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ABSTRACT

AN INVESTIGATION OF THE EFFECTS
OF INCORRECT GRAMMAR ON ATTITUDE AND
COMPREHENSION OF WRITTEN ENGLISH MESSAGES

by Robert A. Sencer

This study is an experimental investigation of the effects on readers of grammatical error in written English. The dependent variables were assessment of quality writing, attitude toward the writing, and comprehension. The study grew out of many years of experience in teaching composition and writing at collegiate undergraduate and graduate levels and the informal observations over those years of the apparent fact that grammatical error did not seem to affect comprehension nearly as much as it affected the attitude of the reader toward the writing.

Language theorists have posited that the English language is highly redundant in a number of ways. If this is true, then errors in grammar might be overcome somewhat by redundancy, it was hypothesized. However, the fact of grammatical error seemed to indicate also that if the incidence of error was perceived such perception would have some effect on the reader. Language theorists also had posited that in addition to comprehension or perceiving the conceptual meaning of written text, there was the possibility of an attitudinal component to the reading response. It was hypothesized, therefore, that it would be the attitudinal part of the response that would be affected by the incidence of grammatical error.

Practice among collegiate educators and administrators has been to predict students' success in college partly by an examination of their verbal aptitudes as measured by the College Board SAT-Verbal. Since these measures are used also to discriminate among students in terms of reading ability, it was hypothesized that different levels of verbal aptitude would have some effect on the differential responses, if any, caused by different degrees of grammatical error.

The study included an experimental situation wherein 350 male college freshmen were given 1200-word essays to read, followed immediately by quality assessment, comprehension, and attitude tests. Five degrees of grammatical error were used, ranging from zero error to a degree containing some 51 errors within about 500 words. Grammatical error was defined as that contained commonly in some 32 college-level composition handbooks of recent publication and as defined in Themes, Theories, and Therapy (Kitzhaber, 1963). Measures of quality assessment, of attitude, and of comprehension were made and appropriately analyzed.

The results of the study show (1) that the incidence of error was perceived by the Ss; (2) that attitude toward the message was affected by grammatical error; (3) that comprehension appeared not to be affected by grammatical error; (4) that level of verbal aptitude did have an effect on the perception of error; (5) that level of verbal aptitude did not have significant effect on attitude, but that there was some interaction between verbal aptitude and attitude; and (6) that verbal aptitude did not appear to have an effect on comprehension.

The study suggests that the concept of "incorrectness" as used commonly by English teachers and critics of writing needs further study and that the area of response to written messages needs further study.

AN INVESTIGATION OF THE EFFECTS OF INCORRECT GRAMMAR ON ATTITUDE AND COMPREHENSION IN WRITTEN ENGLISH MESSAGES

by

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PREFACE

The Project English Research Conference report, Needed Research in the Teaching of English (1963), states that there are several problems which should be studied carefully and soon.

> The problem which was mentioned most often in the papers and discussion groups and on which the conferees probably spent more discussion time than any others was the effective use of language. The first question was whether grammar should be taught at all and, if so, which grammar: traditional, structural, generative, or some synthesis of all three. The next question was the relevance of grammar in one form or another to the teaching of writing. Research suggests strongly that there is little correlation between an understanding of grammar and the ability to write well.
>
> (Needed Research ..., p. 126).

In "Needed Research in the Language Arts," (Research Methods in the Language Arts, 1961, p. iv) Dr. Carlton M. Singleton says:

> However, an examination of the teaching of English in today's schools suggests a need for more than a compilation of research suggestions. Despite the findings of the past, today's teacher of English must be shocked when he realizes how little we know. We are still unable to describe the teaching-learning process accurately; to guide students to a full and efficient use of their talents; or even to describe and delimit that which must be taught. ...The true answer [to the problem of knowing what to teach] is that we know little more today about the teaching of English than we knew fifty years ago.
>
> Usage, grammar, and composition are taught now as they were in 1910 despite prettier textbooks and better trained teachers.
>
> Research, praiseworthy as it is, has demonstrated but little of that which we need to know to teach English well. If the present rate of progress is to continue it may well be a

> thousand years hence before much improvement in our teaching is evident. We can't wait. We need a miracle.

One of the particular problems in trying to "know" more about how to teach English is finding out how the various elements which seem to constitute "good" English affect the reader. Many studies have been done in which the scores of the dependent variable have been based on teacher evaluation: Anderson, 1940; Anderson, 1960; Banargee, 1939; Buck, Paxton, and Hyndman, 1961; Coward, 1955; Diederich, French, and Carlton, 1961; Foster, 1928; Gerber, 1948; Huddleston, 1952; Kitzhaber, 1963; Mann, 1944; Norberg, 1951; Perrin, 1933; Powell, 1934; Smith, 1956; Thompson, 1955; Toporpwski, 1958; ad infinitum. But in the experience of this writer there have been no studies which attempt to assess the effect of "good" writing, or bad, on what might be considered the "normal" reader.

It should be noted that only recently, during the Project English Research Conference mentioned earlier, have English teachers, particularly those interested in research, come to ask questions about how best to teach students to write better, and about the need for overt and conscious cognitive behavior on the part of the student.

The 1959 report of the Modern Language Association, "The Basic Issues in the Teaching of English," (PMLA, 1959) indicates quite clearly that English teachers in the United States are anything but satisfied with what has been accomplished in this area to date.

When we proceed to look at the present state of English in the United States, from the kindergarten through the graduate school, we find that the many years of exposure to the subject and the good and simple reasons for studying it seldom combine to form a satisfying picture. Some hostile critics have said that if as much student time were spent on any other subject with so little in the way of results, it would be a national scandal. Defenders would reply that English is extremely broad and general, the results are not easy to measure [my italics], and the efficacy of English teaching should not be judged by its poorest products.

(PMLA, 1959).

CHAPTER I

THEORETICAL RATIONALE

There is need for research into language problems such as the effects of incorrect grammar on whatever criteria we can muster and for which we can devise some reasonable methodology for their measurement. This is not a new idea at all. In 1712 Jonathan Swift published A Proposal for Correcting, Improving, and Ascertaining the English Tongue. Though probably not the first English grammar, Swift's attempt was certainly one of the very early ones and was followed by a continuing series of similar attempts to make the language better, or at least better used, to make people use it "correctly," and to describe it accurately. This series, although in no way a formal one, is still continuing, and at present seems to be enjoying a heightened popularity.

Teachers of English, speech, and all the language arts have assumed that "correctness" in grammar was a universal perfection to be achieved by anyone who wanted to be considered "educated," or "a gentleman," or "an effective speaker." The justification for such an assumption seems to have been, and seems to continue to be, a kind of empirical correlation of success in public life and the manner of writing or speech. It is true that the great writers and speakers appear to be "correct," although Shakespeare is noted for having used, "...between you and me..."; Jonson for substituting who for whom; Ruskin, Chesterfield, and even Churchill for using singular verbs with plural subjects and vice versa; a host of both old and modern writers for dangling modifiers in front of

the eyes of the beholder; more for using this without a sufficient antecedent; and so forth and so forth.

Yet literally every major publisher in this country promotes a handbook of grammar and other aspects of good writing, in some cases more than one such handbook. The vast majority of such books over the past twenty-five years have been based on the prescriptive grammar of the eighteenth and nineteenth centuries, a grammar which is quite obviously taken from that of classical Latin. Lloyd and Warfel (1956) give an excellent and brief description of the changes in English from 400 to 1550 showing how much the language has depended upon a Latinate grammar even though the lexicon is made up of borrowings from a number of languages, including Anglo-Saxon and Latin. Gorrell and Laird (1953), on the other hand, reveal the nature of such books in the following excerpts:

> " (2) Good writing -- as manifested in word choice, in sentence structure, and in the broader aspect of composition -- must be based on clear thinking.
>
> " (3) A mastering of writing can be acquired most quickly and thoroughly through improvement rather than correction; so-called errors disappear only when the writer learns to construct a sentence well.
>
> " (4) ...The student of English derives the greatest benefit from the study of English grammar, not the grammar of another language -- not even that of one as excellent as Latin ..."(Gorrell and Laird, 1953, 1956, p. iii).

In item (2) the editors seem to shy away from the kernel of the problem in making the assumption that "clear thinking" lies at the base of whatever they mean by "good writing." In (3) they enunciate what appears to

be a tautology. And in (4) they appear to err by implying that English grammar is different from Latin grammar.

Among the oldest of the handbooks still in popular use today is Woolley, Scott, and Bracher's College Handbook of Composition. This dates back to the original Woolley edition of 1907. In the preface of the current edition is this sentence: "The purpose of the College Handbook still remains that of providing both students and teacher with a reliable, intelligent, statement of the fundamental principles of American usage" (Woolley, Scott, and Bracher, 1951, p. v). Implied in this statement is the notion that usage is based on some conceptual principles, a notion that modern linguists all decry most vigorously. The fact that the handbook does contain a section, a sizable one, on grammar and syntax is sufficient evidence that the editors believe that grammar is at least one of the factors forming the "fundamental" basis for the teaching of written communication.

Kierzek's Macmillan Handbook of English contains the following: "...it is still a rhetoric and handbook combined..." (p. vii), and "The first part of the book attempts to give the beginner the sort of helpful, common-sense advice about writing that he needs the most when he is a beginner...He is then taken through discussions about grammar as a tool of effective writing..." (p. vii). Again such statements as these quite obviously show a kind of academic carelessness which seems to be traditional in the whole school of prescriptive grammarians. First, one must comment about the reference to "helpful, common-sense advice" which the author promises the student. Such advice is frequently thought of as

being the result of some kind of intuitive knowledge, which may be quite accurate and useful but which in itself shows little evidence of its accuracy and usefulness. Second, one must comment on the references to the "beginner." It is quite apparent upon only casual examination that the book is meant for upper high school and college students. These people are not beginners in any sense of the word. They know their language and its structure and they have known it since they were five years old! Third, one must comment on the phrase "...grammar as a tool of effective writing." This phrase contains, in a sense, the hypothesis for this entire study. Kierzek postulates the grammar is a tool of effective writing. One wonders what Kierzek's definition of effective writing is; one wonders what he means by the concept of tool; one may even wonder what he means by grammar.

It must be added here that the reference to college and high school handbooks of writing does not mean that one should arbitrarily question all that is in them -- far from it. But it is clear that either by implication or by outright postulation, teachers of English have for years taught that "good grammar" is a necessity for "good communication" and have given no evidence for their statements whatsoever. Yet one frequently hears what any teacher of English would call bad grammar and one can observe that the communication resulting therefrom is not always "not-good." It is clear that grammatical error in spoken communication is much more likely to go unnoticed than is grammatical error in written communication. But one also begins to wonder just who is it that does the noticing: teachers of English? editors and other would-be writers? A

postulate to the hypotheses of this study is implied here: communication is not merely the "transfer of information" from the source to the receiver; it can be indexed only in terms of the behavior of the receiver. This behavior is certainly pluralistic and in this study will be identified as having as important components comprehension, attitude, and recognition of "quality."

In an article in College English (May 1951) entitled "Anything Goes," Robert Geist makes a point that needs to be made here. Usage and correctness are rather ambiguous terms and may at times be synonymous and at other times not synonymous. He says:

> It is impossible, of course, to find absolute lines to separate justifiable improvement of sentences and diction, the illusions most of us have about educated speech, and the pedantry of those who would keep eighteenth century rules regardless. As we state our objections to pedantry, we should try to avoid overstatements that invite counterobjections (Geist, 1951, pp. 454-455).

Robert Hall is even a bit stronger in his opinion when he says:

> But to return to our basic point: the message that linguistics has for our society at present is primarily that one we have used as the title of this book: Leave Your Language Alone! We put it this way on purpose, to emphasize that any meddling with our language, by ourselves or others, in the name of "correctness," of spelling, or of nationalism, is harmful. (Hall, 1950, p. 248).

In these quotations is the implication that matters of correctness are ones that need some looking into, not only from the standpoint of

trying to find out what is and what is not correct, but even more importantly in trying to find out how people evaluate things as correct and incorrect and what effect violations of the "rules" or the customs of the language have on the people who are the receivers of the messages. This emphasis on the behavior of the receiver should not be interpreted as meaning that the intent of the source should be ignored. Quite the contrary! But, as will be shown later, the source is a receiver, the receiver a source; and the structure of the language (we are restricting ourselves here primarily to the verbal language) may have important bearing on what behaviors are elicited by both generation of messages and reception of them.

> The background linguistic system (in other words, the grammar) of each language is not merely a reproducing instrument of voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade. Formulation of ideas is not an independent process, strictly rational in the old sense, but is part of a particular grammar and differs, from slightly to greatly, as between different grammars. We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds -- and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do largely because we are parties to an agreement to organize it in this way -- an agreement that holds throughout our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, BUT ITS TERMS ARE ABSOLUTELY OBLIGATORY; we cannot talk at all

> except by subscribing to the organization and classification of data which the agreement decrees. (Whorf, 1956, pp. 212 ff).

The foregoing quotation has been included for two reasons: first to introduce the idea that the grammar of a language is considered by linguists such as Whorf as an element of primary linguistic import, and second to begin to define, for the purpose of this study, what grammar means. It must be stated that Whorf's use of grammar, similar to those of Sapir, Bloomfield, Fries, and the entire modern school of American linguists, is most general. The term is used to indicate the system in which elements of the language go together in an orderly and structured way. Indeed, for Whorf, the term grammar and the term structure may be considered as synonymous. For the purpose of the proposed study, however, it is necessary to operationalize the definition and to justify such operationalization in terms of current usage among modern linguists.

When one proceeds to lower levels of abstraction, it becomes evident that there are some disagreements among linguists, or at best, that there are some areas about which there is no agreement. Gleason, for instance, defines grammar very simply at one point: "Grammar deals with the morphemes and their combinations" (Gleason, 1961, p. 11). Gleason goes on, of course, to define grammar more specifically, but always within the framework of this earliest definition. He indicates that grammar encompasses the study of the relationships between various combinations of morphemes (but he seems to mean simply words here) which have one word common to all the combinations. He includes in his grammar the study of substitutions of one combination for another and he

concludes with this overall statement:

> The fixed order of morphemes in certain constructions and the definable degree of freedom, are basic to language. They are expressions of the systematic structure which is the real essence of speech. It is the business of linguistic science to describe these principles of arrangement in the most comprehensive and concise way possible. Such a description is the grammar of the language. The term is in poor repute with some, largely because of lack of precision in its use, and because it has frequently served as a label for legislation as to how a language should be used, rather than as a description of how it actually is used...grammar will comprehend two convenient, but not precisely delimitable, subdivisions: morphology, the description of the more intimate combinations of morphemes, roughly what are familiarly called "words"; and syntax, the description of larger combinations involving as basic units the combinations described under the morphology of the language. Some linguists use the term morphology to cover both subdivisions, in which case it is equivalent to grammar as used here. (Gleason, 1961, pp. 57-58).

Nelson Francis has suggested a rather useful description of grammar by defining it into grammars 1, 2, and 3. Grammar 1 he defines as "the set of formal patterns in which the words of a language are arranged in order to convey larger meanings." By this he seems to mean the learned patterns that the native speaker "picks up" as he matures from the stage of non-conscious maker of noises to the stage of non-self-conscious communicator and user of the patterns of the language (at about age five and a half). Grammar 2 is defined as "the branch of linguistic science which is concerned with the description, analysis, and formulization of formal language patterns." It has seemed to some that there is not sufficient difference between Francis' grammars 1 and 2 to make a

difference, but it can be shown that the difference does exist and that it is a very significant one. In the first place, it is clear that the five-year-old child does use a set of patterns reliably, over and over again without significant change. It is also clear that within any national language culture any given group of five-year-olds uses the same set of formal patterns -- over and over again without significant change. Beyond this, when the younger-than-five tries to communicate with his older brothers and sisters in the culture and uses the right words and is not successful, his lack of success is attributable to and only to his confusion of patterns or his lack of pattern, at least from the point of view of the listener. But the child does not have much of Grammar 2; he cannot tell us much about the patterns he uses. Grammar 3, as Francis describes it, is something this study is also concerned with, "linguistic etiquette." Francis expressed his thinking rather delightfully:

> The third sense in which people use the word "grammar" is "linguistic etiquette." This we may call "Grammar 3." The word in this sense is often coupled with a derogatory adjective: we say that the expression "he ain't here" is "bad grammar." What we mean is that such an expression is bad linguistic manners in certain circles. From the point of view of "Grammar 1" it is faultless; it conforms just as completely to the structural patterns of English as does "he isn't here." The trouble with it is like the trouble with Prince Hal in Shakespeare's play -- it is "bad," not in itself, but in the company it keeps. (Francis, 1954, pp. 299-300).

Fries (1952, p. 56) says, "...the grammar of a language consists of the devices that signal structural meanings..." and goes on to indicate that such structural meanings are those which are conveyed by

patterns of arrangement (grammar?) and the selection of form classes (parts of speech?), as contrasted with lexical meanings, the meanings of the forms themselves. (This latter meaning, of course, is what Morris (1958) says is the result of "semantic rules" of the language as opposed to "syntactic rules.")

In this study, however, grammar will mean that formal pattern or set of patterns of discourse used by the majority, in fact by all, of the people in the culture. Deviations or departures from "correct" grammar will be defined in the design section of this study in some detail, of course, but for the present it should suffice to state that what is considered correct in this study will be that pattern or set of patterns which is common to all formal written public discourse.

Now to a lower level of abstraction and generalization, a survey by this writer of some thirty-two current handbooks of composition and grammar (see Appendix B for the list) reveals what may be significant agreement among the editors of what constitutes grammar at this level. The rules which were labeled under the rubric grammar include, generally, the following:

parts of speech
pronoun form (case and agreement)
verb form (tense, mood, principal parts)
subject-verb agreement
adjective-adverb form
conjunctions (coordinating and subordinating)

The last category was the least common of this list, and was included in

a number of the handbooks under the rubic of word choice. The agreement among teachers of English in this country on what constitutes grammar is almost amazing when viewed in juxtaposition to the disagreements among the same teachers of English as to what constitutes the rest of the discipline called composition instruction.

Kitzhaber's Dartmouth study (1963) tends to sum up the state of the art at this point so well that it seems needless to go into the justification of selection of these "rules" of the language any further. In this study a fairly careful examination of the writing of college students was carried out to determine whether instruction in grammar and writing had any measurable and significant effects on the writing of college students. The report states that although some effect was noted between the freshman and sophomore years, by the end of the senior year the students were actually writing with more errors than they had when they were freshmen. Some of the descriptive statistical data in the Kitzhaber study may be taken as authoritative and useful. Studies were made of freshman writing, with the "errors" categorized into nine groups, one of which was labeled grammar. This group contained the following kinds of errors:

1. Nouns: error in number
2. Nouns: error in case
3. Pronouns: error in case
4. Verbs: error in principal part
5. Verbs: error in tense
6. Verbs: error in mood
7. Incorrect use of adverb or adverbial element
8. Incorrect use of adjective or adjectival element
9. Error in agreement: subject - verb
10. Error in agreement: pronoun - antecedent

(Kitzhaber, 1963, p. 44).

Kitzhaber's report does not, unfortunately, further operationalize these terms.

The next theoretical question to be posed is that of hypothesizing from the current state of knowledge about our language what effects should be expected from what we are calling mistakes in grammar. Trager and Smith (1957) make it very clear that the lexical item we call a word may "carry" part of the message, that the inflectional affixes may carry part of the message, that the phonemic suprasegmentals carry part of the message, that the combinations and orderings (syntax and grammar) carry part of the message, and that the suprasegmental phrase morphemes carry part of the message. In fact, the Smith-Trager theory is that all of the above parts of the message are necessary to the "carrying" efficiency of the communication process.

Miller (1951, p. 106), in discussing redundancy, says, "In one form or another, every language, if it is to be reliable, must be redundant. There is no other way to catch mistakes. Thus the time spent redundantly is not wasted, for it serves to make the language a dependable channel for communication." He goes on to indicate that there are three kinds of rules of language use which are easily distinguishable by the student of language: semantic rules, syntactic rules, and pragmatic rules. Miller appears to suggest that a mistake in the use of one kind of rule may be overcome by the redundancy existing in the use of the other kinds of rules. What he seems to ignore is that there are built-in redundancies in each category of rules as he delineates them. But when he says (p. 103), "Redundancy has its advantages, and a large degree of

interdependence among the successive units of a language means that parts of the message can be lost or distorted [incorrect grammar?], without causing a disruption of communication," it appears that he is taking into account the built-in redundancies at each level.

Lloyd and Warfel (1956, p. 324) say, "These three ranks of signals [phonemes, morphemes, and syntactic patterns] strike the ear all at once as a single impression within a large number of variations in the stream of sound that we do not hear because we know they do not count; they have no relevance to the meaning." Later they say (p. 328), "With it [phonemic notation used as a tool for observation] we expose the repetitions and regularities by which we communicate; we break the barriers of sound and penetrate to some extent the mystery." What is of interest here is that the redundancies, to use Miller's term, built in to the three "ranks" are such that they work together to the extent that we are not normally aware of them and so that they "cover" the "noise" that may exist in the system. It may seem to be a pertinent question to ask what Lloyd and Warfel mean by the term repetitions in this context, but it should be clear that they are not speaking of the kind of redundant repetition that we think of as so necessary in spoken language. They are talking here of the regularities of patterns of phonemes, morphemes, and syntactic constructions, which regularities suggest to us that language is a system with describable patterns.

Hockett in discussing the design of a language (Hockett, 1956, p. 301) says, "A language is a complex system of <u>habits</u>." The italics are his. Here we can suggest a new note in the description of how

language operates which may indicate another way in which our responses to language utterances, rather than our generation of linguistic sounds, have important bearing on this study. If, as Smith says, we "know" the grammar of our language by the time we enter elementary school, we may posit that we have acquired a good many, almost the necessary number of linguistic habits. If we have acquired these habits so thoroughly, then when we encounter an "error" in linguistic usage, we will tend to "cover" for it, to get closure, to perceive the stimulus, the message, as a correct and complete message. Just as the many studies in gestalt psychology of visual perception have shown that the human organism seeks after closure in any complex stimulus situation, so it should be true that in a linguistic situation the organism will seek closure. Taylor's cloze procedure (1954) is posited on this same basis, and where Taylor has used cloze procedure as a measure of the difficulty of reading in a written message, the subject is forced to "cloze" the gap in the mutilated message. Taylor, in fact, defines the subject's responses as the reproduction of the source's linguistic habits in the mind of the receiver. Hockett makes it very clear that linguistic habits have a place in the brain when he says, "...but what he does deduce or learn from these observations is abstracted from the speech and the situations, and established as a set of patterns, in the brain of the child, in the brain and notebooks of the analyst" (Hockett 1956, p. 302).

Even Jesperson (1921), as incomplete and in some cases erroneous as he has been shown to be, was cognizant of the habit formation process in the child.

> To learn a language it is not enough to know so many words. They must be connected according to the particular laws of the particular language. ...At first each word has only one form for the child, but he soon discovers that grown-up people use many forms which resemble one another in different connexions [sic], and he gets a sense of the purport of these forms, so as to be able to imitate them himself or even develop similar forms of his own.
>
> The countless grammatical mistakes made by a child in its early years are a tell-tale proof of the difficulty which this side of language [grammar] presents to him -- especially, of course, on account of the unsystematic character of our flexions and the irregularity of its so-called 'rules' of syntax.
>
> (Jesperson, 1921, p. 128).

This latter paragraph reveals a point of view no longer thought to be true. Brown and Fraser (1963) have shown that (1) children do have construction rules, (2) that they do more than just memorize patterns, that they must somehow assimilate the patterns and then apply them in new situations, and (3) that child speech is a systematic reduction of adult speech "largely accomplished by omitting function words that carry little information." Church (1961) also shows that the child has the rules of his language at a very early age: "The composing of statements points to the fact that in learning language the child does not merely acquire a stock of words. As Brown and Berko [1960]and Ervin [1957] have pointed out, the child also learns what adults know as the 'rules' of grammar and syntax -- rules of flexion for tense and mood and number (and, with pronouns, gender and case), of word order, and eventually, of constructing compound and complex sentences." None of the above mentioned investigators tries to indicate that the child's language is without error, but

Church points out better than most how the child's errors do occur. "When adults skilled in stenography, including those with considerable experience with children, are asked to record verbatim the speech output of a preschool child, their records, compared to one carefully transcribed from a tape-recording, are, in fact, reconstructions in adult English. The child's actual verbalizations are fraught with gaps, hesitations, elisions, strange inversions of word order, repetitions, false starts, and irrelevancies that appear from nowhere, often completely changing the sense of what the child is trying to say. Much adult speech, of course, shows the same features, if one is alert to note them" (Church, 1961, p. 271). It hardly needs to be pointed out that Church's findings do not include errors specifically identified as grammatical.

If these findings are to be believed, and it is not suggested here that there is any reason to doubt them, one must assume that the habits of language are well ingrained, that the intervening variable of habit strength is strong. The habits then become generalized to the extent that they permit closure over gaps and over so-called errors in grammar. From such a deduction, then, we must conclude that errors in grammar do not necessarily interfere with the comprehension of written messages, at least when we consider errors in grammar to the extent, even, of the Kitzhaber example quoted earlier. From the theories of learning one may add another factor to support this conclusion. If the closures over errors in grammar accomplish what may be in effect the correction of the error, the resulting comprehension of the message, even within rather small sequences of discourse (a matter, say of three or four words) may

act as reinforcement, and may react to the time gradient, which in this case would be very short, with the result that the reinforcement becomes a significant kind of reward in the decoding process.

Hypotheses

This study is an elemental investigation of the effects of errors in grammar on communication. Several hypotheses have been tested, with several different criterion measures being used to determine what effect(s), if any, errors in grammar make. These criteria are assessment of writing quality, attitude toward the message, and comprehension of the message. The specific hypotheses are listed below.

1. In samples of written English text, incidence of grammatical error will result in the subjects indicating that the text is "badly written." In other words, whether attitude and/or comprehension is affected or not, the subjects will show that they are aware somehow of differences in the degree of grammatical error, without their being required to specify kind or amount of error.

2. In the same samples of written English text, the greater the degree of grammatical error the greater the differences in the subjects' attitudes toward the message.

3. In the same samples, increasing incidence of grammatical error will not result in significant differences in immediate comprehension of the material in the text.

4. Differences in verbal aptitude in the subjects will reflect significant differences in the subjects' ratings of the text as "well written" or "badly written." Subjects above the marginal verbal aptitude level will show significantly more recognition of the incidence of grammatical error than subjects at and below the marginal level of verbal aptitude.

In the attitudinal measure, differences in verbal aptitude levels of the subjects will not show a significant effect. Subjects with marginal or lower aptitude ratings will not score significantly lower than those with verbal aptitude ratings above the marginal value.

In the comprehension measures, subjects with high verbal aptitudes will respond similarly to those with low verbal aptitudes. That is, subjects who have verbal aptitude ratings normally thought of as being marginal or below will not show significant differences in comprehension from those subjects whose verbal aptitudes are above marginal.

The following section will discuss the hypotheses in detail, giving appropriate operational definitions for each and indicating the dependent variable criterion for each hypothesis.

1. Recognition of Writing Quality: For the purposes of this study writing quality is defined as the response made by the subjects. The subjects will be asked to indicate whether they think the text sample is "well written" or "badly written." Since writing quality is a very complex concept and since college students do not give evidence that they know how to explain writing quality, the criterion test for this portion of the investigation will be a closed-end, two-alternative, single-item test.

The English Composition test of the College Entrance Examinations Board is designed to reveal the level of knowledge, conscious knowledge, the student has of his language; part of the examination is in the formal grammar of English. Subjects taking part in this investigation have a median score on this examination of 552, well above the national mean (theoretically 500). This last comment is included to make sure that it is clear that, by and large, those taking this achievement examination consider themselves (or perhaps are so considered by their parents) to be at or near college entrance levels. According to Dieterich (1961) this tends to eliminate those who might score lower than 250 on this test and tends also to skew the scores toward the high end. These data mean, of course, that when we say that the subjects for the current study have a median test score of 552 that they are considerably higher than the "average" high school senior in this country. Such a level of conscious knowledge of the structure of the language, then, makes tenable the hypothesis that even though errors in grammar do not seem to affect comprehension of the material in the message, there is recognition of the existance of errors therein, a recognition which permits the subject to announce his opinion as to the quality of the writing as indexed by his perception of incidence of grammatical error.

A preliminary investigation of the material to be used for the text sample in this study showed that a small sample (n = 29) of college freshmen evaluated the text as "pretty well written." This was the desired goal in choosing the text since the hypothesis requires that room be left at the negative end of the control group's assessment rather than

at both ends or at the positive end so that the increase in grammatical error may be reflected, if the hypothesis is supported, in the assessments by the experimental groups.

2. Effect on Attitude: Attitude will be measured in this study by use of a semantic differential. It has been hypothesized that as the degree of grammatical error increases, the attitude of the subjects toward the writing will change. Semantic differentials have been used so thoroughly and so many times as attitude measuring instruments that the instrument hardly needs justification here. However, it may be useful to report very briefly on its justification. Osgood, et al., (1958, p. 189) says, first, "One of the significant by-products of our work in experimental semantics, we believe, has been a new approach and rationale for attitude measurement." These investigators agree with most attitude authorities that attitude is an intervening variable, that it mediates behavior between the perception of the stimulus and the overt response to that stimulus (some indicate also that attitude mediates the very perception of the external stimulus), and that attitude is a predisposition to respond in a certain way. Further, Osgood posits that attitude is different from other mediating variables that predispose the organism to respond in a certain way and adds, "...that they predispose toward an evaluative response" (p. 189). His italics. Throughout the entire area of attitude research there is an assumption that agrees with Osgood's: that attitudes have direction, for and against, toward and away, favorable and unfavorable. This assumption implies then that such predispositions are what Osgood calls "bipolar" and that the distance between the

poles constitutes a continuum. Another assumption is that this continuum reflects the "intensity" of the attitude (Osgood), the "degree" of the attitude (Doob), that attitude has at least two dimensions of direction and strength. Finally Osgood, et al., indicate their rationale for identifying part of their semantic meaning, or semantic space, as attitudinal as follows.

> If attitude is, indeed, some portion of the internal mediational activity, it is, by inference from our theoretical model, part of the semantic structure of an individual, and may be correspondingly indexed. The factor analyses of meaning may then provide a basis for extracting this attitudinal component of meaning.
>
> In all of the factor analyses we have done to date...a factor readily identifiable as evaluative in nature has invariably appeared; usually it has been the dominant factor... It seems reasonable to identify attitude, as it is ordinarily conceived in both lay and scientific language, with the evaluative dimension of the total semantic space, as this is isolated in the factorization of meaningful judgments.
>
> In terms of the operations of measurement with the semantic differential, we have defined the meaning of a concept as its allocation to a point in the multidimensional semantic space. We then define attitude toward a concept as the projection of this point onto the evaluative dimension of that space. Obviously every point in semantic space has an evaluative component ...and, therefore, every concept [my italics] must involve an attitudinal component as part of its total meaning. (Osgood, et al., 1958, pp. 190-91).

The more specific justifications for the semantic differential, in terms of correlations with other measures of attitude, are given fully in the Osgood reference made earlier. It should be sufficient to indicate

that the semantic differential has correlated highly and positively with a number of Thurstone scales, with Guttman scales, with Remmers' scales and with a modified Bogardus Social Distance Scale.

An immediate problem concerning the measurement of attitude has been presented in this study: if we use the semantic differential, what concept is being measured? It was originally hypothesized that attitude would be measured about the "material" of the text used as experimental samples. It was further hypothesized that attitude toward the source of the message would also be measured. In pilot studies, however, it was found that definition of the "material" of the text was unsatisfactory in terms of the subject's response. In a small sample ($n = 32$) of the same type of subjects as those to be used in the main study, there was almost no agreement among the subjects as to a listing of "material" contained in the text. The second assumption, about the source of the message, was discarded since arbitrary and false declarations of sources had a significant effect on the apparent attitude of the subject toward the source. Source credibility could be designed into this current study, but this variable will make an appropriate subject for future study since it is one of considerable complexity.

It was decided, therefore, to limit the concept of the attitude measurement to that suggested by the title of the text sample. Again the pilot study mentioned showed that the responses to the title remained constant enough over a two-week period (the test-retest coefficient was .88).

3. Effect on Comprehension: In this study comprehension will be

measured by Taylor's "Cloze Procedure" (Taylor, 1954). Taylor (p. 3) defines cloze procedure by indicating that cloze scores show "...the degree of correspondence between the language habits used by the source while 'encoding' the message (fitting sequences of language symbols to the meaning) and the language habits used by the receiver while 'decoding' it (fitting meaning to the mutilated message) and, on the basis of the meaning perceived, attempting to encode those elements that will make the message's form whole again." The theoretic basis for cloze procedure is gestalt psychology of perception which posits that a subject will perceive a broken "circle" of stimuli as a completed or unbroken "circle," given that other things are maintained constant. This means, in the context of verbal communication and of cloze procedure, that a subject receiving a sequence of verbal stimuli, a sequence which is structured such that it forms a "circle," that is, a completed structure, will perceive that structure as a complete one even if it is broken by having elements actually missing from it. Koffa (1924, p. 322) says, "So long as activity is incomplete, every new situation created by it is still to the animal a transitional situation; whereas when the animal has attained his goal, he has arrived at a situation which is to him an end-situation." Hilgard (1956) comments on this by indicating that since closed spaces are more stable than open ones and since such closed spaces are perceived more readily as formed figures, the direction of behavior in the animal is toward an end-situation which brings closure with it. Hilgard adds what appears to be a simple statement, but one which is profound for the purposes of this study: "It is in this manner that rewards influence learning" (p. 105). Katona (1940) has shown that the pattern of word

responses corresponds to the prior experiences of the subject so that he supplies either an individual trace (a particular word, for instance) or a structural trace (a particular part of speech or a particular idiomatic phrase). He further reports that structural traces are more likely to occur than the individual traces in any given situation. It seems obvious that Katona would agree that what has been defined herein as grammar includes what he calls structure. Although there is still some question generally as to the size of the vocabulary items in one's repertory it far exceeds the number of structural combinations used in English (or in any other language, for that matter). Therefore, it seems apparent that it is possible and even practical to posit that in such a test as Taylor's a subject can very well duplicate the structure of the original message precisely. It is on this basis that cloze procedure is used as a measure of comprehension not only for the control message (the message with no grammatical errors) but also for the experimental messages (those with varying degrees of grammatical error). The intent of the hypothesis here is to determine to what extent the subject can reproduce the original, unmutilated message, not to determine to what extent the subject can reproduce the mutilated message itself.

Taylor has defined cloze scores in terms of the "language habits" of both the encoder and the decoder. Skinner (1953) and Keller and Schoenfeld (1950) have shown that the basic units of verbal communication, speech sounds, are emitted and reinforced just as any other units of behavior are. Accordingly, speech behavior can be explained in terms of the ordinary principles of operant conditioning, and so may "reading"

behavior. If we apply the Hullian S-R theory of learning, we can posit Hull's $_sH_r$ (generalized habit strength from related habit) as the intervening variable that may account for the trace tendency of a structural nature. One may assume, then, that the elicitation of verbal responses in Taylor's cloze procedure is in complete agreement with both a simple S-R theory and also a mediation theory.

More specifically, Taylor has defended cloze procedure by establishing high positive correlations between cloze scores and other measures. In before-after learning experiments, cloze scores were obtained along with comprehension scores from independently validated multiple choice test and AFQT intelligence scores. Cloze correlated with the before comprehension test .70 and with the after .88. Comprehension scores correlated with AFQT .65 and .70, while cloze and AFQT correlated .73 and .74. These correlations were significant at the .01 level. From these data Taylor concluded that "...cloze scores, then, may be an index of learning, comprehension, intelligence, or message difficulty, and it is a matter of control that determines what they index in a particular situation."

4. Effects of Verbal Aptitude on Quality Ratings of the Writing: It is hypothesized that differences in verbal aptitude reflect significant differences in the subjects' ratings of the writing as "well" written and/or "badly" written. The subjects were asked to evaluate the messages in a single-item, two-alternative, closed-end question. The hypothesis says that (1) among the subjects rated as "high" verbal aptitude, there will be significant differences among all the treatment

groups, but that among the subjects rated as "low" verbal aptitude, there will be no significant differences among the treatment groups. It is not hypothesized, however, that there will be significant differences between the "high" and "low" groups for each treatment, although it might be thought that there will be significant difference between the "high" and "low" groups for the most extreme degree of grammatical error. The justification for this hypotheses does not, unfortunately, lie in the theory built from prior empirical research. Instead, it lies with the kind of intuitive assumptions made by teachers of English, at all levels, for many, many years.

5. Effect of Verbal Aptitude on Attitude: It has been hypothesized that the effects of grammatical error will be affected by the differences in verbal aptitude as defined earlier. But it is not intended that this hypothesis include differences in attitude responses between groups defined as "high verbal aptitude" and "low verbal aptitude." As indicated earlier, "low" is defined as below 500, high as 500 and above. The justification for this hypothesis is given in a study by Chotlos (1958), which shows that attitude ratings of written samples of English do not correlate highly with intelligence test scores. Since, in general, intelligence measures do correlate positively with verbal ability scores, the assumption underlying this hypothesis is again supported.

6. Effect of Verbal Aptitude on Comprehension: Within the limits of this investigation, it is hypothesized that the kinds of differences found in college students on the dimension we call verbal aptitude will make no difference in comprehension as it is affected by varying degrees

of grammatical error. Verbal aptitude scores are considered by college admissions people (Morse, 1963) as a significant factor in the prediction of collegiate success. And yet no one has identified in any way the correlation between verbal aptitude scores and reading ability. There have been a number of studies which attempted to correlate verbal aptitude scores with I.Q. scores, and these, in general, have revealed positive and moderately high correlation coefficients. However, the application of such findings to the decoding process has been nil. If the "theories" of the linguists are to be believed, such measures of verbal aptitude must measure the ability of the subject to "re-enclode" his knowledge about his language, rather than measuring his "knowing his language." The logic here is that the "ingraining" of linguistic habits results in the non-conscious ability to overcome errors in the language during a decoding process, but does not necessarily permit the subject to "talk about" such errors. If this deduction is valid, then one must hypothesize that even such measures as verbal aptitude scores will not reflect differential abilities to decode messages which have errors in grammar.

CHAPTER II

METHOD

Subjects: Three hundred and fifty male Ss were used in this study. The Ss were selected from freshman classes of Rensselaer Polytechnic Institute and were assigned randomly to this study while being given alternative exercise work to hide, temporarily, the fact of an experiment. A single lecture situation encompassing some 350 students was available for this experiment, these students being majors in engineering, science, architecture, and the social sciences. There is no evidence that this group reflects any special distribution of intelligence (except, of course, as being members of this particular freshman class suggests that they are typical of good college students), nor does it suggest any peculiarities of time of day (the class met at 11:00 a.m.), interest or disinterest in verbal communication, willingness or reluctance to be part of an experiment. It should be noted that the Ss, by and large, come from one area of the United States, mostly from the states of New York, New Jersey, and Pennsylvania; that they come, by and large, from the upper-middle and lower-upper socio-economic strata of American society; and that they tend to reflect higher mathematical aptitudes than verbal aptitudes.

Design: The original intent of this study was to determine the effects of grammatical error on the two dependent variables of attitude and comprehension. But it appeared necessary to investigate also the ability of Ss to perceive the differential qualities of the written material, since without such an investigation the assignment of differ-

ences in attitude and comprehension, if they did occur, to the differences in degree of grammatical error would be only speculation. Therefore it was necessary to design the study in three parts: first, the investigation of the differential perceptions of writing quality (the first dependent variable) caused by different degrees of grammatical error (the independent variable); next the investigation of attitude differences (another dependent variable) due to the different degrees of grammatical error; and third, the investigation of the effects on comprehension (the third dependent variable) caused by grammatical error.

The first part of the study was designed so that the dependent variable, perception of writing quality, was indexed by the number of Ss responding with "well-written" and "badly-written." The first hypothesis predicted that the numbers of Ss responding "well-written" would vary with the degree of grammatical error. A later hypothesis predicted that the numbers of Ss responding to each degree would be different not only because of the differences in grammatical error but also because of the differences in level of verbal aptitude. It was necessary therefore to obtain frequency counts of those responding in terms of their respective positions on the verbal aptitude dimension, as well as in terms of the different degrees of grammatical error.

For these purposes it was apparent that a chi square analysis was appropriate. Figure 1 below shows the model of the perception of writing quality part of the study.

Figure 1

Two-Fold Chi Square Analysis

Dependent Variables	Treatments: Degrees of Grammatical Error					
Well Written	0	1	2	3	4	X^2
Total						
High VA						
Low VA						
High-Low X^2						
Badly Written						
Total						
High VA						
Low VA						
High-Low X^2						

In Figure 1 above, X^2's are calculated for the treatments for all the dependent variables: well-written high VA, well-written low VA, and well-written total; also for badly-written high VA, badly-written low VA, and badly-written total. Chi squares are calculated also for the high-low comparisons of each treatment for both well-written and badly-written. This will give an analysis of 24 chi squares, shown later in this paper under Results.

To investigate the effects, if any, of grammatical error on attitude and comprehension, the second and third dependent variables, the study was designed so that Ss were given a semantic differential attitude test and a cloze procedure comprehension test, the scores on each being the index of their attitudes and comprehensions. The design allowed the Ss to respond to the various versions of the text immediately following their reading of the control or experimental versions, so that in effect

the two tests, one of attitude and one of comprehension, were separate. To take into account any interaction between the two tests, the administration of them was counterbalanced.

Since the data from the two tests permits analysis of variance, the analysis was made a two-part factorial design. The two dependent variables were attitude and comprehension, with verbal aptitude used as an additional independent variable. The first analysis was of main treatments, that is, of the effects of degrees of grammatical error. The analysis was designed so that there were actually two separate analyses, one for attitude and one for comprehension. The second level of analysis is along the dimensions indicated by verbal aptitude ratings. It has been suggested that since college admission is partly a function of a dichotomous division of such measures (at and above an arbitrary standard score and below that score) that a similar design be used in this study.

Figure 2 below shows the analysis of variance model used.

Figure 2

Two-Part Two-by-Five Factorial Analysis of Variance

Dependent Variables	Treatments: Degrees of Grammatical Error				
	0	1	2	3	4
Comprehension: High VA	n-30	30	30	30	30
Comprehension: Low VA	30	30	30	30	30
Attitude: High VA	30	30	30	30	30
Attitude: Low VA	30	30	30	30	30

Procedure: The procedure was to present to the Ss samples of English written discourse which was prepared in five versions: one with no grammatical errors and four with increasing degrees of grammatical error. As indicated earlier one of the problems to be solved before beginning was to select text which college students could read and comprehend without undue difficulty and which would be of such a substantive nature that it would fit into the experimental situation without the Ss feeling that the material was in any way outside their normal academic range of interest. Some eight different selections were tried out in the experimentor's own classes and from a simple rating system and informal discussion one was selected as meeting these requirements. Samples of all the versions actually used are included in the Appendix A.

The next problem to be solved was that of inducing into the text grammatical error which was realistic and again "non-suspicious." A panel of five English-teacher colleagues was asked to evaluate each of the versions by circling grammatical errors they found in the text without prior knowledge of what the text was to be used for. Wherever there was significant difference among members of the panel about a particular error, that error was eliminated from the text. There was surprising agreement among members of the panel as to what constituted error in the given versions, and only six errors had to be eliminated.

To make the errors appear "realistic," a survey of remedial student writing done over the past five years was made and showed that the errors used in the study occurred according to the following list, the number opposite each kind of error giving its incidence per 1000 words.

subject-verb agreement:	3.6
case of pronouns:	2.5
pronoun-antecedent agreement:	1.6
mood of verb:	1.2
tense of verb:	1.1
principal parts of verb:	0.9
adverbial element:	0.8
adjectival element:	0.6
number of noun:	0.2
case of noun:	0.0

These figures differ, of course, from those reported by Kitzhaber (1963, p. 46), but this is due, apparently, to the current survey being taken from writing done in a remedial writing course. On the basis of these frequencies, the text versions were prepared, the "0" degree version having no errors, the "1" degree version having approximately the distribution of errors indicated in the list above, the "2" degree version having twice as many as the "1" version with the same proportions, the "3" version having three times as many as "1," and the "4" version having four times as many. It was necessary to check to see that the various versions not only had different numbers of errors but that the panel would recognize the differences. The panel's response to being asked to rate the versions as to their grammatical "quality" is given below.

Figure 3

Rankings of the Panel on Five Test Versions

Versions	Panel Members				
	A	B	C	D	E
0 Degree	1	1	2	1	1
1 Degree	2	3	1	2	2
2 Degree	3	2	3	4	3
3 Degree	4	4	4	3	4
4 Degree	5	5	5	5	5

The Kendall Concordance Coefficient (W) showed that the association among these rankings was significant at the .01 level (observed $s = 222$, $W = 0.88$). Therefore it was assumed that the five versions were significantly different, not only in the number and distribution of grammatical errors they contain, but also in the effect they had on the panel of English teachers.

With the test messages so constructed, booklets were prepared, containing complete written instructions to the Ss for the task to be performed. The order of the cloze procedure test and the semantic differential test was counterbalanced. The question asked for evaluation of the "quality" of the writing was held constant as the last part of the test. (Copies of the test booklets are included in the Appendix A.) The booklets were coded for version identification and were ordered randomly so that the classroom instructor could distribute them without inconvenience and without having to make any lengthy announcements. The

investigator was not present during the actual testing procedure, but a colleague was present to observe the administration. He did not know any details of the experiment and was requested not to entertain any questions from the Ss or from the classroom instructor.

Scoring of the tests was conducted immediately following the test session and any booklets which were not completed were eliminated from the study. Since the class used numbered some 350 and only 300 Ss were needed for the investigation, absences on the day of the test and incompleted booklets did not offer any problem. Actually some 324 students were present, but only 309 booklets were complete enough to be used. The extra booklets were eliminated by random selection from the appropriate versions.

In the semantic differential attitude test the following scales were used for actual scoring:

good - bad (evaluative factor loading: .88)

valuable - worthless (.79)

pleasant - unpleasant (.82)

fair - unfair (.83)

honest - dishonest (.85)

Masking scales used were weak-strong (.19), passive-active (.14), large-small (.06), clear-hazy (.59), and rough-smooth (-.46). These were taken from Osgood, et al., 1958, p. 37. All the scales were arranged randomly, both in sequential order and in right-left positioning of the scale adjectives.

CHAPTER III

RESULTS

The results of the experiments are presented in two parts: first as the statistical analyses and second as a series of statements indicating the support or non-support of the various hypotheses.

Tables 1 through 3 give the results of the chi square analyses.

Table 1

Chi Squares -- Well-written Responses

Variables	Treatment Frequencies					X^2	df
	0	1	2	3	4		
High VA	20	17	18	10	6	) 9.8*	4
						)- 9.6*	4
Low VA	4	3	4	7	3	) 2.6	
X^2	16.0**	9.8*	14.7**	0	1.0		
df	1	1	1	1	1		

* p .05
** p .01

Table 1 shows, first, that among all Ss who responded with well-written to all five versions of the text there is a significant difference between high verbal aptitude Ss and those of low verbal aptitude. It also is demonstrated that for those versions of the text with no or little degree of grammatical error (treatment versions 0, 1, and 2) significantly higher numbers of Ss of high verbal aptitude rated the text as "well-written" than Ss of low verbal aptitude. It is also demonstrated that there is a significant difference among the frequencies of the five versions at the high VA level, but not among the low VA frequencies. Apparently,

then, even among those Ss who perceived all the versions as well written the number or frequencies pertaining to each version indicate significance of difference among the versions.

Table 2

Chi Squares -- Badly-written Responses

Variables	Treatment Frequencies 0	1	2	3	4	X^2	df
High VA	1	2	4	8	17)	26.4**	4
					)-	14.2**	4
Low VA	5	8	4	5	4)	2.0	4
X^2	-	3.6*	0.0	0.7	8.0*		
df	1	1	1	1	1		

* p .05
** p .01

Table 2 tends to show much the same results as Table 1, except for the expected difference in direction. Significant difference between high and low verbal aptitudes is again demonstrated. It can be seen also that at the high VA level the frequencies increase as the degree of grammatical error increases and that the differences among high VA frequencies are significant, although there is no significant difference demonstrated among low VA frequencies.

Table 3, which follows, gives the results of the analysis of the responses when verbal aptitude levels are not taken into account.

Table 3

Chi Squares -- Totals

Variables	Treatment Frequencies 0	1	2	3	4	X^2	df
Well-written	24	20	22	17	9)	7.5*	4
					)-	19.4**	4
Badly-written	6	10	8	13	21)	11.8*	4
X^2	10.8*	3.3	6.5*	0.5	4.8*		
df	1	1	1	1	1		

* p .05
** p .01

Table 3 show the analysis of totals of frequencies of two groups of Ss, those responding with "well written" and those responding with "badly written." It is demonstrated that among those responding with "well written" there is a significant difference and in the direction hypothesized, and the same is true for those Ss responding with "badly written." And the difference between the "well written" frequencies and the "badly written" frequencies is also significant. However, it must be pointed out that the pattern of significant differences among the treatment pairs (well and badly written) is not at all clear. One would expect significant differences at each end, which expectation is supported, but one would not expect significant difference in the middle, such a difference being demonstrated for treatment version 2.

The results shown in Tables 1, 2, and 3 demonstrate general support for the original hypothesis: that incidence of grammatical

error will be perceived and indexed by the response of "badly written" and that there will be some differnce in the responses according to the verbal aptitude levels of the Ss.

Table 4 below shows the analyses of the scores obtained from the attitude tests.

Table 4

Analysis of Variance -- Attitude

Sources of Variation	d.f.	Sums of Squares	Mean Squares	F
Between A	4	3430.63	857.66	110.38**
Between B	1	2.93	2.93	0.37
(cells)	(4)			
Inter. AxB	4	181.71	45.43	5.83*
Within	295	2296.62	7.78	
Total	299	5911.95		

* p .05
** p .01

Table 4 shows the analysis of variance for the scores taken from the attitude test and shows support for the original hypothesis that attitude is affected by grammatical error. It also demonstrates the possibility that levels of verbal aptitude are not affective differentially within this hypothesis. The significant interaction result, however, is an interesting addition to the expected results and will be commented on further after the results of the Duncan

Multiple Range Test are available.

Table 5 gives the results of the analysis of the comprehension scores.

Table 5

Analysis of Variance -- Comprehension

Sources of Variation	d.f.	Sums of Squares	Mean Squares	F
Between A	4	5.06	1.26	0.13
Between B	1	36.77	36.77	3.83
(cells)	(4)	58.45		
Inter. AxB	4	16.62	4.15	0.43
Within	295	2829.05	9.59	
Total	299	2442.04		

Table 5 does not show any significant differences among treatments, among levels, or of interaction between treatments and levels. These results support the original hypothesis.

Homogeneity of variance was checked on the attitude analysis only, since the comprehension analysis did not show any significant differences. The minimax test was used and resulted in an F of 10.37; the $F_{.95}$ for the appropriate degrees of freedom (4, 29) was 19 plus. Therefore it is assumed that no effective heterogeneity of variance was present.

Since a significant F was obtained in the attitude study and since the variances appear homogeneous, it now becomes appropriate to determine

where among the treatment means the differences lie. The Duncan Multiple Range Test was used for this purpose and its data are presented in Tables 6 and 7 below.

Table 6

Duncan Multiple Range Test
Attitude -- High Verbal Aptitude

Ordered Means	Ts	T_0	T_1	T_2	T_3	T_4	R
27.46	T_0	0	0.76	1.16	6.73	8.13	.586
26.70	T_1		0	0.40	5.97	7.37	.611
26.30	T_2			0	5.57	6.97	.628
20.73	T_3				0	1.40	.640

Protection level = .96

Table 7

Duncan Multiple Range Test
Attitude -- Low Verbal Aptitude

Ordered Means	Ts	T_0	T_1	T_2	T_3	T_4	R
27.16	T_0	0	0.33	3.36	4.10	7.13	.586
26.83	T_1		0	3.03	3.77	6.80	.611
23.80	T_2			0	0.74	3.77	.628
23.06	T_3				0	3.03	.640

Protection level = .96

From Table 6 it can be seen that the following differences appear aignificant:

Between treatments 0 and 1, 2, 3, and 4;

Between treatments 1 and 3 and 4;

Between treatments 2 and 3 and 4;

Between treatments 3 and 4.

No difference appears to exist between treatments 1 and 2.

From Table 7 it can be seen that the following differences appear significant:

Between treatments 0 and 2, 3, and 4;

Between treatments 1 and 2, 3, and 4;

Between treatments 2 and 3 and 4;

Between treatments 3 and 4.

No difference appears to exist between treatments 0 and 1.

The significant interaction demonstrated in Table 4 suggests that although there appears to be no significant difference in the attitudinal responses of the Ss according to their respective verbal aptitude levels throughout the treatments, there may be some significant difference(s) between levels in some of the treatments. Table 8 below shows the means for all cells and may reveal wherein such differences lie.

Table 8

Means*-- Attitude

	Treatments				
Levels	T_0	T_1	T_2	T_3	T_4
HVA	27.56	26.70	26.30	20.73	19.33
LVA	27.16	26.83	23.80	23.06	20.03

* based on five semantic differential scales as indicated on page 38.

Since the Duncan Multiple Range Test shows, for instance, that the minimum significant difference among all the means is 0.586 and that the maximum is 0.640 and since the difference between HVA-T_3 and LVA-T_4 is 0.70, it would appear that there is a significant difference between these two means. Similarly, it would appear that there is not such a significant difference between, for instance, HVA and LVA T_0 and HVA and LVA T_1. Therefore it might be concluded that the interaction among treatments and levels suggests that those Ss of higher verbal aptitude are more susceptible to attitude change because of greater grammatical error than are those of lower verbal aptitude, within the limits of the current study of course.

CHAPTER IV

DISCUSSION

Earlier in this study it was said that English teachers, particularly teachers of composition, had been insistent that correctness in grammar, as well as correctness in other areas of composition, was a necessity for good communication. At this point it might be well to indicate that there is another side to the coin. As a long-time teacher of composition, at the freshman level and at the graduate level, this investigator has heard over and over again the student query, "But what difference does it make?" and "But they seem to understand me well enough." Neither the teachers nor the students have discriminated sufficiently, it seems, between the receiver's understanding or comprehension of what is being said or written and his evaluative response to it. This study purports to make that distinction clearly and precisely and to investigate the differential effects of grammatical error in these two areas.

Following is discussion of each of the hypotheses tested in this study. Each hypothesis will be discussed individually, but a summary discussion will precede the final statement of implications of the outcome of this research.

Hypothesis 1: Increasing degrees of grammatical error will result in increasing proportions of the Ss indicating that the text is "badly" written. The fact that this hypothesis was supported indicates that Ss were cognizant of grammatical error, whether they could "spot" the errors

or not. The preliminary investigation of what the Ss used in this experiment thought of the text indicated that the control message was, in their words, "pretty well written." This pre-study response indicates that the absence of grammatical error was noted by the Ss; the support of the hypothesis within the study indicates that the presence of such error was noted by the Ss. The support of this hypothesis also indicates that any change in attitude and/or comprehension as the degree of grammatical error changes may be considered due to the change in grammatical error. But beyond this it may be assumed from this investigation that although the patterns of linguistic structure, including grammar, are deeply ingrained by the time of college years, they are not so automatically or non-consciously perceived that Ss of the type used in this study do not react to their appropriate or inappropriate patterning. This conclusion also indicates that the redundancies of the English language are such that they do not completely obscure such "gaps" as errors in grammar; that is, the errors do not go completely unnoticed. This conclusion, of course, is the one hypothesized originally, and was supported in all its aspects within the framework of this study.

Hypothesis 2: Increasing degrees of grammatical error will result in significant differences in the S's attitudes toward the message, and the differences in attitudinal response will be increasingly negative as the degree of grammatical error increases. This hypothesis was supported, and we may then conclude that the meaning that a message elicits in the receiver has, as Osgood has indicated, an evaluative component which we may call attitude. Osgood's studies and those of Tucker (1955) and

Darnell (1960) have supported the hypothesis that meaning has an attitudinal component when applied to messages that are more than the concepts which form most of Osgood's messages in the development of his semantic differential. None of these studies, however, has attempted to measure the attitudinal response in terms of comparison with comprehension. If hypothesis 3 is also supported, the evidence will then indicate that the attitudinal component of meaning is separable from other components and will permit us then to proceed to try to discover what factors in verbal communication other than grammar affect this component. If, however, hypothesis 3 is not supported, we will conclude that (a) errors in grammar cause a decrease in comprehension which is itself caused by the attitudinal response or (b) errors in grammar cause a decrease in comprehension which causes a decrease in attitudinal response or (c) errors in grammar cause an interaction which cannot be separated by the methods of this study into its significant components. If we consider (a) above, we must conclude also that the redundancy built into our language is not such that it maintains the same attitudinal meaning for the message whether there is or is not grammatical error present. Conclusions (b) and (c) above say somewhat the same thing: that the built-in redundancy of English is not such that it covers the attitudinal component of the meaning of the message.

Hypothesis 3: In written samples of normal English, increasing incidence of grammatical error will not result in significant differences in immediate comprehension of the material. Since this hypothesis was supported, several conclusions may be made. Among the most important is

that language, particularly the English language, is indeed redundant in terms of its ability to communicate the "material" or "information" of the message. In the theoretical rationale for this study it was suggested that "the fixed order of morphemes in certain constructions and the definable degree of freedom, are basic to language" (Gleason, 1961, p. 57). If Gleason meant to indicate that the structure of grammar of the language was a function of the ordering of the morphemes, and that that ordering was inviolate, the current study indicates that "disordering" of parts of the message does not have a significant effect on the reception or decoding of the message. But it should be obvious that so-called errors in grammar are tantamount to a kind of disordering and that the maintenance of decoding ability in spite of such error must be accounted for by something which Morris, Carroll, and others have called redundancy. English, in contrast to languages such as Chinese, Latin, and some of the American Indian languages, relies heavily on word order for part of its meaning-eliciting potential. The maintenance of appropriate word order must be a part of this redundancy and must help "cover" the errors in grammar which were used in this current study. Indeed, most of the errors in the current study still keep the basic root of the appropriate word and only one of the morphemes, usually an affix, accounts for the "bad" grammar. The support of this hypothesis also suggests that noise in the communication system can be tolerated, in terms of comprehension at least, to a quite extensive degree. It is also a fact that many languages (other than English and most of the Indo-European languages) do not rely on inflectional morphemes to the degree that English does. We have assumed in the past that these inflectional morphemes, particularly those showing

number, tense, case, mood, were necessary for effective communication. The present study indicates that such is not necessarily the case. Most of the examples of "bad" grammar in the test samples were bad in that the inflectional morphemes were not the "correct" ones. Since the study shows that comprehension under all five degrees of grammatical error was not significantly different, one must conclude that these inflectional morphemes do not carry the burden of meaning that has been supposed heretofore.

Hypothesis 4: Differences in verbal aptitude will reflect significant differences in the Ss' ratings of the text as "well written" and "badly written." This hypothesis was supported and suggests rather strongly that verbal aptitude scores have something to say about the ability of the Ss to discover, in the normal reading process, grammatical errors and to react to them so that there may be a distinction between the evaluative response toward the writing at various levels of encoding ability. That is, Ss who have the higher level of verbal aptitude will be more cognizant of the incidence of error than will those at the lower level. Since the construction of verbal aptitude tests is based on a theoretical rationale which includes statements such as Ss who can "spot" grammatical errors better than other Ss will score higher, the previous conclusion is obvious. It is interesting to note, however, that the College Boards Verbal Aptitude Test, until just recently, has not relied very heavily on a critical reading exercise. Many English teachere have noted, and sometimes complained, that the English Composition Test, on the other hand, did rely heavily on the ability of the student to "spot"

errors and be critical of them; reference is made here to the so-called "Interlinear," which required the student to read a sample of English in which there were about the same number of errors as are included in the Treatment 4 version of this experiment's test samples and to mark them and correct them. It must be added, however, that not all of the errors by any means were what has been defined here as grammatical; perhaps only a quarter of the errors were similar to those included in the current test samples. Nevertheless, colleges which require the College Board Examinations rely more heavily on the Verbal Aptitude Examination than on the English Composition Test, without considerations of the kind that are represented here in these conclusions.

The prediction that differences in verbal aptitude would not show significant differences in attitudinal responses was supported, and indicates that the range of verbal aptitudes represented in this study were such that the Ss at the lower level of verbal aptitude were as much affected in their attitudinal responses as those at the upper level. The implication here is that the evaluative response of the Ss to errors in grammar is not necessarily a function of the Ss' ability to score highly on a verbal aptitude test, unless, of course, his verbal aptitude score is far below those accepted for college entrance. Although it may seem that support of this prediction would indicate that the evaluative component of the meaning of a message is the same regardless of the ability of the receiver of a message to decode it, the limitations of the current experiment suggest at least that there may be a possibility that the built-in redundancies of English are sufficient to overcome the range

of differences in ability to encode and decode as represented in this study.

The additional prediction that differences in verbal aptitude would not have a significant effect on the comprehension of the message was also supported, but this result should be viewed as very limited in terms of the definition of verbal aptitude used in this study. First, it was defined that verbal aptitude would have only two values: at and above 552, and below 552. One fact about the range of verbal aptitude for the Ss used in this experiment is that no S was below 400; this fact rules out people who really have a limited ability to encode and decode.) The partition of the Ss into two groups was designed in parallel to the admission requirements usually used in determining a person's ability to pursue successfully a collegiate career in an institution like Rensselaer. Many colleges, particularly the few remaining state institutions which must accept <u>any</u> student who has graduated from an accredited high school in the given state, accept students whose verbal aptitude score is considerably below 400. It might be concluded that this prediction was supported mainly because of the limitation on the verbal aptitudes of the Ss used in the experiment. On the other hand, even those schools which do not accept students whose verbal aptitude score is below 400 or even 450 still require the student to be instructed in English composition and to pay attention to matters such as grammar. This policy, it must be assumed, is based on some kind of recognition that correctness in grammar is a necessary factor, or in the students' terms a necessary evil, in the educational process.

A further conclusion from the support of this prediction is that within the given range of verbal aptitude scores used in this study Ss have acquired such habits of language, both encoding and decoding, that they tend to perceive strings of words and/or morphemes in such a way that errors in grammar have no significant effect and that the two ranges in verbal aptitude are not significant in terms of discriminating among such Ss.

In summary then, it can be indicated that the current study has shown that there is the possibility and even high probability of a significant relation between errors in grammar in written English text and the perceptions of college freshmen. Readers were aware of some difference among the treatment versions and since the only difference that has been induced into the five versions is that of grammatical error, all other variables having been controlled and/or taken into account, one must conclude that what they are aware of is the effect of grammatical error. The attitude and comprehension test results indicate that it is attitude and not comprehension that is affected by the incidence of grammatical error.

Implications for the Future: Since the hypotheses of this study are supported, a number of future investigations are immediately suggested. One may well ask the "big" question: what constitutes incorrectness? If, as was quoted from Francis earlier, correct grammar is a matter of custom as well as structure of the language, how is the custom developed, in what social and other contexts does custom differ and how does this

kind of social difference affect the language itself and the response patterns to the language? One area in the study of communication that appears to be almost void of precise and useful experimentation is that of personality. One may very well ask questions regarding the effect of so-called incorrectness in grammar or syntax on different personality typologies. One is tempted to suggest even that those teachers of composition who seem most adamant in matters of correctness may themselves form a personality typology similar to Rokeach's theory about isolated persons in a particular belief system (Rokeach, 1960, p. 398). For those interested in the cross-cultural aspects of communication, an interesting series of questions regarding the status of grammatical correctness in native languages and in borrowed languages may be asked. Here it seems new ideas for investigation are legion. In the area of applications of information theory to the communication process one may ask many questions about the "noise" effects resulting from incorrectness, about the abilities of channels of various kinds to detect and correct incorrectnesses that matter. One may even be tempted to suggest that for ultra-long-distance telecommunication (so-called space-talk) a computer-like language analyzer may be constructed to receive communications, evaluate them in terms of structural correctness (have concurrent messages been garbled or have elements of the message been left out, and similar questions), feed back to the origin any corrective measure indicators, re-receive the corrected message and upon evaluation of it as being AOK, send it on to the receiver. Such a science-fiction idea will be dependent on some kind of theoretical knowledge as to the effects of grammatical incorrectness on the receiver of the message.

Perhaps it will be appropriate to end this discussion with the statement that it appears that so little is known about the experiential effects of garbling of the syntax of English, or of any national language for that matter, that it behooves us to spend a good deal of effort in the immediate future in building some kind of theory, some kind of processual theory for the structure of language.

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APPENDIX A

SAMPLE TESTS, VERSIONS 0, 1, 2, 3, 4

Note: The sample tests included herein are Xerox copies of the original spirit duplicated test booklets. The paper used in these copies is Eaton's "Eterna" archives bond, whose long-lasting characteristic accounts for the slightly grey color.

DO NOT WRITE IN THESE BLANKS | FILL IN THESE BLANKS | Version 0

Degree Version _____

V. A. _____

_____
Student's Name

_____
Class and Major

INSTRUCTIONS

This is a special exercise which you are required to do during this class period. The objective is to measure the group's ability to read text of the kind that is in your textbooks and to evaluate your ability to respond to it. Although you will not be "graded" on the work you do during this exercise, a record will be kept of how well you do and some judgment will be made of your ability. It will be prudent, therefore, for you to do as well as you can.

First you will be asked to read an essay of some 1250 words in length. Read it carefully but do not try to memorize what you are reading. Read at a speed which seems appropriate to you in terms of the text itself and your own reading ability. Speed of reading is not a matter of interest in this exercise.

Next you will be given a new kind of test to see what you have been able to understand from the text. When you get to the test, read its instructions carefully; they are very brief but important.

Third, and last, you will be asked to answer one question about the text, your answer being one check mark in an appropriate space. Again do precisely what the instructions given there say.

As you go through the pages of this booklet, DO NOT TURN BACK TO ANY PRECEDING PAGE.

DO NOT ASK ANY QUESTIONS OF THE INSTRUCTORS OR OF YOUR FELLOW STUDENTS. None of them, probably, knows the answer. Read your instructions carefully and you will know all you need to for this exercise.

TURN THE PAGE NOW AND PROCEED. Read the essay and continue on through all the pages of this booklet. When you are finished, hold up your hand.

THE NATURE OF STRATEGY*

It is all too clear at this moment that there are many ways for a book to begin; and most of those in plain sight are transparently bad. We are tantalized by the thought that somewhere among them may lie hidden a few having such noble qualities as these: The readers are informed -- perhaps without suspecting it, though in the clearest prose -- of what the writer intends to discuss; yet at the same time, it sounds like the Lorelei calling. Whereupon these readers resolve into two groups: The first, a large and happy family really, will stick to the book to the end, even though unimagined adversities impend. Further, this group will always think and speak kindly of it, and will doubtless have at least one copy in every room. The second group is most briefly described by stating that it differs from the first; but the book acts immediately as a soporific on all unpleasant passions, so, as it is sleepily laid aside, the sole lasting impression is that of a good gift suggestion.

If we could devise an opening strategy such as that, it would wonderfully exemplify the theme and aims of the book, for our concern throughout will be with a method for selecting best strategies, even in contexts where the word 'strategy' itself may not be in common use.

The contexts of interest to us are those in which people are at cross-purposes: in short, conflict situations. The problem of how to begin this book is recognizably of that type, for certainly you and the writer are at cross-purposes, as our

* from Williams, J. D. The compleat strategyst. New York: McGraw-Hill, 1954, pp. 1-4.

interests are opposed -- in a polite way, of course, but definitely opposed. For we hope to cozen you into a very difficult type of intellectual activity, while you a reasonable person with enough troubles already, may crave only relaxation or satisfaction of curiosity. This conflict of interests is essential in the situations we shall study.

Another element is also essential and it is present here too: Each of us can exert some control over the situation. Many ways will occur to you: for one, you may throw the book at the cat, thus irritating both the writer and the cat, but at some cost in property, perhaps some in self-respect, and undoubtedly some in deteriorated relations with the cat. Or you may skim the hard parts, and so on. There are aspects within the control of the writer, too, such as the choice and treatment of content -- but it is not necessary to labor the point. And a further characteristic element appears: Some aspects of the situation are not within the control of either of us; for example, a multitude of events in our pasts and extraneous influences during the writing and reading periods will play important roles. Of course this particular problem, of beginning the book in a really optimum way, has a further characteristic which we shall henceforth shun, namely, it is too hard -- else we should have solved it.

The restrictions on the subject matter being so few and mild, it follows that the set of conflict situations we are willing to consider is most notable for its catholicity.

There is no objection, in principle, to considering an H-bomb contest between Mars and Earth, or a love affair of the Barrett-Browning type. The contest may be economic in character, or it may be Musical Chairs. Or it may be almost any one of the myriad activities which take place during conventional war. It doesn't follow that we have a nostrum for strategic ills in all these fields, but there is a possibility that our offering may as a method, perform useful service in any of them.

The method which will be presented is identified by the catch phrase Game Theory or, time permitting, the Theory of Games of Strategy. If this is your first encounter with that unlikely sequence of nouns, the sole reaction is probably: Why? Well, the idea takes its name from the circumstance that the study of games is a useful and usable starting point in the study of strategy. That does not really help, for again we hear: Why? Well, because games contain many of the ingredients common to all conflicts, and they are relatively amenable to description and to study. (Incidentally, having used the word 'game' to name the theory, we then call any conflict a game when we are considering it in the light of the theory.)

To illustrate the point, let us run our minds over a Poker game, keeping watch for items which are significant in, say, a military conflict. You and four others are thus studying human nature, under a system of rewards, you hope.

We note at once that the players have opposing interests; each wants to win and, because the winnings of one are necessarily the losses of another, their interests are opposed. This provides the basis of conflict. We observe that some elements of the action, being personal choices, are completely within your control. And the same being true for each player, there are elements which are not within your control; worse, they are controlled by minds having interests inimical to yours. Finally, there are elements of the game that are not, under the rules, within the control of any player, such as the order of the cards in the deck. These elements may be thought of as being controlled by Nature -- who has a massively stable personality, a somewhat puckish attitude toward your important affairs, but who bears you no conscious malice. These are all surely familiar aspects of any conflict situation.

Another characteristic is that the state of information -- intelligence, in the military sense -- is a factor, and, as usual, is an imperfect and hence troublesome factor; we don't know what the other fellow's hole card is. There is also the bluff by which you, or the opposition, give false evidence regarding intentions or strength of forces. Other similarities will occur to you; people even get killed, occasionally.

But the analogy should not be pushed too far. You can

think of many aspects of warfare which are not reflected in Poker. One tank will sometimes kill two tanks, in a showdown; whereas a pair of Jacks always wins over an Ace-high hand in the showdown. Of course Poker could be modified to make it contain showdown possibilities of this kind, say by ruling that an Ace is uperior to any pair, up to Jacks, whenever anybody's wife phones during the play of a hand. But the fact is that games don't exhibit all the complexities of warfare and of other real-life conflict situations -- which is precisely why they are usable starting points for a study of strategy. In the early stages of developing a theory it just is not possible simultaneously to handle very many interacting factors.

It is probably clear, then, that games do contain some of the basic elements that are precent in almost any interesting conflict situation. Does it follow that we can learn useful things by beginning a study with them? Not necessarily. It may be that military, economic, and social situations are just basically too complicated to be approached through game concepts. This possibility gains credence from the fact that the body of Game doctrine now in existence is not even able to cope with full-blown real games; rather, we are restricted at present to very simple real games, and to watered-down versions of complicated ones, such as Poker.

WITH PEN OR PENCIL, FILL IN THE BLANKS IN THE TEXT BELOW WITH THE WORD YOU CONSIDER MOST APPROPRIATE. TRY NOT TO LEAVE ANY OUT. WORK ALONG FAIRLY QUICKLY; DO NOT LABOR OVER ANY BLANK.

If we could devise _____ opening strategy such as _____, it would wonderfully exemplify _____ theme and aims of _____book, for our concern _____ will be with a _____for selecting best strategies, _____ in contexts where the _____ 'strategy' itself may not _____ in common use.

The _____ of interest to us _____ those in which people _____ at cross-purposes: in short, _____ situations. The problem of _____ to begin this book _____ recognizably of that type, _____ certainly you and the _____ are at cross-purposes, as _____ interests are opposed -- in _____ polite way, of course, _____ definitely opposed. For we _____ to cozen you into _____ very difficult type of _____ activity, while you a _____ person with enough troubles _____, may crave only relaxation _____ satisfaction of curiosity. This _____ of interests is essential _____ the situations we shall _____.

Another element is also _____ and it is present _____ too: Each of us _____ exert some control over _____ situation. May ways will _____ _____ to you: for one, _____ may throw the book _____ the cat, thus irritating _____ the write and the _____, but at some cost _____ property, perhaps some in _____, and undoubtedly some in _____ relations with the cat. _____ you may skim the _____ parts, and so on. _____ are aspects within the _____ of the writer, too, _____ as the choice and _____ of content -- but it _____ not necessary to labor _____ point. And a further _____ element appears: Some aspects _____ the situation are not _____ the control of either _____ us; for example, a _____ of events in our _____ and extraneous influences during _____ writing and reading periods _____

YOU ARE NOW ASKED TO INDICATE HOW YOU FEEL ABOUT THE ESSAY YOU HAVE JUST READ. BETWEEN EACH PAIR OF WORDS YOU WILL FIND SEVEN BLANKS. PUT AN X IN THE ONE THAT REFLECTS YOUR REACTION. HERE IS AN EXAMPLE:

SCIENTIFIC RESEARCH

COLORFUL	___	___	___	___	___	___	X	DULL
INTELLIGENT	___	___	___	X	___	___	___	STUPID
WORTHLESS	___	___	___	___	X	___	___	VALUABLE

If you felt that scientific research was very dull, you would put an X in the first line at the far right. If you felt that it was neither intelligent nor stupid, you would put an X in the middle blank of the second line. And if you felt that it was only slightly valuable, you would put an X in the third line in the second blank from the right. Now put one X in each line of the following several lines, remembering that you are stating your reactions to the essay you have read.

THE NATURE OF STRATEGY

VALUABLE	___	___	___	___	___	___	___	WORTHLESS
WEAK	___	___	___	___	___	___	___	STRONG
PLEASANT	___	___	___	___	___	___	___	UNPLEASANT
HONEST	___	___	___	___	___	___	___	DISHONEST
PASSIVE	___	___	___	___	___	___	___	ACTIVE
UNFAIR	___	___	___	___	___	___	___	FAIR
LARGE	___	___	___	___	___	___	___	SMALL
CLEAR	___	___	___	___	___	___	___	HAZY
ROUGH	___	___	___	___	___	___	___	SMOOTH
BAD	___	___	___	___	___	___	___	GOOD

Do you consider the quality of writing of the essay you have just read to be good or bad? Indicate you answer by checking the appropriate box below.

WELL WRITTEN ____

BADLY WRITTEN ____

THANK YOU VERY MUCH FOR YOUR COOPERATION IN THIS EXERCISE. WE WILL TRY TO GIVE YOU THE RESULTS WITHIN A REASONABLE TIME AND GIVE YOU OPPORTUNITY TO DISCUSS ANY QUESTIONS OR COMMENTS YOU MAY HAVE THEN.

Degree Version _____

Student's Name _____

V. A. _____

Class and Major _____

INSTRUCTIONS

This is a special exercise which you are required to do during this class period. The objective is to measure the group's ability to read text of the kind that is in your textbooks and to evaluate your ability to respond to it. Although you will not be "graded" on the work you do during this exercise, a record will be kept of how well you do and some judgment will be made of your ability. It will be prudent, therefore, for you to do as well as you can.

First you will be asked to read an essay of some 1250 words in length. Read it carefully but do not try to memorize what you are reading. Read at a speed which seems appropriate to you in terms of the text itself and your own reading ability. Speed of reading is not a matter of interest in this exercise.

Next you will be given a new kind of test to see what you have been able to understand from the text. When you get to the rest, read its instructions carefully; they are very brief but important.

Third, and last, you will be asked to answer one question about the text, your answer being one check mark in an appropriate space. Again do precisely what the instructions given there say.

As you go through the pages of this booklet, DO NOT TURN BACK TO ANY PRECEDING PAGE.

DO NOT ASK ANY QUESTIONS OF THE INSTRUCTORS OR OF YOUR FELLOW STUDENTS. None of them, probably, knows the answer. Read your instructions carefully and you will know all you need to for this exercise.

TURN THE PAGE NOW AND PROCEED. Read the essay and continue on through all the pages of this booklet. When you are finished, hold up your hand.

THE NATURE OF STRATEGY

It is all too clear at this moment that there are many ways for a book to begin; and most of those in plain sight are transparetnly bad. We are tantalized by the thought that somewhere among them may lie hidden a few having such noble qualities as these: The readers are informed -- perhaps without suspecting it, though in the clearest prose -- of what the writer intends to discuss; yet at the same time, it sounds like the Lorelei calling. Whereupon these readers resolve into two groups: The first, a large and happy family really, will stick to the book to the end, even though unimagined adversities impend. Further, this group will alwyas think and speak kindly of it, and will doubtless have at least one copy in every room. The second group is most briefly described by stating that it differs from the first; but the book acts immediately as a sopporific on all unpleasant passions, so, as it is sleepily laid aside, the sole lasting impression is that of a good gift suggestion.

If we could devise an opening strategy such as that, it would wonderfully exemplify the theme and aims of the book, for our concern throughout will be with a method for selecting best strategies, even in contexts where the word 'strategy' itself may not be in common use.

The contexts of interest to ours are those in which people are at cross-purposes: in short, conflict situations. The problem of how to begin this book is recognizably of that type, for certainly you and the writer are at cross-purposes, as our

interests are opposed -- in a polite way, of course, but definitely opposed. For we hope to cozen you into a very difficult type of intellectual activity, while you a reasonable person with enough troubles already, may crave only relaxation or satisfaction of curiosity. This conflict of interests are essential in the situations we shall study.

Another element is also essential and it is present here too: Each of us can exert some control over the situation. Many ways will occur to you: for one, you may throw the book at the cat, thus irritating both the writer and the cat, but at some cost in property, perhaps some in self-respect, and undoubtedly some in deteriorated relations with the cat. Or you may skim the hard parts, and so on. There are aspects within the control of the writer, too, such as the choice and treatment of content -- but it is not necessary to labor the point. And a further characteristics element appears: Some aspects of the situation are not within the control of either you or I; for example, a multitude of events in our pasts and extraneous influences during the writing and reading periods will play important roles. Of course this particular problem of beginning the book in a real optimum way, has a further characteristic which we shall henceforth shun, namely, it is too hard -- else we should have solved it.

The restrictions on the subject matter be so few and mild, it follows that the set of conflict situations we are willing to consider is most notable for its catholicity.

There is no objection, in principle, to considering an H-bomb contest between Mars and Earth, or a love affair of the Barrett-Browning type. The contest may be economic in character, or it may be Musical Chairs. Or it may be almost any one of the myriad activities which take place during conventional war. It doesn't follow that we had a nostrum for strategic ills in all these fields, but there is a possibility that our offering may as a method, perform useful service in any of them.

The method which will be presented is identified by the catch phrase Game Theory or, time permitting, the Theory of Games of Strategy. If this is your first encounter with that unlikely sequence of nouns, the sole reaction is probably: Why? Well, the idea takes their names from the circumstance that the study of games is a useful and usable starting point in the study of strategy. That does not really help, for again we hear: Why? Well, because games contains many of the ingredients common to all conflicts, and they are relatively amenable to description and to study. (Incidentally, having used the word 'game' to name the theory, we then call any conflict a game when we are considering it in the light of the theory.)

To illustrate the point, let us run our minds over a Poker game, keeping watch for items which are significant in, say, a military conflict. You and four others are thus studying human nature, under a system of rewards, you hope.

We note at once that the players have opposing interests; each wants to win and, because the winnings of one are necessarily the losses of another, their interests are oppose. This provides the basis of conflict. We observe that some elements of the action, being personal choices, are completely within your control. And the same being true for each player, there are elements which are not within your control; worse, they are controlled by minds having interests inimical to yours. Finally, there are elements of the game that are not, under the rules, within the control of any player, such as the order of the card in the deck. These elements may be thought of as being controlled by Nature -- who has a massively stable personality, a somewhat puckish attitude toward your important affairs, but who bears you no conscious malice. These are all surely familiar aspects of any conflict situation.

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1.

WITH PEN OR PENCIL, FILL IN THE BLANKS IN THE TEXT BELOW WITH THE WORD YOU CONSIDER MOST APPROPRIATE. TRY NOT TO LEAVE ANY OUT. WORK ALONG FAIRLY QUICKLY; DO NOT LABOR OVER ANY BLANK.

If we could devise _____ opening strategy such as _____, it would wonderfully exemplify _____ theme and aims of _____ book, for our concern _____ will be with a _____ for selecting best strategies, _____ in contexts where the _____ 'strategy' itself may _____ be in common use.

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SCIENTIFIC RESEARCH

COLORFUL	___	___	___	___	___	___	X	DULL
INTELLIGENT	___	___	___	X	___	___	___	STUPID
WORTHLESS	___	___	___	___	X	___	___	VALUABLE

If you felt that scientific research was very dull, you would put an X in the first line at the far right. If you felt that it was neither intelligent nor stupid, you would put an X in the middle blank of the second line. And if you felt that it was only slightly valuable, you would put an X in the third line in the second blank from the right. Now put one X in each line of the following several lines, remembering that you are stating your reactions to the essay you have read.

THE NATURE OF STRATEGY

VALUABLE	___	___	___	___	___	___	___	WORTHLESS
WEAK	___	___	___	___	___	___	___	STRONG
PLEASANT	___	___	___	___	___	___	___	UNPLEASANT
HONEST	___	___	___	___	___	___	___	DISHONEST
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FILL IN THESE BLANKS Version 2

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Class and Major

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WITH PEN OR PENCIL, [illegible]

YOU CONSIDER MOST [illegible]

QUICKLY; DO NOT LABOR OVER [illegible]

If we could devise [illegible] speaking strategy [illegible]
they would wonderfully [illegible] and [illegible]
for our concern [illegible]
strategies, [illegible]
shall not [illegible]

The [illegible] of interest to each [illegible]
[illegible] as cultural [illegible]
of [illegible] to begin these [illegible]
[illegible] certainly you and the [illegible]
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difficult type of [illegible] activity, while you e[illegible]
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Another element is also [illegible] and is present [illegible]
[illegible] of us [illegible] court [illegible] conveyed [illegible]
[illegible]ys will [illegible] to you: for one, [illegible] may threaten [illegible]
[illegible] eat, thus inviting [illegible] the writer and the [illegible], but at
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[illegible]
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THE NATURE OF STRATEGY

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RITE IN THESE BLANKS

Version _____

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WITH PEN OR PENCIL, FILL IN THE BLANKS IN THE TEXT BELOW WITH THE WORD YOU CONSIDER MOST APPROPRIATE. TRY NOT TO LEAVE ANY OUT. WORK ALONG FAIRLY QUICKLY; DO NOT LABOR OVER ANY BLANK.

If we could devise _____ opening strategy such as _____ they would wonderfully exemplify _____ theme and aims of _____ book, for our concern _____ will be with a _____ for selecting best strategies, _____ in contexts where the _____ 'strategy' itself shall not _____ in common use.

The _____ of interests to ours _____ those in which people _____ at cross-purposes: in short, _____ situations. The problem of _____ to begin these pages _____ recognizable of that type, _____ certainly you and the _____ are at cross-purposes, as _____ interests are opposed -- in _____ polite way, of course, _____ definitely opposed. For our _____ to cozen you into _____ very difficult type of _____ activity, while you a _____ person with enough troubles _____, may crave only relaxation _____ satisfac tion of curiosity. This _____ of interests are essential _____ the situations we shall _____.

Another element is also _____ and it is present _____ too: Each of us _____ some control over the _____. Many ways will occur _____ you: for one,you _____ throw the book at _____ cat, thus irritating both _____ writer and the cat, _____ at some cost in _____, perhaps some in self-respect, _____ undoubtedly some in deteriorated _____ with the cat. Or _____ may skim the hard _____, and so on. There _____ aspects within the control _____ the writer, too, such _____ the choice and treatment _____ content -- but it is _____ necessary to labor the _____. And a further characteristics _____ appears: Some aspects of _____ particular situation is not _____ the control of either _____ and I; for example, _____ multitude of events in _____ place and contemporaneous

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SCIENTIFIC RESEARCH

COLORFUL	___	___	___	___	___	___	X	DULL
INTELLIGENT	___	___	___	X	___	___	___	STUPID
WORTHLESS	___	___	___	___	X	___	___	VALUABLE

If you felt that scientific research was very dull, you would put an X in the first line at the far right. If you felt that it was neither intelligent nor stupid, you would put an X in the middle blank of the second line. And if you felt that it was only slightly valuable, you would put an X in the third line in the second blank from the right. Now put one X in each line of the following several lines, remembering that you are stating your reactions to the essay you have read.

THE NATURE OF STRATEGY

VALUABLE	___	___	___	___	___	___	___	WORTHLESS
WEAK	___	___	___	___	___	___	___	STRONG
PLEASANT	___	___	___	___	___	___	___	UNPLEASANT
HONEST	___	___	___	___	___	___	___	DISHONEST
PASSIVE	___	___	___	___	___	___	___	ACTIVE
UNFAIR	___	___	___	___	___	___	___	FAIR
LARGE	___	___	___	___	___	___	___	SMALL
CLEAR	___	___	___	___	___	___	___	HAZY
ROUGH	___	___	___	___	___	___	___	SMOOTH
BAD	___	___	___	___	___	___	___	GOOD

Do you consider the quality of writing of the essay you have just read to be good or bad? Indicate you answer by checking the appropriate box below.

WELL WRITTEN _____

BADLY WRITTEN _____

THANK YOU VERY MUCH FOR YOUR COOPERATION IN THIS EXERCISE. WE WILL TRY TO GIVE YOU THE RESULTS WITHIN A REASONABLE TIME AND GIVE YOU OPPORTUNITY TO DISCUSS ANY QUESTIONS OR COMMENTS YOU MAY HAVE THEN.

DO NOT WRITE IN THESE BLANKS FILL IN THESE BLANKS Version 4

Degree Version _____

V. A. _____

_____
Student's Name

_____
Class and Major

INSTRUCTIONS

This is a special exercise which you are required to do during this class period. The objective is to measure the group's ability to read text of the kind that is in your textbooks and to evaluate your ability to respond to it. Although you will not be "graded" on the work you do during this exercise, a record will be kept of how well you do and some judgment will be made of your ability. It will be prudent, therefore, for you to do as well as you can.

First you will be asked to read an essay of some 1250 words in length. Read it carefully but do not try to memorize what you are reading. Read at a speed which seems appropriate to you in terms of the text itself and your own reading ability. Speed of reading is not a matter of interest in this exercise.

Next you will be given a new kind of test to see what you have been able to understand from the text. When you get to the test, read its instructions carefully; they are very brief but important.

Third, and last, you will be asked to answer one question about the text, your answer being one check mark in an appropriate space. Again do precisely what the instructions given there say.

As you go through the pages of this booklet, DO NOT TURN BACK TO ANY PRECEDING PAGE.

DO NOT ASK ANY QUESTIONS OF THE INSTRUCTORS OR OF YOUR FELLOW STUDENTS. None of them, probably, knows the answer. Read your instructions carefully and you will know all you need to for this exercise.

TURN THE PAGE NOW AND PROCEED. Read the essay and continue on through all the pages of this booklet. When you are finished, hold up your hand.

THE NATURE OF STRATEGY

It is all too clear at this moment that there are many ways for a book to begin; and most of those in plain sight are transparently bad. We are tantalized by the thought that somewhere among them may lie hidden a few having such noble qualities as these: The readers are informed -- perhaps without suspecting it, though in the clearest prose -- of what the writer intends to discuss; yet at the same time, it sounds like the Lorelei calling. Whereupon these readers resolve into two groups: The first, a large and happy family really, will stick to the book to the end, even though unimagined adversities impend. Further, this group will always think and speak kindly of it, and will doubtless have at least one copy in every room. The second group is most briefly described by stating that it differs from the first; but the book acts immediately as a soporific on all unpleasant passions, so as it is sleepily laid aside, the sole lasting impression is that of a good gift suggestion.

If we could devise an opeing strategy such as that, they can wonderfully exemplify the theme and aims of the book, for our concern throughout will be with a method for selecting best strategies, even in contexts where the word 'strategy' itself shall not be in common use.

The contexts of interest to ours are those in which people are at cross-purposes: in short, conflict situations. The problem of how to begin these pages are recognizably of that type, for certainly you and the writer are at cross-purposes, as our

interests are opposed -- in a polite way, of course, but definitely opposed. For our hope to cozen you into a very difficult type of intellectual activity, while you a reasonable person with enough troubles already, may crave only relaxation or satisfaction of curiosity. This conflict of interests are essential in the situations we shall study.

Another element is also essential and it is present here too: Each of us exert some control over the situation. Many ways will occur to you: for one, you may throw the book at the cat, thus irritating both the writer and the cat, but at some cost in property, perhaps some in self-respect, and undoubtedly some in deteriorated relations with the cat. Or you may skim the hard parts, and so on. There are aspects within the control of the writer, too, such as the choice and treatment of content -- but it is not necessary to labor the point. And a further characteristics element appears: Some aspects of this particular situation is not within the control of either of you and I; for example, a multitude of events in our pasts and extraneous influences during the writing and reading periods played important roles. Of course these particular problem, of beginning the book in a real optimum way, have a further characteristic which we shall henceforth shun, namely, it is too hard -- else we should had solved it.

The restrictions on the subject matter be so few and mild, it follow that the set of conflict situations we are willing to consider is most notable for its catholicity.

There is no objection, in principle, to consider an H-bomb contest between Mars and Earth, or a love affair of the Barrett-Browning type. The contest may be economic in character, or it may be Musical Chairs. Or it may be almost any one of the myriad activities which takes place during conventional war. It doesn't follow that we had a nostrum for strategic ills in all these fields, but there is a possibility that ours offering may as a method, perform useful service in any of them.

The method which will be presented is identified by the catch phrase Game Theory or, time permitting, the Theory of Games of Strategy. If this were your first encounter with that unlikely sequence of nouns, the sole reaction is probable: Why? Well, the idea take their names from the circumstance that the study of games is a usefully and usable starting point in the study of strategy. That does not really help, for again we hear: Why? Well, because games contains many of the ingredients common to all conflicts, and them are relatively amenable to description and to study. (Incidentally, having used the word 'game' to name the theory, we then will call any conflict a game when our are considering them in the light of the theory.)

To illustrate the point, let us run our minds over a Poker game, keeping watch for items which are significant in, say, a military conflict. You and four other are thus studying human nature, under a system of rewards, your hope.

We note at once that the players have opposing interests; each want to win and, because the winnings of one are necessarily the losses of another, their interests are oppose. This provides the bases of conflict. We observe that some elements of the action, being a matter of personal choice, is completely within you control. And the same being true for each player, there are elements which are not within your control; worse, they are controlled by minds having interests inimical to yours. Finally, there are elements of the game that are not, under the rules, within the control of any player, such as the order of the cards in the deck. These elements may be thought of as being controlled by Nature -- whom, we believe, has a massively stable personality, a somewhat puckish attitude toward your important affairs, but who bear you no conscious malice. These are all surely familiar aspects of any conflict situation.

Another characteristic is that the state of information -- intelligence, in the military sense -- is a factor, and, as usual, is an imperfect and hence troublesome factor; We don't know what the other fellow's hole card was. There is also the bluff by which you, or the opposition, gives false evidence regarding intentions or strength of forces. Other similarities will occur to you; people even get killed, occasionally.

But the analogy should not be pushed too far. You can

think of many aspects of warfare which is not reflected in Poker. One tank will sometimes kill two tanks, in a showdown; whereas a pair of Jacks always wins over an Ace-high hand in the showdown. Of course Poker could be modified to make them contain showdown possibilities of this kind, say by ruling that an Ace is superior to any pair, up to Jacks, whenever anybody's wife phones during the play of a hand. But the fact is that the game don't exhibit all the complexities of warfare and of other real life-like conflict situations -- which is precisely why they are usable starting points for a study of strategy. In the early stages of developing a theory it just is not possible simultaneously to handle very many interacting factors.

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The contents _____ interest to ours are _____ in which people are _____ cross-purposes: in short, conflict _____. The problem of how _____ begin these pages are _____ of that type, for _____ you and the writer _____ at cross-purposes, as our _____ are opposed -- in a _____ way, of course, but _____ opposed. For our hope _____ coax you into a _____ difficult type of intellectual _____, while you a reasonable _____ with enough troubles already, _____ crave only relaxation or _____ of simplicity. This conflict _____ interests are essential in _____ situations we shall study.

_____ element is also essential _____ it is present here _____: Each of us exert _____ control over the situation. _____ ways will occur to _____: for one, you may _____ the book at the _____, thus irritating both the _____ and the cat, but _____ some cost in property, _____ some in self-respect, and _____ undoubtedly some in deterioration _____ with the cat. Or _____ may skim the hard _____, and so on. There _____ aspects within the control _____ the writer, too, such _____ the choice and treatment _____ content -- but it is _____ necessary to labor the _____. And a further characteristics _____ appears: Some aspects

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SCIENTIFIC RESEARCH

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INTELLIGENT	___	___	___	X	___	___	___	STUPID
WORTHLESS	___	___	___	___	X	___	___	VALUABLE

If you felt that scientific research was very dull, you would put an X in the first line at the far right. If you felt that it was neither intelligent nor stupid, you would put an X in the middle blank of the second line. And if you felt that it was only slightly valuable, you would put an X in the third line in the second blank from the right. Now put one X in each line of the following several lines, remembering that you are stating your reactions to the essay you have read.

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HONEST	___	___	___	___	___	___	___	DISHONEST
PASSIVE	___	___	___	___	___	___	___	ACTIVE
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APPENDIX B

COMPOSITION HANDBOOKS

COMPOSITION TEXTS SURVEYED

Barrett, Laurence. Writing for college. New York: American Book, 1956.

Bradford, Curtis, and Hazel Moritz. The Communication of ideas. Boston: Heath, 1951.

Brennan, Maynard J., O.S.B. Compact handbook of college composition. Boston: Heath, 1964.

Buckler, William E., and William C. McAvoy. American college handbook. New York: American Book, 1960.

Davidson, Donald. Concise American composition and rhetoric. New York: Scribner's, 1964.

Gorrell, Robert M. and Charlton Laird. Modern English handbook. Englewood Cliffs, New Jersey: Prentice-Hall, 1956.

Greever, Garland, and Easley S. Jones. The Century handbook of Writing. New York: Appleton, Century, Crofts, 1942.

Guth, Hans P. Concise English handbook. San Francisco: Wadsworth, 1961.

Harrison, M. Clifford. Practical English grammar. Boston: Heath, 1947.

Hodges, John C., Mary E. Whitten, and Francis X. Connolly. Harbrace college handbook. New York: Harcourt, Brace, and World, 1962.

Ives, Sumner. A new handbook for writers. New York: Knopf, 1960.

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Kierzek, John M. The Macmillan handbook of English. New York: Macmillan, 1949.

Leggett, Glenn, C. David Mead, and William Charvat. Handbook for writers. New York: Prentice-Hall, 1960.

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McPeek, James A. S., and Austin Wright. Handbook of English. New York: Ronald, 1956.

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Ostrom, John. The craft of composition. New York: Holt, 1952.

Perrin, Porter G. Writer's guide and index to English. Chicago: Scott, Foresman, 1959.

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Suberman, Jack, and Henry M. Rosenberg. Basic Composition. Englewood Cliffs, New Jersey: Prentice-Hall, 1956.

Taft, Kendall B., et al., The technique of composition. New York: Rinehart, 1960.

Thompson, Wayne N. Fundamentals of communication. New York: McGraw-Hill, 1957.

Waddell, Robert. Grammar and style. New York: Sloane, 1951.

Watkins, Floyd C., and Edwin T. Martin. Practical English handbook. Boston: Houghton Mifflin, 1961.

Wilson, Harris W., and Louis G. Locke. The university handbook. New York: Rinehart, 1960.

Woods, George B., and W. Arthur Turner. The Odyssey handbook and guide to writing. New York: Odyssey Press, 1954.

Wooley, Edwin G., Franklin W. Scott, and Frederick Bracher. College handbook of composition. Boston: Heath, 1958.