not find significant results.³ Thus, in one sense of the word, it can be said that different levels of discourse were studied.

While it may be said that if connected discourse is extended long enough, there would be an indefinite number of levels, these may be reduced to three. These are organization of the main ideas around a central idea; organization or structure of the paragraph; and organization or structure of the sentence which is better known as syntax. Menzel calls these three levels "interparagraph syntax," "intersentence syntax," and "syntax."⁴

The organization of main ideas around a central topic and according to a preselected plan is the typical


²Darnell, "The Relationship Between Sentence Order and Comprehension," p. 98.


organization that authors of speech texts write about.
Thus, they tell the student that if he is speaking about
a topic which occurs over a period of time, he might use a
chronological plan and unite or group his various points
around that plan.

The second level of organization or structure lies
within the paragraph. It is this second level with which
this study is concerned. Basically, it is a structure or
relation of one sentence to another. The third level is
sentence structure and this level is the familiar syntax.
This is, of course, the arrangement of words within the
sentence and is outside the scope of this study.

Now, we are at the point where we should ask a
fundamental question: What is this structure within the
paragraph and what are the devices, linguistic, or other­
wise, that cause the sentences to seem related?

Sentential Bonds and Structure
If sentences are related into a structured event
known as connected discourse, then there must be something
that relates such sentences. A review of the literature in
Chapter II has provided an extensive number of potential,
phonological, syntactical, and lexical devices that might
bond a series of sentences together.

Not all of the devices that have been suggested in
the review of the literature will be studied; those that
will are commonality which is repetition of content words or phrases, sentence connectives, tagmemes, phonological or vocal devices, and, certain typographical features such as indentation.

Before an explanation of each of these types is given, it would be helpful to give an example of such bonds and how they operate in a sample of connected discourse. This example is taken from Weaver and Ness. The sentences are numbered and these numbers will be used to refer to the sentences in the following discussion. The words that are sentential bonds will be named in brackets between the sentences.

1. The first and basic element of the vocal tone is **quality**.
   
   [Repetition of a word]

2. **Quality** is determined by the particular combination of **vibrations** which compose it.
   
   [Repetition of word with change of form]

3. Most **vibrators** move in complex ways; they oscillate as **units** and as parts at the same time.
   
   [Synonym] [Repetition of word with change of form]

4. For instance, a violin string **vibrates** over its entire length, and, simultaneously, in **segments** that are fixed fractions of the whole—halfs, thirds, fourths, fifths, etc.
   
   [Synonyms] [Repetition of word]
5. The whole string moves more slowly than does its parts; this slower total movement produces what is called the fundamental.

[Synonym]

6. The segments give off more rapid vibrations, which are called overtones, or upper partials.

[Repetition of a word]

7. The overtones fuse with the fundamental.

[Repetition of a word]

8. Other things being equal, the greater the number of overtones, the more pleasing the quality will be.

Commonality

Probably the most common type of sentential bond is repetition of a content word or phrase. In the above paragraph it can be seen that this type is used most frequently and in other material the author has examined, this seems to be the case. Sentences 1 and 2 are good examples of this type of bonding.

It is assumed that pronouns with antecedents in the preceding sentence function in the same manner as repetition. As is well known, the use of the pronoun when its use is clear is recommended instead of repetition. It would seem that if repetition of a word can help unite two

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6 Evidence of this will be presented later in this chapter.
sentences, then the use of the pronoun would function in the same way. It will also be assumed that words having the same stem relate two sentences to each other. Thus, "vibrations" in sentence 2 and "vibrators" in sentence 3 might serve this function.

There are certain words that generally bear a relationship to each other. Synonyms and antonyms are examples of this type of relationship. A synonym is a word that means the same thing or that can be substituted for another in a particular example of connected discourse. There is a distinction that should be noted. There are words that in general are synonyms; they are so listed in the dictionary. There are other words that are only synonymous in a particular context. For instance, a particular writer in writing of the President of the United States may freely exchange the name of "Nixon" for the "President." At this time and in the context of the written material, "Nixon" and the "President" are synonymous. Obviously, this will not always be true. It should be noted in our example in sentences 5 and 6 that the author uses segments and parts in a synonymous relationship. The test for a synonymous relation is that one word or phrase can replace another without change of meaning.

There are other types of relationships and one of the most important is what we call a generic relationship.
For instance, in sentence 4, "violin string" is an example of a class of objects known as "vibrators" the pronominal equivalent of which is in sentence 3. This is an important relationship in that examples make up much of the sentences or ideas in expository prose or in informative speaking.

Once more it is assumed that sentences that share such synonyms, antonyms, and generically related words are bonded by these devices with the condition that the nature is known by the reader or listener. In other words, a reader of the example must know that a violin string is an example of a class of objects known as vibrators. If he does not, it can be assumed that his retention and comprehension of the material will be defective.

Sentence Connectives.

Sentence connectives are words that help relate one sentence to another. In our example, the phrase "for example" in sentence 4 functions in this manner. There are many such words and their use seems to depend very much upon the type of material being examined. Such words as "therefore," seem to be logical in nature. Morris calls them formators.7 They exist and they are commonly thought to unite a series of sentences.

Phonological Devices.

It can be assumed that sentence relationship is shown not only by verbal factors, but also by pauses, stress, and inflectional patterns. Does a speaker, a good one, tend to stress those parts of sentences which relate one sentence to another? It is known that effective delivery results in higher retention than does poor delivery. It certainly seems that at least pausing between paragraphs or the vocal equivalent of the paragraph would help the listener in retaining or learning material.

Tagmemes.

Tagmemes are sets of expectancies that a reader or listener has for verbal material. They are slots so to speak which are filled with certain classes of material. For instance, sentence 4 in the example, functions in this manner. One might say that after the statement of a general principle, the reader or listener expects illustrations of those principles. Katona has provided experimental evidence on this point.

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8R. Ehrensberger, "An Experimental Study of the Effectiveness of Certain Forms of Emphasis in Public Speaking," 110-111.


In order for the reader to expect such classes of material, it is necessary for the reader to recognize such blocks of sentences or what are usually called paragraphs. Of course, a vocal paragraph is somewhat a different thing than a written paragraph. The written paragraph is signaled by visual cues such as indentation and larger physical separation. The signals for the vocal paragraph are less known, but it can be supposed that pausing, vocal emphasis could function in this manner. Obviously, our example does not show such cues as they are spoken.

Thus, in summary, we hypothesize that for the purpose of this study, structure or intersentential relationships are based upon four factors. These are commonality or repetition of content words or phrases between sentences, tagmemes, phonological and typographical cues for blocks of sentences. From these, three principles can be stated from which the hypotheses for this study will be built or derived. These will be presented together with the reasons for believing that they are tenable.

Derivation of Hypotheses

Commonality must be present between most sentences in order for them to be perceived as a unit and such unity is essential for comprehension or retention of material. At present, the only evidence that this is so is of a non-experimental nature. However, two studies of an experimental
nature support this contention. Darnell\textsuperscript{11} and Thompson\textsuperscript{12} displaced sentences from an original message and found retention to be lower for the experimental groups. Although the studies were not designed to test for commonality, it seems possible because of the method used to manipulate the variables that such bonds might be weakened. Furthermore, it is generally agreed by teachers of connected discourse that such commonality is necessary for coherent material. In addition, certain psychologists working in the area of Verbal Learning and Behavior recognize similar patterns as being related to learning.\textsuperscript{13}

Words that are common to any two sentences must be as contiguous as possible. It is generally agreed that a pronoun and its referent in a preceding sentence must be as close as possible to avoid ambiguity. Extending this principle, it might be said that if two words are to be perceived as uniting two sentences, then they must be as close as possible. This means that they must be, if possible, in succeeding or adjacent sentences. Furthermore, it seems possible to hypothesize that a reader or listener

\begin{itemize}
  \item \textsuperscript{11}Darnell, "The Relationship Between Sentence Order and Comprehension," 97.
  \item \textsuperscript{12}Thompson, Ernest, "An Experimental Investigation of the Relative Effectiveness of Organizational Structure in Oral Communication," 69.
  \item \textsuperscript{13}Miller, Free Recall of Redundant String of Letters," 210-213.
\end{itemize}
will remember clearly only the sentence which has just been read or heard and that, therefore, it is only to this sentence that he can properly relate to the succeeding one.

It will be shown later in this chapter that commonality is an extremely common feature of connected discourse and that because of its omnipresence that it must contribute to the learning of material. In other words, if something exists in a system built by humans and language is such a system, then it must have some importance in accomplishing the goal of that system. Thus, commonality must be related to the transfer of information.

Sentences should be differentiated by cues as to their function within the body of the message. Some types of intersentential relationships are determined by their position in the paragraph as well as by functional cues in the sentences themselves. This quality of sentence distinctiveness will be called differentiation. As Becker has stated, certain relationships are understood because of the "slots" within the group or paragraph which the sentences fill.¹⁴ For the reader or listener to know or expect the slots, cues must be given that such a grouping exists and/or that certain slots are being filled.

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Obviously, paragraph indentation is such a cue as is perhaps pausing before each new paragraph.

It is generally considered that main ideas are sentences around which this clustering occurs. Main ideas, however, can be at the middle of the sentence or at the end. The problem is further complicated by the fact that the topic sentence may not have linguistic reality. Menzel suggests that might be the case.15 This is to say that topic sentences may be determined semantically; which is to say, that a reader or listener determines that certain sentences with a certain type of meaning, or with a degree of generality, or by some other semantic consideration, are topic sentences.

There is the possibility, however, that slots within the paragraph are indicated by other methods. Some of these might be the use of words that indicate the slots. Thus, a phrase like "for example" would indicate that such a slot is being filled by a particular type of thought or sentence. In addition, main ideas might be indicated by stylistic differences in the sentences themselves. This quality of written material will be called differentiation.

In the pilot study for this dissertation, students complained that they could not learn material because

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it "was all the same." In truth, they did not
learn anything from the stimuli as measured by a post
test. Therefore, a new message had to be composed. This
suggested in an informal way that differentiation is a
significant factor in learning from connected discourse.

Experiments with word lists indicate that group­
ing is related to recall. Both Kintsch and Cofer offer evidence of this and Hall writes that as a general
principle "distinctiveness" is important in recall. Thus, there is psychological evidence that both grouping
and distinctiveness might be related to recall.

The above principles will be studied in relation
to three methods of measuring learning or difficulty of
material being read. These are retention of information
as measured by a retention test, retention of informa­
tion as measured by recall, and difficulty of a message
as measured by reading time.

The standard way of measuring learning is by an
objective or multiple choice test. Standard procedures for
estimating reliability and validity have made this type of
test one of the most used devices for measuring learning.

16 Kintsch, Learning, Memory, and Conceptual
Processes, p. 266.

17 Cofer, "Clustering in Free Recall as a Function

18 Hall, Verbal Learning and Retention, p. 68.
Thus, it was chosen as the most reliable way of measuring learning. The multiple-choice test used in this study must be regarded as a test of recognition or retention even though there are some of the questions that might measure comprehension.

The recall test used in this study is a word count of the ideas presented in a message by the subjects after hearing the message. This seemed worthy of attention because at least one psychologist feels that recall is something different from recognition. Kintsch writes: "Dual process theory merely maintains that recognition and recall are qualitatively different processes." It was felt, therefore, that a test of recall might show some significant difference, whereas a test of retention would not.

Reading time is not a test of comprehension but a measure of the difficulty of the material being read. It seems possible that it might detect differences in the treatment of the various variables. It was chosen as an objective and reliable way of determining another aspect or impact of the subjects to the message.

Combining the three basic principles with the above tests, the following hypotheses about differences between the variables can be derived:

1. There are significant differences between test scores for recognition, recall, and reading time of messages which are treated for commonality and those which are not.

2. There are significant differences between test scores for recognition, recall, and reading time of messages which are treated for differentiation and those which are not.

3. There are significant differences between test scores for recognition, recall, and reading time of messages which are treated for phonological and typographical cues and those which are not.

These are general hypotheses and they will be further subdivided and tested in the following chapter. Before doing this, however, it seems important to establish to what extent sentential bonds occur in connected discourse.

The Extent of Sentential Bonds

The heart of this study is to test the assumption that sentential bonds are important in the understanding of connected discourse. The message used for this study has been designed to use them consistently. One question not yet answered is to what extent do such devices occur in ordinary discourse. In other words, is it not possible that the present message is an artifact, something that does not exist in reality?
In order for the investigator to answer this question partially, twenty samples were taken from the library in random fashion. One or more books, depending on the size of the section, were selected from each of the main sections of the Library of Congress classification system. Samples of ten sentences each were selected from twenty books. The samples were taken as nearly as possible from page 100. In any sample there are nine pairs of sentences figuring in this manner: 1,2; 2,3; 3,4; etc.

It was found that in 88.8% of the pairs of sentences, there were common content words. What is even more interesting was that in most of the cases where there were no common words between sentences was at the boundary of paragraphs. In other words, the paragraph might be defined as the place where the chain of sentences ends.

This tends to establish that commonality is a characteristic of connected discourse as it is found in formal writing. There is reason to believe that this same feature exists in effective oral discourse as well.

A second analysis of the material was made to find the number of connecting words or phrases. These were defined as such words or phrases as "for example," "consequently," etc. Such words were found between 4.4% of the sentences. This would indicate that such connecting links as words and phrases do not occur regularly in formal written discourse. However, according to some linguists,
adverbs, articles, and other parts of speech can connect or relate sentences to each other, but no reliable method exists for detecting these from the same parts of speech that do not.\textsuperscript{20} For this reason, the above figure is somewhat low.

In summary, it is hypothesized that structure of written discourse is dependent upon sentential bonds, that such bonds are dependent upon such things as repetition of words or phrases or their pronominal equivalent, differentiation between sentences to show relationships to other sentences, and, last, by grouping of sentences into vocal or written groups or paragraphs. In the next chapter, specific hypotheses will be tested for these relationships.

CHAPTER IV

EXPERIMENTAL PROCEDURES

The purpose of the following experiments is, to find if a relationship exists between certain aspects of sentential bonds and retention, recall, and reading time. In order to do this three experiments will be conducted. These three experiments are (1) oral messages with a multiple-choice test of recognition, (2) written messages with a multiple-choice test of recognition and, (3) oral messages with a measure of recall. Because these three experiments share the same message or treatments and use the same tests, these will be considered below.

The Message Treatments

Treatment I--Base Message

The topic of the message was "Speaking Effectively" and its content was a discussion of the methods of vocal production and its relationship to such aspects of speaking as pausing, word stress, etc. The subject was picked because it was the type of material that a student in the fundamental course of speaking might receive in a lecture or read in a speech textbook. In fact, the message was
based on material taken from Weaver and Ness.\(^1\) The author has used much the same material in his basic speech course. It was felt, therefore, that the material should be within the grasp of the freshman speech student.

The message was 87 sentences long. It contained an introduction, conclusion, and two transition paragraphs. The message was constructed so that sentences within it could be displaced in two ways: first, by displacement of individual sentences so that common content words between any two sentences could be reduced, and, second, by another type of displacement so that common content words between any two sentences could be maintained to the same degree as that of the base message.

This concept is important, because it was found early in this study that certain topics would yield a series of sentences, the displacement of which would not reduce the number of words shared by two pairs of sentences. Some series of sentences, for instance, possess the same word in common, and, thus, displacement would not effect commonality. Therefore, both the topic and the way it was developed were especially selected and constructed to permit such treatment. Furthermore, certain words and phrases were added to the sentences. These were such words as "for example,"

"now," etc., words that did not seem to convey much, but which were important in the derivation of Treatment IV.

In a certain sense, a message must have validity, that is, it must teach something. In order to know if the message had this property, the test was administered to students who had not heard the message and compared with those subjects who received the base message. The difference in the means was 5.65, which was significant beyond the .01 level. This showed that the message was capable of teaching the type of subjects who would take the experiment. The message (Treatment I) is given in Appendix B and was used as a base for comparing the other treatments in the following experiments. This base message was modified in various ways to arrive at four different messages, each containing for the most part the same sentences and the same information as the control. The derivation of these messages or treatments will be described below.

Message Treatment--II-A and II-B

The purpose of Treatment II-A (sentences so displaced that commonality was reduced) was to produce a message which contained exactly the same sentences as Treatment I, the base message, but which differed in certain other ways. The method used was to displace the sentences in such a way that commonality, which is the repetition of content words or phrases or its pronominal equivalent,
was reduced. In other words, the number of pairs of sentences which contained shared words was reduced. The purpose of Treatment II-B (sentences so displaced that commonality was maintained) was to displace sentences in such a fashion that the number of shared words was not reduced in comparison to Treatment I. In other words, both messages contained sentences which were displaced but in one case the displacement reduced the number of shared words; in the other case it did not.

The logic behind this was that if sentences are displaced, it can be argued that many things are disturbed other than the commonality that exists between any two sentences. For instance, in Chapter II, a review of the literature showed that there were many sentential devices that exist in any particular paragraph. If this were not the case, a paragraph could be read backwards and it would seem connected because there would be common words between any two sentences. This is, of course, not true as anyone can tell by reading a paragraph backwards. Thus, if there were a significant difference between Treatment II-A and the base message, it could be argued that commonality or shared words were not important in the understanding of the message and consequently of the amount of learning that took place. But, if both treatments, II-A and II-B, contained displaced sentences to the same degree and II-A has a significantly lower mean and II-B does not, it can then
be argued that commonality is one of the factors that causes a series of sentences to seem related.

A mathematical measure of the degree of commonality in the three messages was obtained by counting the number of pairs of sentences containing common content words between them. For the base message, the number of pairs of sentences containing common words was 63; for Treatment II-A, (sentences so displaced that commonality was reduced) the number was 22; for Treatment II-B (sentences so displaced that commonality was retained), the number was 50. The latter figure approaches the number of pairs in Treatment I, while the number of common words for Treatment II-A was much less. This tends to give objective validation for the variable of commonality.

To further reduce the extraneous variables between the three treatments, care was taken that the displacement took place in each of the messages to the same degree. The mean displacement for Treatment II-A (displacement in such a way that commonality was reduced) was 1.10. This, of course, means that the sentences were not displaced on the average more than one place. The mean for Treatment II-B (displacement in such a way that commonality was maintained) was .966. The difference was .13. It was felt
that this was sufficient reason to suppose that the amount of displacement was essentially equal.\(^2\)

The amount of displacement was deliberately kept to a minimum because a larger displacement would test the obvious, and, even more important, would mean destroying the paragraph. Furthermore, if sentences are randomly distributed through the body of material it would be likely that such manipulation would not tell what principle of organization or structure is being violated. Furthermore, if distribution of the sentences were to go much beyond the paragraph, then it could be argued that the grouping of the sentences had been impaired and thus the results were due to this rather than the factor under study. Thus, the sentences were displaced very little in order to test only the relationships of sentences and not such things as the grouping of sentences into paragraphs. The introduction and conclusion were not changed or displaced within themselves or in the body of the message.\(^3\)

Treatment III—Differentiation

Sentences may differ from one another in terms of syntax or structure. Thus, the two sentences, "The boy hit the ball," and "The cat ate the food" are identical in form.

\(^2\)See Appendix F for the actual displacement of the sentences.

\(^3\)See Appendices C and D for Treatments II-A and II-B.
But if the first sentence were passive: "The ball was hit by the boy," the sentences would not be in the same form. Thus, the two sentences would differ in structure.

Certain words function as cues that certain sentences bear a certain relationship to each other. If a writer states a general principle and introduces the next sentence by "for example," he would show the relationship of the latter sentence to be a specific application of the first sentence. It is important to note, however, that the writer does not always show the relationship that sentences bear to each other. This quality by which sentences differ from each other in sentence structure and cues will be called differentiation.

It would seem that such differentiation is important in the learning of verbal material and that well structured material will be relatively high in this particular quality. On the other hand, if each sentence were much like the others, a loss of comprehension might result.

In order to produce this variable, the sentences of Treatment I were rewritten so that they resembled each other in terms of structure to effect a reduction of recognition or learning. Thus, certain phrases as "for example," "now," were eliminated unless their elimination interfered with the meaning. In addition, four sentences were removed altogether. For example, sentence 14: "The
second organ of vocal production is the vocal variables," was removed. These sentences were not essential to the meaning of the message. In fact, they had been deliberately added so that they could be removed for the writing of Treatment III. Approximately half of the sentences were changed. The removal of this material resulted in a message of shorter length. The removal of the words and sentences resulted in a message which was 8 per cent shorter than the original message. 4

Treatment IV—Phonological

Treatment IV was produced by eliminating pauses between paragraphs of Treatment I. This was done by editing the original tape. Thus, the message was identical to Treatment I in terms of inflection, emphasis, and rate. Only the pauses between the paragraphs were changed. Since, there were 19 paragraphs, this resulted in the elimination of 18 pauses. This was a simple change, but it was thought that pauses might be essential for the listener in determining the oral paragraphs, and thus, the grouping of the sentences. This factor, it seems, might have some importance in the retention of verbal material.

The recordings of all the messages were made by a professional radio announcer on professional equipment;

4See Appendix F for a complete description of changes and Appendix E for the actual message.
the recording was full track. The message was played back on a Wolensak tape recorder with external speakers added.

Each treatment was accompanied by a taped introduction stating the reasons and the directions for taking the test. The method used in giving the test was to play the introduction, stop the tape, hand out the pencils, answer sheet and continue with the message.

Written Treatments—I, II-A, II-B, III, IV

The written messages or treatments were identical to the spoken except that certain sentences had to be written in dialogue to match the way those sentences were spoken. The written form of Treatment V was obtained by eliminating the paragraph, that is, by eliminating identification and spacing between the last sentence and the beginning of a new paragraph.

The Tests

Not all of the measuring devices are tests in the complete sense of the word. The tests that were used were of three types. The first type was a multiple-choice type of test, the second was a recall test, and the third was a measure of reading time.

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5See Appendix A for introduction.
The multiple-choice test was of standard form. It contained two sections. The first section had four ques-
tions to test the attitude of the subjects toward the mes-
sage. These questions were, "Was the message organized?"
"Was the message interesting?" "Was the message clear?"
and "I learned from the message."

The second part of the test contained questions to measure recognition. These were multiple-choice items
with four choices and match-columns type of questions. In a strict sense of the word, the multiple-choice test
can be considered to measure recognition, although some of the questions require some understanding of the rela-
tionships of the various parts of information to answer the questions. Thus, in a sense, it can be said to
measure comprehension.

In forming the test, three sets of item analyses were performed. Two item analyses were done before the experiment. The last item analysis was done by eliminating undesirable items after the experiment by excluding items that were too easy or too difficult or did not discriminate. The final results were a set of 41 questions. The level of difficulty ranged from .26 to .91. Eighty-nine per cent were within the range of .30 to .80. The reliability of the test calculated according to the

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6See Appendix G for a copy of the test.
Kuder-Richardson 20 formula was .768. This formula gives a low estimate of reliability and it is probably that the true figure is above this.  

Construct validity was established by testing subjects who had heard the message with those who had not. The difference in the means was 5.65 which was significant beyond the .01 level. Thus, the test was capable of detecting the difference and thus can be said to possess construct validity.

The recall test consisted of asking the subjects upon hearing the message to write down, in outline form, as much as they had remembered. Those responses not in outline form were excluded. Outline form is showing graphically main and subordinate ideas. Those parts of the outline which were obviously not related to the material which they had heard were also eliminated. The score was obtained by counting the words.

This might sound overly simple, but King has researched this technique and found that of the six ways

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7Sylvia L. Ferrari, "Classroom Test Scoring Services" (Kent State University: Examination Aids Center, 1970), p. 25.

in which recall might be calculated, a simple count of the words gave the most valid result.

For the written treatments, the reading time was measured. This was done by having the subjects hold up their hand when they had finished reading and the elapsed time was announced to them. They then wrote this down on the exam sheet. It is estimated that this method was accurate to plus or minus five seconds.

The experimental procedures involve three experiments using the above treatments and tests. These three experiments are (1) oral message treatments with a recognition test, (2) written message treatments with reading time and a recognition test; and (3) oral message treatments with a recall test. These will be reported below.

Experiment I

Oral Message Treatment with a Recognition Test

The hypotheses to be tested in this experiment were:

1. Subjects who hear a message in which the sentences have been displaced but in such a way that commonality is reduced will achieve a significantly lower score than those subjects who receive the base message treatment. (Treatment II-A compared with Treatment I)

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2. Subjects who hear a message in which the sentences have been displaced but in such a way that commonality is not reduced will not achieve a significantly lower score than subjects who hear the base message treatment. (Treatment II-B compared with Treatment I)

3. Subjects who hear a message in which the sentences are not differentiated will achieve a lower score than those subjects who hear the base message treatment. (Treatment III compared with Treatment I)

4. Subjects who hear a message in which the paragraphs are not phonologically distinct will receive a significantly lower score than those subjects who hear the base message treatment. (Treatment IV compared with Treatment I)

The subjects for the experiment were students enrolled at the Ohio State University in the fundamental speech course, Speech 105. Ten sections were used for the experiment and the total number of subjects used was 197. Treatments were randomly assigned to class sections. The entire experiment was carried out in one day, April 5, 1972.

Since there were two sections of Speech 105 for each hour, two administrators were used to give the experiment. One was the author, the other, a graduate student. Neither person was known to the subjects. Having two administrators introduces another variable into the experimental procedure. However, the scores of the two classes were averaged, thus reducing this factor.
The results of Experiment I are presented in Table 1. The level of significance for the acceptance of the hypotheses was set at .05, two-tailed test. A test for homogeneity of variance was conducted and it was not significant for any of the groups. Thus, the variances can be considered as equal. For this reason, a t test was used for detecting significant differences between the means.

**TABLE 1**

Means and Differences of Recognition Scores Between Base Treatment Group and Other Treatment Groups—Oral Message

<table>
<thead>
<tr>
<th>Treatment</th>
<th>I</th>
<th>II-A</th>
<th>II-B</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Subjects</td>
<td>46</td>
<td>34</td>
<td>41</td>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>Mean</td>
<td>23.07</td>
<td>21.03</td>
<td>21.73</td>
<td>20.89</td>
<td>22.07</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>5.19</td>
<td>5.27</td>
<td>4.82</td>
<td>5.72</td>
<td>5.28</td>
</tr>
<tr>
<td>Differences</td>
<td>2.04</td>
<td>1.34</td>
<td>2.18</td>
<td>.992</td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>1.699&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.221</td>
<td>1.767&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.871</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Base Treatment; II-A—Low Commonality; II-B—High Commonality; III—Differentiation; IV—Phonological Treatment.

<sup>b</sup> All differences and t's are between Base Message Treatment I and the other treatments.

Results

None of the hypotheses can be accepted at the .05 level of confidence. Thus, a commonality, differentiation,
and pausing between paragraphs are not shown to be a factor in learning of verbal material under the conditions of this experiment.

Four questions were asked at the beginning of the test to see how the subjects felt about the messages. These four questions about the message centered around the interestingness, its clarity, and whether or not the subjects felt that they learned anything about the message. Strangely enough, the subjects felt in all four of these areas that Treatment II-B (displacement so that commonality was maintained) was more organized, more interesting, more clear, and that they learned more from it than they did from the control stimulus. The differences were not significant. Subjects felt that the Treatment III (differentiation) was more organized and this difference was significant. Subjects felt that Treatment IV was less well organized, less interesting, and that they learned less from this stimulus than they did from Treatment I, the base treatment. Subjects felt that Treatment II-A (sentences so displaced that commonality was reduced) was less interesting than the base treatment. They did not find, however, this treatment to be less organized than the base treatment. This seems to say that either they do not recognize that commonality exists or that they do not perceive it to be a part of their concept of
organization. Other differences between the control and the other treatments were not significant.

Experiment II

Written Message Treatments With Reading Time and a Recognition Test

The second experiment was very similar to the first except that it was written instead of being spoken. The phonological treatment, of course, could not be presented in writing and so Treatment IV was presented without the paragraphs being indented or other spacing between sentences being used. Thus, the subjects read a series of sentences without paragraphs. Thus, Treatment IV is a typographical variable.

In testing, the same test of recognition, a multiple-choice test was used. In addition, the reading time of each student was measured. This was done by asking the student to raise his hand when he was finished and the elapsed time was given to him. This was considered the most accurate method, and it was accurate to plus or minus five seconds.

The subjects were Kent State Students and the experiment was conducted within a three-day period. Each treatment was randomly assigned to each student. This was done by preordering the five written treatments and passing them out in sequence. This meant that in any class period that there were approximately the same number of subjects taking each of the treatments. Furthermore, this controlled
the variable of difference between the various classes of
time of day and of different instructors since all message
treatments were given in the same hour.

The hypotheses to be studied were:
1. Subjects who read a message in which the sentences
have been displaced in such a way that commonality is
reduced will receive significantly lower scores than will
those subjects who read the base message treatment.
(Treatment II-A compared with Treatment I)
2. Subjects who read a message in which the sentences
have been displaced but in such a way that commonality is
not reduced will not receive a significantly lower score
than those subjects who read the base message treatment.
(Treatment II-B compared with Treatment I)
3. Subjects who read a message in which differentiation
is decreased will receive a significantly lower score than
subjects who read the base message treatment. (Treatment
III compared with Treatment I)
4. Subjects who read a message in which the paragraph
is not typographically distinct will receive a signifi­
cantly lower score than those subjects who read the base
message treatment. (Treatment V compared with Treatment I)

The level of significance for the acceptance of
the hypotheses was set at .05. A test for homogeneity of
variance was conducted and it was not significant for any
of the groups. Thus, the variances can be considered as equal. For this reason, a t test was used for detecting significant differences between the means. The scores, means, difference between the means, and t's are given in Table 2.

**TABLE 2**

Means and Differences of Recognition Scores Between Base Treatment Group and Other Treatment Groups--Written Message

<table>
<thead>
<tr>
<th>Treatment</th>
<th>I</th>
<th>II-A</th>
<th>II-B</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Subjects</td>
<td>25</td>
<td>21</td>
<td>24</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Mean</td>
<td>20.44</td>
<td>22.24</td>
<td>20.54</td>
<td>22.65</td>
<td>22.09</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>5.82</td>
<td>5.62</td>
<td>4.95</td>
<td>4.95</td>
<td>4.54</td>
</tr>
<tr>
<td>Difference</td>
<td>1.80</td>
<td>.102</td>
<td>2.21</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>1.037</td>
<td>.065</td>
<td>1.383</td>
<td>1.065</td>
<td></td>
</tr>
</tbody>
</table>

*a*--Base Treatment; *II-A*--Low Commonality; *II-B*--High Commonality; *III*--Differentiation; *IV*--Typographical Treatment.

*b*All differences and t's are between Base Message Treatment I and the other treatments.

None of the differences are significant and thus, none of the hypotheses can be accepted. What is surprising, however, is that the means, even though they are insignificant, are in the reverse order than was expected.
It is conceivable, perhaps, that the students in reading try harder when the message is more difficult.

In addition to the retention scores, the reading time was calculated. The hypotheses are given below.

1. Subjects who read a message in which the sentences have been displaced in such a way that commonality is reduced will take longer to read the message than those who read the base message treatment. (Treatment II-A compared with Treatment I)

2. Subjects who read a message in which the sentences have been displaced but in such a way that commonality is not reduced will not take longer to read the message than those subjects who read the base message treatment. (Treatment II-B compared with Treatment I)

3. Subjects who read a message in which differentiation is decreased or the similarity of one sentence to another is increased will take longer to read a message than those subjects who read the base message treatment. (Treatment III compared with Treatment I)

4. Subjects who read a message in which the paragraph is not typographically distinct will take longer to read the message than those subjects who read the base message treatment. (Treatment IV compared with Treatment I)

The scores, means, difference between the means, and t's are given in Table 3.
TABLE 3

Means and Differences of Reading Time between Base Treatment Group and Other Treatment Groups—Written Message

<table>
<thead>
<tr>
<th>Treatment</th>
<th>I</th>
<th>II-A</th>
<th>II-B</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Subjects</td>
<td>25</td>
<td>21</td>
<td>24</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Mean</td>
<td>6.56</td>
<td>7.02</td>
<td>6.59</td>
<td>6.29</td>
<td>6.31</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.40</td>
<td>1.12</td>
<td>1.41</td>
<td>1.13</td>
<td>1.34</td>
</tr>
<tr>
<td>Difference</td>
<td>.46</td>
<td>.03</td>
<td>.03</td>
<td>.27</td>
<td>.25</td>
</tr>
<tr>
<td>t</td>
<td>1.202</td>
<td>.081</td>
<td>.702</td>
<td>.619</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)I—Base Treatment; II-A—Low Commonality; II-B—High Commonality; III—Differentiation; IV—Typographical Treatment.

\(^b\)All differences and t's are between Base Message Treatment I and the other treatments.

The level of significance for the acceptance of the hypotheses were set as .05. A test for homogeneity of variance was conducted and it was not significant for any of the groups. Thus, the variances can be considered as equal. For this reason, a t test was used for detecting significant differences between the means.

None of the results in the reading time were significant. This does not bear out the hypotheses that subjects who receive more difficult material because of disorganization would spend more effort at it. At least, it
does not bear out the hypothesis that they would spend more time at it.

Experiment III

Oral Message Treatments with a Recall Test

The third and last experiment was concerned with recall. Kintsch, among other psychologists, has proposed that recall is a different thing from recognition or retention. It was, therefore, felt that it might serve some useful purpose to have some indication of recall, to see if recall differs from recognition.

The subjects that were used were students of Akron State University. Treatments were assigned randomly to five different classes. The experiment was conducted within a three day period at the beginning of the Spring Quarter.

The message, introduction, and method of giving the experiment were identical with Experiment I except that the students were asked to provide an outline of the material that they had just heard. The score given was a word count, that is, the total number of words in the outline. The hypotheses were also identical with those in experiment.

The results are given in Table 4.

TABLE 4
Means and Differences of Recall Scores Between Base Treatment Group and Other Treatment Groups—Oral Message

<table>
<thead>
<tr>
<th>Treatment</th>
<th>I</th>
<th>II-A</th>
<th>II-B</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Subjects</td>
<td>21</td>
<td>12</td>
<td>20</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Mean</td>
<td>85.86</td>
<td>71.83</td>
<td>90.65</td>
<td>77.83</td>
<td>81.58</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>46.82</td>
<td>50.23</td>
<td>45.17</td>
<td>87.90</td>
<td>33.73</td>
</tr>
<tr>
<td>Differenceb</td>
<td>14.03</td>
<td>4.79</td>
<td>8.03</td>
<td>4.28</td>
<td></td>
</tr>
<tr>
<td>tb</td>
<td>.780</td>
<td>.320</td>
<td>.683</td>
<td>.308</td>
<td></td>
</tr>
</tbody>
</table>

aI—Base Treatment; II-A—Low Commonality; II-B—High Commonality; III—Differentiation; IV—Phonological Treatment.

bAll differences and t's are between Base Message Treatment I and the other treatments.

The level of significance for the acceptance of the hypotheses was set at .05. A test for homogeneity of variance was conducted and it was not significant for any of the groups except Treatment III. Thus, the variances were equal for all groups except this group. A t test was, nonetheless, used for detecting significant differences between the means.

None of the t's were significant, but it is worthwhile noting that the mean differences are all in the predicted direction. In fact, Treatment II-B for which no difference was expected actually had a higher score than
did the original message. Thus, although this comparison was not significant, it parallels the means of Experiment I.

The results of the three experiments do not indicate that learning as tested by tests of recognition, recall, and reading time are significantly related to the structure of the message used when defined in terms of commonality, differentiation, and grouping of sentences by typographical and phonological means. There is some indication that some of the results might be significant in that the means for commonality, differentiation, were in the predicted direction for Experiment I and Experiment II. This suggests that further attempts to measure the impact of sentential bonds might be worth another attempt. This will be discussed in the following chapter.
CHAPTER V

CONCLUSION

The results do not indicate that structure as it has been defined in this study, that is, commonality and differentiation, is significant in the recognition or retention of verbal material in an oral message. The finding is, of course, restricted to the population from which the sample was drawn, that is, college students and for the message tested.

The results do not indicate that structure as it has been defined in this study is significant in the recognition or retention of verbal material in a written message. A possible explanation for this is that structure has been defined as commonality between any two sentences. It was hypothesized that displacement of these sentences would result in a loss of commonality and, consequently, a loss of retention for those subjects who receive such a message. The sentences, however, were displaced very little, on the average of 1.000 for the entire message. It seems possible, therefore, that the reader might have been able to reread the sentences and to find how the sentences relate to each other. Of course, in listening, this would not be possible;
the listener must attend to each sentence as it is being vocalized and cannot go back and relisten to the previous sentences so that the relationship of sentence to sentence is not clear.

However, if this were true, it would seem that the reading time for the messages which had been altered would increase. While the average time of the messages did increase, it did not increase significantly. In fact, for Treatment III, differentiation, the reading time decreases.

The above results were obtained from a test of recognition. Because recognition is only one method of detecting learning, there was reason to believe that there might be differences between variables using recall as a method of detecting learning. Kintsch has indicated that recognition and recall were two different processes, and that, therefore, different results might occur from the two methods of measuring learning. The differences were not, however, significant. The results were in the desired direction and it seems, therefore, that use of recall measured as a simple word count might be a valuable tool for detecting differences in connected discourse.

Although the results for this study did not show significance, both measures of learning, recognition and

1Kintsch, Learning, Memory, and Conceptual Processes, p. 282.
recall, for the message treatment of commonality for an oral message were in the expected direction. This gives some promise that if the amount of learning for a message could be increased or the displacement of the sentences could be increased without violating the paragraph that commonality might be tested with more positive results.

The question is often asked that if the differences are so small in studies of organization, why is structure worth studying? In fact, many experiments studying the learning of verbal material from a relatively long message indicate that learning is minimal. Tuinman, for instance, found the mean difference between students taking the Reading Comprehension Test and those who did not was 2.34.²

Of course, if students gain two points of knowledge for each ten minutes of lecture that they hear, they will gain ten points of knowledge in the course of a lecture hour, and, of course, the gain in the course of a series of lecture over a quarter can theoretically be quite large. Thus, messages which are not well designed might cause much confusion when a small error is repeated over a long period of time.

There is also the possibility that in giving students or subjects a recall or test of recognition is not

really asking the right question. Does the student upon hearing a lecture full of facts really expect to retain many of them? Perhaps, the only expectation that he has is a clear set of notes from which he can study. Perhaps, the best test of the quality of a message would be in some way to evaluate his notes and see if the student recognizes main ideas and the relationship of the supporting material. Unfortunately, there is no real good way of examining the notes and objectively assigning a score to them.

The author once upon reading an issue of *Time* went to his office to see how much of it he could recall. Thinking of a particular article, he found that he could recall the principal idea, and, perhaps, one or two supporting facts and these in a most general way. In other words, the human brain either rejects much of the material that it hears or reads, or the present way of testing for such information is inadequate.

There is another explanation for the small differences in the retention scores. Subjects who hear a message are being tested on short term memory. Now, short term memory has been investigated for some time and it is known that as the amount of material to be learned increases, the more difficult the task is. The short term memory has a limited capacity. Perhaps, the subjects can only retain

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3Hovland, "Human Learning and Retention," p. 620.
so much and, thus, most of the message is lost. Perhaps, there is interference in the information to be learned.

The author noted in the giving of the experiment, students would listen well for the first three or four minutes of the message. Then it seems an adverse effect would take place. Some seemed to simply give up. This could indicate that messages of shorter duration might be more effectively studied. The problem in doing this is the test. In order to have a reliable test, the test must be of substantial length. In order to test over thirty items, a ten minute message is needed. However, some preliminary work has been done by assigning students small bits of reading matter and giving one multiple-choice question. This might be a better experimental procedure, but it does not permit the giving of a formal speech as a stimulus. It might even be a satisfactory solution for the low level of learning from longer messages.

Implications for Further Research

Supposing that structure as it is defined in this study is significant, that it is related to the learning from connected discourse, what does it mean? Does it have potentialities beyond that of organizational structure? Does it have possibilities for further research of even greater significance?

^Bormuth, "Children's Comprehension of Between and Within Sentence Syntactic Structures," p. 105.
In order to consider this possibility, consider the matter of structure. If the structure of a paragraph is determined by sentential bonds, then it seems possible that different types of structure might result. Not all paragraphs or examples of connected discourse are equally complicated or use the same type of sentential bonds or use them in the same way. Our example on page 33 of this study was chosen for the number and variety of sentential bonds and especially for the fact that the words that are used vary from sentence to sentence. If the common words are taken out from the sentences and displayed sentence by sentence, the following pattern emerges.

<table>
<thead>
<tr>
<th>Sentence</th>
<th>Common words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality</td>
</tr>
<tr>
<td>2</td>
<td>Quality</td>
</tr>
<tr>
<td>3</td>
<td>Vibrators</td>
</tr>
<tr>
<td>4</td>
<td>Vibrates</td>
</tr>
</tbody>
</table>

It is worthwhile noting that each pair of sentences, the common word changes. It was this type of pattern that was needed in this study to produce a displacement effect for the treatment of the variables.

This by itself may not seem to be important, but consider another kind of structure in the following example:

1. Gesture consists of visible signs made with the hands, arms, head, face, and eyes.
2. Awkward gestures call attention to themselves.
3. They lose their symbolic character in the general feeling of strain and even shock that they produce emphatically.

4. Gestures should be graceful, not to evoke the comment that they are graceful, but because when they are not so, they draw attention to themselves.

5. Gestures must see a part of total bodily action.5

If the common words are taken out and displayed in the following manner, the following structure emerges:

<table>
<thead>
<tr>
<th>Sentence</th>
<th>Common word</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gesture</td>
</tr>
<tr>
<td>2</td>
<td>Gestures</td>
</tr>
<tr>
<td>3</td>
<td>They (Gestures)</td>
</tr>
<tr>
<td>4</td>
<td>Gesture</td>
</tr>
<tr>
<td>5</td>
<td>Gestures</td>
</tr>
</tbody>
</table>

Here the common word for all of the sentences is "gesture."

Thus, the sentences can be displaced without doing any harm to the structure of the paragraph insofar as common words are used. (This is not to deny that there are other cues or sentential bonds operating.)

There are, of course, other types of structure. Some sentences describe actions of which the sequence is determined by the sequence of the sentences. A narrative is a good example of this. There is an explicit consent

5Weaver and Ness. The Fundamentals and Forms of Speech, p. 117.
between the reader and the writer that the actual sequence of the sentences indicates a sequence of actions or whatever events the sentences describe.

One can conceive that there might even be other types of structure based upon such connecting links as adverbs, synonyms, and sentence connectives. In Chapter II of this study, some of the many types of devices that relate one sentence to another thus creating various types of structure were shown.

One point that does emerge from this study is that commonality, the repetition of word or phrase or its pronominal equivalent, does exist in a large proportion of sentences in connected discourse. In fact, the sample that was reported in Chapter III shows that 88% of the sentences did contain common words.

This points to a very objective way of determining structure, and if structure can be determined in an objective way, then it seems possible to relate this structure to such other factors as reading ease.

The second point is that commonality gives an objective way of defining the paragraph. The paragraph has been defined semantically as a series of sentences grouped around one central idea. But this is a problem when one tries to do it. Many sentences in many paragraphs may be related, but what makes it necessary to put one sentence in one paragraph and not in another. This point is reinforced by
Menzel in his analysis of intersentential relationship. For he states that paragraphs should be defined in terms of sentential bonds if they can be defined at all.6

Perhaps, the most exciting thing to come from this study is the possibility that structures might be classified according to sentential relationships. This has already been done for test items.7 The author had hoped that in the original formulation of this topic that one series of sentences could be formulated or written into different types of structure and tested for recognition. This did not seem possible. That is, it did not seem possible to write the same concept into different types of structure. It seems, however, to the author that structure is somehow or other related to the concept that is being written about. For instance, if one is going to talk about an automobile engine, one is apt to introduce a large number of parts and this seems to involve a type of structure that might be described as relational.

By comparison, another kind of structure might be called conjunctive in that it seems merely to add terms together. By way of analogy consider Bruner, Goodnow, and Austin's explanation of concepts. "An apple is red, and round, and sweet." would be an example of a conjunctive

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7Ibid., pp. 147-155.
concept. On the other hand, "An apple is sweet when it is red." would be an example of a relational concept. The two kinds of concept according to Bruner are basically different. It seems that structure might vary in the same way. This is not to say that the structure would be like Bruner's concepts, but the possibility exists for classifying structures in this way.

This, of course calls for an examination of many kinds of connected discourse to see what types of structure exist as defined by sentential bonds or sentential relationships. Perhaps, this study itself should have been a descriptive study describing the various kinds of structure as they are defined by such relationships.

It may be that it is in the encoding process that sentential structure might be even more significant and useful. If there are various types of structure, then, perhaps, some of them require more intelligence or aptitude in encoding them. The difficulty lies in testing and evaluating such encoding processes.

This leads rather naturally to the area of readability. Readability indices have almost consistently been based on factors of the word and sentence. Thus, sentence length and word rarity have been used as the basis for determining readability scores. There is some indication

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that perhaps other factors might be related to reading ease or difficulty. One of these factors would be the type of relationships that exist between sentences. Again, Bormuth has made a significant study indicating that this might be so.9

It is worthy to note that writers and experimenters in the area of speech often look at a message from the top down. That is, they think of the central idea, the main idea, and the development of the main ideas. Linguistics tend to look at a message from the bottom up, that is, from the sentence to the paragraph, to a series of paragraphs. That is probably so, because most of their work is done around the sentence. It seems possible that a look at connected discourse from the latter point of view might be a fruitful exercise for those who are concerned with connected discourse.

In conclusion, the author feels that in spite of the results of this study that sentential bonds are a fruitful way of looking at connected discourse. Perhaps, the linguistics may in time contribute a theory of sentential relationships that will give us an intersentential syntax and an interparagraph syntax as well as a syntax of the sentence.

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9Bormuth, "Children's Comprehension of Between and Within Sentence Syntactic Structures," p. 105.
APPENDIX A

INTRODUCTION FOR ORAL MESSAGE

As students of communication, your teachers have taught you about many things that you are supposed to do in order to have a clear and effective message. Many aspects of these rules have not been tested; that is, we do not know for certain that if you violate them, that you will not be understood, or that you will not be effective. Today we will test two or three of these assumptions by having you listen to a speech or lecture on vocal production.

The following speech or lecture has been treated or varied in different ways to test certain assumptions about the message. We ask you to listen to it as you would if you were listening to a lecture; after which, we will ask you to take a short test.

After you have finished, we will explain to you the nature of the experiment in which you have participated. We ask you for your active participation for only in that way can we know.
APPENDIX B

TREATMENT I

Base Message Treatment

Why do we need to speak effectively? (2) First, we need to present our ideas clearly. (3) Not many people will go out of their way to listen to us—especially if they have to make an effort to do so. (4) Second, the way we speak reflects on our integrity and knowledge. (5) "If I tal' like dis, would you dink dat I am a teacher?" (6) Last, good speaking is interesting. (7) A good speaker can command attention by the way in which he speaks. (8) Radio announcers do it every day.

(9) Now, in helping you to gain a better knowledge of speaking, we will present a short discussion on the organs of speech and how the use or misuse of these can influence listening. (10) The organs of speech are grouped according to function. (11) They are the lungs, vocal folds, resonators and the articulators.

(12) The lungs furnish the power or energy to vibrate the vocal folds by supplying air pressure. (13) Now, without the air pressure there would be no voice and no speech. (14) The air pressure supplied by the lungs is directly
related to the amplitude or volume of the voice. (15) Now, other things being equal, the greater the pressure of the air, the greater the volume the voice will have.

(16) The second organ of vocal production is the vocal folds. (17) The vocal folds are two bands of fibrous tissue that lie at the top of the trachea, the outlet of the lungs. (18) When not speaking they are open, but when speaking they draw themselves together so as to form two parallel bands. (19) The air pressure against their lower side causes them to vibrate, thus producing the sound of the voice.

(20) The number of vibrations per second that the vocal folds vibrate determine the pitch of the sound. (21) For instance, the human ear perceives the average male voice to be lower in pitch than the mature female voice. (22) Now, this is due to the fact that the male vocal folds vibrate the air fewer times per second than does the female voice. (23) Thus, as a general rule, it can be said that the higher the rate of vibration, the higher the pitch will be.

(24) The sound as emitted by the vocal folds is complex and may be analyzed into parts according to the rate of vibration or frequency. (25) The fundamental is of low frequency and is heard as the pitch of the voice. (26) The overtones are of high frequency and are heard as the
coloration or timbre of the voice. (27) Hence, each sound is a combination of fundamentals and overtones.

(28) The vocal folds are capable of producing tones or sounds of varying pitches. (29) Thus, it is well known that we can make our voice sing a melody, a melody being by definition a series of sounds or tones along a scale. (30) This change of pitch in a pattern is known as inflection, one of the more important factors of effective speaking.

(31) The third factor in the production of speech are the resonators. (32) In order to understand the function of the resonators, it is necessary to understand something of their structure and how sound is modified by them. (33) A resonator can be of two types: enclosed air spaces or sounding boards. (34) Either type vibrates sympathetically with the vibrating body. (35) This is to say that a resonator vibrates with the same frequency and in the same way that a physical body vibrates. (36) This sympathetic vibration either amplifies the basic tone or changes it by suppressing some overtones and amplifying others. (37) Thus, we sound differently when singing in the shower because the shower room amplifies and modifies our voice. (38) What frequencies are amplified or suppressed depends upon the shape, size and physical characteristics of the resonator.
(39) Now, the throat, mouth and nasal passages are organs that enclose air spaces, and thus, they function as resonators. (40) As with all resonators, they modify the sound of the voice as it is emitted by the vocal folds. (41) Because this modification depends upon physical characteristics of the resonator, our voice changes when we have a cold or when we change the opening of our mouth. (42) For instance, the sound [i] sounds differently than that of [a] because of the change in our mouth which is a resonator.

(43) The fourth set of organs used in vocal production are the articulators. (44) The articulators are the lips, teeth, tongue and soft palate. (45) They modify the basic tone by impeding the sound as in the consonants or by modifying the resonance as in the case of the vowels. (46) For instance, to produce the consonant "t" or [t], our tongue is placed on the gum line of the upper teeth, thus blocking the sound and producing a consonant. (47) The vowels, however, are produced by changing the volume and shape of the mouth relatively closed, while the vowel sound [u] is produced with the mouth wider and more oval. (49) The output of the articulators is, of course, speech.

(50) The speed of articulation is known as rate, (51) Rate is a function of, first, the number of words-per-minute; second, pauses; third, the quantity of the vowels. (52) A normal speaker varies from 125 to 185
This rate, of course, may vary from instant to instant. A pause is a break in the flow of words which may be intentional or unintentional. Quantity refers to the length of the vowel sounds. For instance, the sound [i] may be short or long in terms of its duration as in the case of "we'd" and "weed."

This consideration of the bases of speech gives us what one author calls the vocal variables. The vocal variables are five in number and they may be defined as the vocal factors of voice which a good speaker can and must try to vary in order to be interesting and effective. These vocal variables are quality, force, rate, articulation and pitch. We will give one or two factors of each which contribute to effective speaking.

Good quality is mainly a function of the resonators. In order to produce a good quality, such resonators as the nasal passages must be clear and the throat relatively relaxed. Tense throat muscles and a nose crowded with mucus produce undesirable quality as you may have experienced when you have a cold. Notice the change in my voice as I tighten my throat muscles.

Force is the amplitude or volume of the voice. Obviously, a speaker must speak loud enough to be heard, but in addition, he must emphasize the words that carry the impact of the message by saying certain words louder. This word stress increases the ability of
the listener to comprehend the words that are important in the message. (68) Notice the difference between the sentences: "The book is on the table" and "The book is ON the table." (69) By emphasizing the word "on," the meaning of the sentence is much clearer.

(70) Rate, too, must be adjusted to the size of the audience and the difficulty of the material. (71) But even more important, the speaker must use proper phrasing which is an aspect of rate. (72) Proper phrasing is due to the proper use of pauses which break information into more meaningful parts for comprehension. (73) For instance, a typical spoken sentence in formal discourse may have one or two pauses in it. (74) Longer pauses will appear between sentences especially if they are important. (75) In fact, the chief use of the pause is to show the essential relationships between sentences and paragraphs. (76) Sentences and words with pauses before and after them seem to have greater importance. (77) Speeches delivered without pauses or poorly placed pauses are difficult to listen to and also fail to be interesting.

(78) Articulation can be described as lax or tense. (79) In lax articulation, the sounds are poorly enunciated as in the sentence, "This is a nice day." (80) In tense articulation, the sounds are overly enunciated as in the sentence, "This is a nice day." (81) Obviously, the correct answer is that articulation should be clear enough to
hear, but not so tense as to call attention to itself.  
(82) Articulation is also important for emphasis.  (83) Accordingly, if a speaker wishes to emphasize an important word, he need only to articulate or enunciate it more exactly.  
(84) The pitch of the voice can, of course, be changed and this change as it occurs in the normal speaking voice is known as inflection.  (85) Inflection is important in conveying feelings of love, hate and is equally important in avoiding monotony.  (86) The announcers of WHLO (WTVN) know this and use it to convey a feeling of excitement.  
(87) In summary, we might say the faults of the inexperienced speaker are poor word stress, every word is said much the same way; lack of inflection, the speaker talks in a monotone; and last, lack of proper phrasing, the speaker either never stops or stops too often and in the wrong places.
APPENDIX C

TREATMENT II-A

Sentences Displaced in Such a Way That Commonality is Reduced

(1) Why do we need to speak effectively? (2) First, we need to present our ideas clearly. (3) Not many people will go out of their way to listen to us—especially if they have to make an effort to do so. (4) Second, the way we speak reflects on our integrity and knowledge. (5) "If I tal' like dis, would you dink dat I am a teacher"? (6) Last, good speaking is interesting. (7) A good speaker can command attention by the way in which he speaks. (8) Radio announcers do it every day.

(9) Now, in helping you to gain a better knowledge of speaking, we will present a short discussion on the organs of speech and how the use or misuse of these can influence listening. (11) They are the lungs, vocal folds, resonators, and the articulators.

(12) The lungs furnish the power or energy to vibrate the vocal folds by supplying air pressure. (10) The organs of speech are grouped according to function. (13) Now, without air pressure, there would be no voice and no speech.
The second organ of vocal production is the vocal folds. The air pressure supplied by the lungs is directly related to the amplitude or the volume of the voice. When not speaking, they, the vocal folds, are open, but when speaking they draw themselves together as to form two parallel bands. The vocal folds are two bands of fibrous tissue that lie at the top of the trachea, the outlet of the lungs. Now, other things being equal, the greater the pressure of the air, the greater the volume the voice will have. The air pressure against their lower side causes them to vibrate thus producing the sound of the voice.

For instance, the human ear perceives the average male voice to be lower in pitch than the mature female voice. The number of vibrations per second that the vocal folds vibrate determine the pitch of the sound. The overtones are of high frequency and are heard as the coloration or timbre of the voice. Now, this is due to the fact that the male vocal folds vibrate the air fewer times per second than does the female voice. The fundamental is of low frequency and is heard as the pitch of the voice. Thus, as a general rule, it can be said that the higher the rate of vibration, the higher the pitch will be.

The sound as emitted by the vocal folds is complex and may be analyzed into parts according to
the rate of vibration or frequency. Hence, each sound is a combination of fundamentals and overtones. Thus, it is well known that we can make our voice sing a melody, a melody being by definition a series of sounds or tones along a scale. The vocal folds are capable of producing tones or sounds of varying pitches.

The third factor in the production of speech are the resonators. This change of pitch in a pattern is known as inflection, one of the more important factors of effective speaking. Either type vibrates sympathetically with the vibrating body. In order to understand the function of the resonators, it is necessary to understand something of their structure and how sound is modified by them. This sympathetic vibration either amplifies the basic tone or changes it by suppressing some overtones and amplifying others.

A resonator can be of two types: enclosed air spaces or sounding boards. Thus, we sound differently when singing in the shower room because the shower room amplifies and modifies our voice. This is to say that the resonator vibrates with the same frequency and in the same way that a physical body vibrates. What frequencies are amplified or suppressed depends upon the shape, size, and physical characteristics of the
resonator. (41) Because this modification depends upon the physical characteristics of the resonator, our voice changes when we have a cold or when we change the opening of our mouth.

(40) As with all resonators, they modify the sound of the voice as it is emitted by the vocal folds. (39) Now, the throat, mouth and nasal passages are organs that enclose air spaces, and thus, they function as resonators. (44) The articulators are the lips, teeth, tongue and soft palate. (42) For instance, the sound [i] sounds differently than that of [a] because of the change in our mouth which is a resonator.

(43) The fourth set of organs used in vocal production are the articulators. (46) For instance, to produce the consonant "t" or [t], our tongue is placed on the gum line of the upper teeth, thus blocking the sound and producing a consonant. (45) They modify the basic tone by impeding the sound as in the consonants or by modifying the resonance as in the case of the vowels. (48) The vowel sound [i] is produced with the mouth relatively closed, while the vowel sound [u] is produced with the mouth wider and more oval. (49) The output of the articulators is, of course, speech. (47) The vowels, however, are produced by changing the volume and shape of the mouth.
The speed of articulation is known as rate. A normal speaker varies from 125 to 185 words-per-minute. Quantity refers to the length of the vowel sounds. Rate is a function of, first, the number of words-per-minute, second, pauses, and third, the quantity of the vowels. For instance, the sound [i] may be short or long in terms of its duration as in the case of "we'd" and "weed." A pause is a break in the flow of words which may be intentional or unintentional. This rate, of course, may vary from instant to instant. This consideration of the bases of speech gives us what one author calls the vocal variables.

The vocal variables are five in number and they may be defined as the vocal factors of voice which a good speaker can and must try to vary in order to be interesting and effective. These vocal variables are quality, force, rate, articulation, and pitch. We will give one or two factors of each which contribute to effective speaking.

Tense throat muscles and a nose crowded with mucus produce undesirable quality as you may have experienced when you have a cold. In order to produce good quality, the resonators, such as the nasal passages must be clear and the throat relatively relaxed. Notice the change in my voice as I tighten my throat muscles. Good quality is mainly a function of the
resonators. (67) This word stress increases the ability of the listener to comprehend the words that are important in the message. (65) Force is the amplitude or volume of the voice. (68) Notice the difference between the sentences: "The book is on the table." and "The book is ON the table." (66) Obviously, a speaker must speak loud enough to be heard, but in addition, he must emphasize the words that carry the impact of the message by saying certain words louder. (69) By emphasizing the word, "on," the meaning of the sentence is much clearer.

(72) Proper phrasing is due to the proper use of pauses which break information into more meaningful parts for comprehension. (70) Rate, too, must be adjusted to the size of the audience and the difficulty of the material. (73) For instance, a typical spoken sentence in formal discourse may have one or two pauses in it. (71) But even more important, the speaker must use proper phrasing, which is an aspect of rate. (74) Longer pauses will appear between sentences, if they are important. (76) Sentences and words with pauses before and after them seem to have greater importance. (75) In fact, the chief use of the pause is to show the essential relationships between sentences and paragraphs. (77) Speeches delivered without pauses or poorly placed pauses are difficult to listen to and also fail to be interesting.
In tense articulation, the sounds are overly
enunciated as in the sentence: "This is a nice day."
Articulation can be described as lax or tense. Articulation is also important for emphasis. In lax
articulation the sounds are poorly enunciated as in the
sentence, "This is a nice day." Obviously, the cor-
rect answer is that articulation should be clear enough
to be heard but not so tense as to call attention to itself.
Inflection is important in conveying feelings of
love, hate, and is equally important in avoiding monotony.
Accordingly, if a speaker wishes to emphasize an
important word, he need only to articulate or enunciate
it more exactly. The pitch of the voice can, of
course, be changed and this change as it occurs in the
normal speaking voice is known as inflection. The
announcers of WHLO (WTVN) know this and use it to convey
a feeling of excitement.
In summary, we might say the faults of the
inexperienced speaker are poor word stress, every word is
said much the same way; lack of inflection, the speaker
talks in a monotone; and last, lack of proper phrasing,
the speaker either never stops or stops too often and in
the wrong places.
APPENDIX D

TREATMENT II-B

Sentences So Displaced That Commonality Is Maintained

(1) Why do we need to speak effectively? (2) First we need to present our ideas clearly. (3) Not many people will go out of their way to listen to us—especially if they have to make an effort to do so. (4) Second, the way we speak reflects on our integrity and knowledge. (5) "If I talk like this, would you think that I am a teacher?" (6) Last, good speaking is interesting. (7) A good speaker can command attention by the way in which he speaks. (8) Radio announcers do it every day.

(9) Now, in helping you to gain a better knowledge of speaking, we will present a short discussion on the organs of speech and how the use or misuse of these can influence listening.

(10) The organs of speech are grouped according to function. (11) They are the lungs, vocal folds, resonators and the articulators.

(14) The air pressure supplied by the lungs is directly related to the amplitude or volume of the voice. (12) The lungs furnish the power or energy to vibrate the
vocal folds by supplying air pressure. (15) Now, other things being equal, the greater the pressure of the air, the greater the volume the voice will have. (13) Now, without the air pressure, there would be no voice and no speech.

(16) The second organ of vocal production is the vocal folds. (19) The air pressure against their lower side causes them to vibrate, thus producing the sound of the voice. (17) The vocal folds are two bands of fibrous tissue that lie at the top of the trachea, the outlet of the lungs. (18) When not speaking, they are open but when speaking they draw themselves together as to form two parallel bands.

(21) For instance, the human ear perceives the average male voice to be lower in pitch than the mature female voice. (22) Now, this is due to the fact that the male vocal folds vibrate the air fewer times per second than does the female voice. (20) The number of vibrations per second that the vocal folds vibrate determine the pitch of the sound. (23) Thus, as a general rule, it can be said that the higher the rate of vibration, the higher the pitch will be.

(24) The sound as emitted by the vocal folds is complex and may be analyzed into parts according to the rate of vibration or frequency. (27) Hence, each sound is a combination of fundamentals and overtones. (26) The
overtones are of high frequency and are heard as the coloration of timbre of the voice. (25) The fundamental is of low frequency and is heard as the pitch of the voice.

(28) The vocal folds are capable of producing tones or sounds of varying pitches. (30) This change of pitch in a pattern is known as inflection, one of the more important factors of effective speaking. (29) Thus, it is well known that we can make our voice sing a melody, a melody being by definition a series of sounds or tones along a scale.

(31) The third factor in the production of speech are the resonators. (32) In order to understand the function of the resonators, it is necessary to understand something of their structure and how sound is modified by them. (38) What frequencies are amplified or suppressed depends upon the shape, size, and physical characteristics of the resonator. (35) This is to say that a resonator vibrates with the same frequency and in the same way that a physical body vibrates. (33) A resonator can be of two types: enclosed air spaces or sounding boards. (34) Either type vibrates sympathetically with the vibrating body. (36) This sympathetic vibration either amplifies the basic tone or changes it by suppressing some overtones and amplifying others. (37) Thus, we sound differently
when singing in the shower because the shower room amplifies and modifies our voice.

(42) For instance, the sound [i] sounds differently than that of [a] because of the change in our mouth which is a resonator. (39) Now, the throat, mouth, and nasal passages are organs that enclose air spaces, and thus, they function as resonators. (41) Because this modification depends upon physical characteristics of the resonator, our voice changes when we have a cold or when we change the opening of our mouth. (40) As with all resonators, they modify the sound of the voice as it is emitted by the vocal folds.

(43) The fourth set of organs used in vocal production are the articulators. (45) They modify the basic tone by impeding the sound as in the consonants or by modifying the resonance as in the case of the vowels. (44) The articulators are the lips, teeth, tongue and soft palate. (46) For instance, to produce the consonant "t" of [t], our tongue is placed on the gum line of the upper teeth, thus blocking the sound and producing a consonant. (48) The vowel [i] is produced with the mouth relatively closed, while the vowel sound [u] is produced with the mouth wider and more oval. (47) The vowels, however, are produced by changing the volume and shape of the mouth. (49) The output of the articulators is, of course, speech.
(51) Rate is a function of, first, the number of words-per-minute, second, pauses, and third, the quantity of the vowels. (50) The speed of articulation is known as rate. (55) Quantity refers to the length of the vowel sound. (56) For instance, the sound [i] may be short or long in terms of its duration as in the case of "we'd" and "weed." (52) A normal speaker varies from 125 to 185 words-per-minute. (53) This rate, of course, may vary from instant to instant. (54) A pause is a break in the flow of words which may be intentional or unintentional.

(57) This consideration of the bases of speech gives us what one author calls the vocal variables. (58) The vocal variables are five in number and they may be defined as the vocal factors of voice which a good speaker can and must try to vary in order to be interesting and effective. (59) These vocal variables are quality, force, rate, articulation, and pitch. (60) We will give one or two factors of each which contribute to effective speaking.

(62) In order to produce a good quality, such resonators, as the nasal passages must be clear and the throat relatively relaxed. (64) Notice the change in my voice as I tighten my throat muscles. (63) Tense throat muscles and a nose crowded with mucus produce undesirable quality as you may have experienced when you have a cold. (61) Good quality is mainly a function of the resonators.
Notice the difference between the sentences: "The book is on the table" and "The book is on the table."

By emphasizing the word "on," the meaning of the sentence is much clearer. This word stress increases the ability of the listener to comprehend the words that are important in the message.

Force is the amplitude or volume of the voice. Obviously, a speaker must speak loud enough to be heard, but, in addition, he must emphasize the words that carry the impact of the message by saying certain words louder.

Rate, too, must be adjusted to the size of the audience and the difficulty of the material. But even more important, the speaker must use proper phrasing which is an aspect of rate. For instance, a typical spoken sentence in formal discourse may have one or two pauses in it. Proper phrasing is due to the proper use of pauses which break information into more meaningful parts for comprehension.

Longer pauses will appear between sentences, especially if they are important. Sentences and words with pauses before and after them seem to have greater importance. In fact, the chief use of the pause is to show the essential relationships between sentences and paragraphs. Speeches delivered without pauses or poorly placed pauses are difficult to listen to and also fail to be interesting.
(78) Articulation can be described as lax or tense. (80) In tense articulation, the sounds are overly enunciated as in the sentence, "This is a nice day." (79) In lax articulation, the sounds are poorly enunciated as in the sentence "This is a nice day." (81) Obviously, the correct answer is that articulation should be clear enough to hear, but not so tense as to call attention to itself. (83) Accordingly, if a speaker wishes to emphasize an important word, he need only to articulate or enunciate it more exactly. (82) Articulation is also important for emphasis.

(85) Inflection is important in conveying feelings of love, hate and is equally important in avoiding monotony. (86) The announcers of WHLO (WTVN) know this and use it to convey a feeling of excitement. (84) The pitch of the voice can, of course, be changed and this change as it occurs in the normal speaking voice is known as inflection.

(87) In summary, we might say the faults of the inexperienced speaker are poor word stress, every word is said much the same way; lack of inflection, the speaker talks in a monotone; and last, lack of proper phrasing, the speaker either never stops or stops too often and in the wrong places.
APPENDIX E

TREATMENT III

Differentiation

(1) Why do we need to speak effectively? (2) First, we need to present our ideas clearly. (3) Not many people will go out of their way to listen to us—especially if they have to make an effort to do so. (4) Second, the way we speak reflects on our integrity and knowledge. (5) "If I tal' like dis, would you dink dat I am a teacher?" (6) Last, good speaking is interesting. (7) A good speaker can command attention by the way in which he speaks. (8) Radio announcers do it every day.

(9) In helping you to gain a better knowledge of speaking, we will present a short discussion on the organs of speech and how the use or misuse of these can influence listening.

(10) The organs of speech are grouped according to function. (11) They are the lungs, vocal folds, resonators, and the articulators.

(12) The lungs furnish the power or energy to vibrate the vocal folds by supplying air pressure. (13) There would be no voice and no speech without air pressure.
The air pressure supplied by the lungs is directly related to the amplitude or volume of the voice. The volume of the voice is dependent on the pressure of the air.

The vocal folds are two bands of fibrous tissue that lie at the top of the trachea, the outlet of the lungs. They are open when not speaking, but draw themselves together as to form two parallel bands during speech. The air pressure against their lower side causes them to vibrate, thus producing the sound of the voice.

The number of vibrations per second that the vocal folds vibrate determine the pitch of the sound. The human ear perceives the average male voice to be lower in pitch than the mature female voice. The male vocal folds vibrate the air fewer times per second than does the female voice. The higher the rate of vibration of the vocal folds the higher the pitch will be.

The sound as emitted by the vocal folds is complex and may be analyzed into parts according to the rate of vibration or frequency. The fundamental is of low frequency and is heard as the pitch of the voice. The overtones are of high frequency and are heard as the coloration or timbre of the voice. Each sound is a combination of fundamentals and overtones.

The vocal folds are capable of producing tones or sounds of varying pitches. We can make our
voice sing a melody, a melody being by definition a series of sounds or tones along a scale. (30) A change of pitch in a pattern is known as inflection.

(32) The function of the resonators can be understood by studying their structure and how sound is modified by them. (33) A resonator can be of two types: enclosed air spaces or sounding boards. (34) Either type vibrates sympathetically with the vibrating body. (35) A resonator vibrates with the same frequency and in the same way that a physical body vibrates. (36) This sympathetic vibration either amplifies the basic tone or changes it by suppressing some overtones and amplifying others. (37) We sound differently when singing in the shower because the shower room amplifies and modifies our voice. (38) The frequencies that are amplified or suppressed depends upon the shape, size, and physical characteristics of the resonator.

(39) The throat, mouth and nasal passages are organs that enclose air spaces; they function as resonators. (40) They modify the sound of the voice as it is emitted by the vocal folds. (41) The modification of our voice depends upon physical characteristics of the resonator, our voice changes when we have a cold or when we change the opening of our mouth. (42) the sound \([i]\) sounds differently than that of \([a]\) because of the change in our mouth which is a resonator.
(44) The articulators are the lips, teeth, tongue and soft palate. (45) They modify the basic tone by impeding the sound as in the consonants or by modifying the resonance as in the case of the vowels. (46) To produce the consonant "t" or [t], our tongue is placed on the gum line of the upper teeth, thus blocking the sound and producing a consonant. (47) The vowels are produced by changing the volume and shape of the mouth. (48) The vowel sound [i] is produced with the mouth relatively closed, while the vowel sound [u] is produced with the mouth wider and more oval. (49) The output of the articulators is speech.

(50) The speed of articulation is known as rate. (51) Rate is a function of the number of words-per-minute, pauses and the quantity of the vowels. (52) A normal speaker varies from 125 to 185 words-per-minute. (53) This rate may vary from instant to instant. (54) A pause is a break in the flow of words which may be intentional or unintentional. (55) Quantity refers to the length of the vowel sounds. (56) The sound [i] may be short or long in terms of its duration as in the case of "we'd" and "weed."

(58) The vocal variables are five in number and they may be defined as the vocal factors of voice which a good speaker can and must try to vary in order to be interesting
and effective. (59) These vocal variables are quality, force, rate, articulation and pitch.

(61) Good quality is mainly a function of the resonators. (62) A good quality is produced when the resonators, such as the nasal passages, are clear and the throat relatively relaxed. (63) Tense throat muscles and a nose crowded with mucus produce undesirable quality. (64) Notice the change in my voice as I tighten my throat muscles.

(65) Force is the amplitude or volume of the voice. (66) A speaker must speak loud enough to be heard; he must emphasize the words that carry the impact of the message by saying certain words louder. (67) Word stress increases the ability of the listener to comprehend the words that are important in the message. (68) Notice the difference between the sentences: "The book is on the table." and "The book is ON the table." (69) Emphasis on the word "on" increases the clarity of the sentence.

(70) Rate must be adjusted to the size of the audience and the difficulty of the material. (71) The speaker must use proper phrasing which is an aspect of rate. (72) Proper phrasing is due to the proper use of pauses which break information into more meaningful parts for comprehension. (73) A typical spoken sentence in formal discourse may have one or two pauses in it. (74) Longer pauses will appear between sentences—especially
if they are important. (75) The chief use of the pause is to show the essential relationships between sentences and paragraphs. (76) Sentences and words with pauses before and after them seem to have greater importance. (77) Speeches delivered without pauses or poorly placed pauses are difficult to listen to and also fail to be interesting.

(78) Articulation can be described as lax or tense. (79) The sounds are poorly enunciated as in the sentence, "This is a nice day." in lax articulation. (80) The sounds are overly enunciated as in the sentence, "This is a nice day." in tense articulation. (81) Articulation should be clear enough to hear, but not so tense as to call attention to itself. (82) Articulation is important for emphasis. (83) A speaker wishes to emphasize an important word by articulating or enunciating it more exactly.

(84) The pitch of the voice can be changed; a change in the normal speaking voice is known as inflection. (85) Inflection is important in conveying feelings of love, hate and is equally important in avoiding monotony. (86) The announcers of WHLO (WTVN) know this and use it to convey a feeling of excitement.

(87) In summary, we might say the faults of the inexperienced speaker are poor word stress, every word is said much the same way; lack of inflection, the speaker talks in a monotone; and last, lack of proper phrasing,
the speaker either never stops or stops too often and in the wrong places.
APPENDIX F

Index of Sentence Order and Changes for Respective Treatments

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aTreatment I—Base Message; Treatment II-A—Displacement of sentences in such a way that commonality is reduced; Treatment II-B—Displacement of sentences in such a way that commonality is maintained; Treatment III—Differentiation.

A dash indicates the deletion of a sentence. The asterisk after a sentence number indicates that the sentence has been altered in reference to the same sentence in Treatment I.

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<table>
<thead>
<tr>
<th>Treatment I</th>
<th>Treatment II-A</th>
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APPENDIX G

Test Booklet

Instructions:

1. Be sure to put your name on the answer sheet provided.

2. Pick the most correct answer from those given by marking thus with a #2 pencil provided.

3. Give only one answer per question.

4. Try to answer all questions.

5. Please do not mark on the test booklet.
1. Was the message organized
   a. very poorly
   b. poorly
   c. average
   d. good
   e. very good

2. Was the message interesting
   a. not at all
   b. slightly
   c. average
   d. above average
   e. very interesting

3. Was the message clear
   a. very vague
   b. vague
   c. average
   d. clear
   e. very clear

4. "I learned from the message"
   a. strongly disagree
   b. disagree
   c. don't know
   d. agree
   e. strongly agree

# # # # # #

5. Consonants are articulated by
   # a. impeding or blocking the flow of air in the voice.
   b. changing the resonance.
   c. using the lips.
   d. by controlling the flow of air.

6. Phrasing is an aspect of
   a. quality.
   b. stress.
   # c. rate.
   d. articulation.

* Asterisk indicates correct answer.
7. A resonator changes the voice by  
   a. amplifying the fundamental.  
*   b. suppressing some overtones and amplifying others.  
   c. amplifying the overtones.  
   d. suppressing some overtones.

8. Good quality is mainly a function of  
*   a. the resonators.  
   b. the vocal folds.  
   c. the lungs.  
   d. the articulators.

9. The lungs  
*   a. function as the power source for vocal production.  
   b. have no direct relationship to vocal production.  
   c. are important in the process of resonation.  
   d. cannot be separated from other processes of vocal production.

10. The average rate of speaking is  
   a. 135 to 185 words-per-minute.  
*   b. 125 to 175 words-per-minute.  
   c. 125 to 185 words-per-minute.  
   d. a concept that may vary from instant to instant.

11. The overtones are heard as  
   a. the pitch of the voice.  
   b. words or syllables.  
*   c. the timbre or coloration of the voice.  
   d. the amplitude or volume of the voice.

Match left column, vocal mechanism, with their function in the right column:

<table>
<thead>
<tr>
<th>Vocal Mechanisms</th>
<th>Vocal Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. lungs (c)</td>
<td>a. amplification and modification of vocal tone.</td>
</tr>
<tr>
<td>13. resonators (A)</td>
<td>b. pitch</td>
</tr>
<tr>
<td>14. articulators (D)</td>
<td>c. amplitude</td>
</tr>
<tr>
<td>15. vocal folds (B)</td>
<td>d. formation of phonetic sounds</td>
</tr>
<tr>
<td>16. nasal passages (A)</td>
<td></td>
</tr>
</tbody>
</table>

17. Amplitude or force is most directly related to  
   a. the volume of air in the lungs.  
*   b. the pressure of the air against the vocal folds.  
   c. the speed at which the vocal folds are vibrating.  
   d. the type of articulation.
18. The difference between voice and speech is
   a. articulation.
   b. resonance.
   c. syllables or phonetic sounds.
   * d. a & c above.

19. The sounds which resonators emit depend upon
   a. their size.
   b. their shape.
   c. their physical characteristics.
   * d. all of the above.

20. The faster the vocal folds vibrate
   * a. the higher the pitch will be
   b. the greater the amount of air in the lungs.
   c. the lower the pitch will be because of an inverse
      relationship between rate of vibration and pitch.
   d. the greater the amplitude of the voice.

21. A resonator
   a. generates the basic tone.
   * b. amplifies and modifies the basic tone.
   c. controls the pitch.
   d. breaks the sound into syllables.

22. The use of the pause is
   a. always effective.
   b. sometimes effective.
   * c. effective when used for emphasis
   d. more than likely a subjective factor.

Match the fault with the vocal organ(s)

<table>
<thead>
<tr>
<th>Faults</th>
<th>Vocal Organ (s)</th>
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<tbody>
<tr>
<td>23. poor quality (B)</td>
<td>a. lungs</td>
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<tr>
<td>24. poor stress (A)</td>
<td>b. resonators</td>
</tr>
<tr>
<td>25. monotone (C)</td>
<td>c. vocal folds</td>
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<tr>
<td>26. improper phrasing (D)</td>
<td>d. articulators</td>
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<tr>
<td>27. fast rate (D)</td>
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<tr>
<td>28. poor enunciation (D)</td>
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</table>

29. The resonators of the vocal mechanism are
   a. the teeth, lips, tongue and soft palate.
   b. the throat, mouth and tongue.
   c. the nasal passages, the throat and lips.
   * d. the throat, mouth and nasal passages.
30. If a speaker has weak lung power, he would speak
   a. flat, without inflection.
   * b. softly, with not much force.
   c. with poor quality.
   d. with poor articulation.

31. Word stress is an aspect of
   a. articulation.
   b. quality.
   * c. amplitude or force.
   d. vocal resonance.

32. We sound differently when we have a "stuffy" head
   because
   a. the vocal folds are sluggish.
   b. articulation is inexact.
   * c. the resonators function differently.
   d. of pitch changes.

Match vocal variables on the right with certain aspects of them on the left.

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Vocal Variables</th>
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<tbody>
<tr>
<td>Sentence relationship</td>
<td>a. Force</td>
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<tr>
<td>Relaxed throat</td>
<td>b. Rate</td>
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<tr>
<td>Inflection</td>
<td>c. Quality</td>
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<td>Word Stress</td>
<td>d. Pitch</td>
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<td>Monotone</td>
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<td>Pausing</td>
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39. Inflection is
   a. the number of vibrations per second.
   b. the sympathetic vibration of a resonator.
   c. a function of the fundamental.
   * d. a series or pattern of pitch changes.

40. If you wish to emphasize a point
   a. articulate it more precisely.
   b. use pauses before and after the words
   c. give greater stress to the words.
   * d. all of the above.

41. If the vocal folds were sounding without the resonators
   a. a speaker would not be able to speak with inflection.
   b. a speaker could not articulate words.
   * c. the quality of the voice would be changed.
   d. there would be no sound at all.
42. Articulation is produced by
   a. teeth and tongue.
   b. lips and teeth.
   c. lips, teeth, and soft palate.
   * d. all of the above.

43. Inflection is important in avoiding monotony, but it is also important in
   a. conveying moods and feelings.
   b. word stress.
   * c. phrasing.
   d. vocal quality.

44. The pitch of the voice is determined by
   a. the vocal resonators.
   * b. the number of vibrations.
   c. the air pressure from the lungs.
   d. the overtones.

45. Vowels are produced by
   a. impeding the flow of the voice.
   * b. a change of resonance.
   c. by use of the tongue.
   d. by controlling the flow of air.
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