SENTENCE COMBINING VERSUS GRAMMAR STUDY: TWO APPROACHES
TO THE STUDY OF SENTENCE STRUCTURE

by

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This study, prompted by Frank O'Hare's NCTE Research Report No. 15, *Sentence Combining: Improving Student Writing Without Formal Grammar Instruction*, was designed to compare the effects of two approaches toward the improvement of syntactic maturity in the free writing of grade ten students over a nine-month period. The experimental group studied certain aspects of traditional grammar, and after the necessary grammatical terminology was mastered, it was used to discuss the various ways of manipulating sentence structure to create more pleasing overall patterns and thereby enhance style. In the second approach, the control group, without formal instruction in grammar, practised sentence-combining problems encompassing a wide variety of syntactic structures. Both the experimental and the control groups also engaged in an intensive free writing program.

Specifically, this research sought the answer to two questions. One, would the experimental-grammar group show more growth in syntactic maturity in their free writing than the control group, and two, would the experimental group write compositions that would be judged superior in overall quality to those of the control group?

The sample used in this study consisted of fifty-six grade ten students attending a large urban secondary school.
All of the thirty girls and twenty-six boys were from a similar upper middle class socioeconomic background and were almost all of average or better ability. The experimental class, with twenty-seven students, met in small group classes once a week for forty-minutes, as did the twenty-nine control group students. Both groups followed an identical curriculum in their regular middle group English classes, which met three times a week. Experimental and control groups did the same number of writing assignments not only in regular classes, but in small group, where, in addition to their work in syntactic structuring, they wrote: (1) three pre- and three post-test compositions on topics devised in parallel forms, with one in each mode given in early October, and the counterpart of each in early June; (2) a pre- and post-treatment writing of a passage on aluminum containing many short sentences which they were asked to write in a better way; and (3) approximately twenty-five free writing assignments over a period of seven months.

In the four pieces of writing done in class at pre- and post-test times, the first ten T-Units in each, forty T-Units for each test time, were analyzed according to two factors of syntactic maturity, T-Unit length and clause length. As a result of the analyses of the data, it was concluded that the control group wrote compositions which were syntactically more mature than the compositions written by the experimental group. The control group
wrote significantly longer clauses, and as a result, longer T-Units than did the experimental group. When compared to the rate of normal growth established by Hunt, the control students showed evidence in their free writing and in the aluminum passage, of a level of syntactic maturity, on both indices, equal to or above that of superior adults.

When nine experienced English teachers were asked to judge the overall quality of twenty-seven pairs of experimental and control compositions that had been matched for sex, I.Q. and ability in English, as well as mode of discourse, there appeared to be no significant difference between the quality of the writing of the control and experimental group. It was concluded, therefore, that the differential gains in syntactic maturity of the control group were not a determining factor in the markers' judgments, which were based equally upon five criteria of ideas, organization, sentence structure, vocabulary and style.
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INTRODUCTION

In the past two decades, education has felt the impact of an explosion in the growth of knowledge in all disciplines, but particularly in the field of language. Teachers are faced with a multitude of recent developments, and they must come to grips not only with the increase in the total body of knowledge, but also with new concepts and approaches. Teachers' concerns over the problems of language instruction are augmented by the current controversy over student literacy. The demand for a "Return to the Basics" has led to a reexamination of the question of how writing should be taught. Should the writing be closely linked to the study of grammar? What kind of knowledge should the student have about the structure of the English language and can such knowledge be used to improve his ability to write well? Can students be taught to manipulate language more effectively without any formal study of grammar?

The purpose of the present study is to compare the effects of two approaches to the improvement of sentence structure in student writing. One approach will involve the learning of grammatical terminology, while the other will employ sentence-combining techniques which do not involve any formal instruction in grammar. Most of the research concerned with the development and measurement
of syntactic maturity have been done in the past twelve years, but prior to this, many investigations of the merits of grammar as an instructional aid in the teaching of writing have been made. These investigations have followed in the wake of successive "revolutions" in linguistic theory, as researchers have sought to discover whether a newer scientific system was more relevant to student rhetoric than was its predecessor. Before surveying some of this research associated with the changing systems of grammar, perhaps it would be well to summarize just what has been happening in the field of grammar since the nineteenth century.

In the December 1974 issue of *English Journal*, Owen Thomas points out how the meaning of "grammar" has undergone several metamorphoses in this century, as it reflects the current changes in the study of grammar. The OED (1933) defines grammar as:

That department of the study of language which deals with its inflectional forms or other means of indicating the relation of words in the sentence, and with the rules for employing these in accordance with established usage; usually including also the department which deals with the phonetic system of the language and the principles of its representation in writing.

This definition not only antedates generative grammar by almost twenty-five years; it also antedates the major publications in structural grammar. Webster's *Third New International Dictionary* (1961) comes closer to the current view:
(a) a branch of linguistic study that deals with the classes of words, their inflections or other means of indicating relation to each other, and their functions and relations in the sentence as employed according to established usage and that is sometimes extended to include related matter such as phonology, prosody, language history, orthography, orthoepy, etymology, or semantics.

(b) linguistics.

(c) a study of what is to be preferred and what avoided in the inflections and syntax of a language.

In 1966 the Random House Dictionary of the English Language states that grammar refers to:

The study of the system underlying the esp. formal features of a language, as the sounds, morphemes, words, or sentences; a theory specifying the manner in which all sentences of a language are constructed.

As Thomas remarks, the changing definitions indicate that the notions of what grammar really is have changed considerably over the years.

Survey of Developments in Grammar

During the early nineteenth century there had been little change in traditional grammar, as it was found to be an adequate framework for the "reconstruction" of Proto-Indo-European, which provided the focus for most of the historical and comparative studies of the era. However, in the last decade of the century, Ferdinand de Saussure's ideas about establishing the study of living language on a scientific basis, introduced in his lectures and published
posthumously (1916), proved to be of fundamental importance to the current European theories of descriptive linguistics. His theories also proved to be the forerunner of the twentieth century "revolution" in grammar study.

**Traditional Grammar**

At about the same time as Saussure was lecturing, there began in Northern Europe a scholarly development of traditional grammar. Most of the authors of the great reference grammars were historically-oriented linguists such as Jesperson (1909-49), Poutsma (1928), and Kruisinga (1925), whose work continued into the 1930's and later. These men were not writing textbooks, but very careful accounts of English on a traditional basis. Jesperson's comprehensive account, written in seven volumes, introduced many innovations which included his treatment of syntax and his classification of words in sentences.

It was to the work of these scholarly grammarians that some of the later linguistic theories were indebted. However, these advances in traditional scholarly grammar were not reflected in the school grammars which were far behind. These texts usually began with a study of parts of speech (which were defined partly according to meaning and partly according to function), and then continued with the practice of parsing. Basically, there were two kinds of grammatical rules: those by which words were arranged in order,
and those by which alterations, such as inflections, were made to the form of words to show such things as case, number or tense. The first of these rules was called "syntax," and the second, "accidence." Syntactically, the most important unit in traditional grammar was the simple assertive sentence, with its variant forms, the interrogative, exclamatory, and imperative sentences. Each sentence was made up of a subject and a predicate (consisting of a verb and its objects or complements, if any), and the modifiers. In analysis, the subject, verb, and complements were identified as single words rather than as noun phrases or verb phrases. Sentences were also defined as simple, compound, complex, or compound-complex, depending upon the type and number of clauses. The latter were labelled as coordinate or subordinate according to their role in the sentence, and as adverbial, adjectival, or noun, according to their function.

**Structural-Descriptive Grammar**

Before the school grammars could begin to catch up with scholarly grammar, recognition of the great achievement of Jesperson and the other scholarly grammarians was overshadowed by the growth of structural-descriptive grammar, which began in the 1930's and owed its inspiration to the work of Saussure, whose insights were particularly valuable to linguists in the United States, who had been working with American Indian language. Here the pioneers were
Franz Boas (1911), Edward Sapir (1921), and Leonard Bloomfield, whose book *Language* (1933) became the standard handbook of American structural linguistics, which reigned supreme until the late fifties. For Bloomfield language was a set of conditioned responses to internal and external stimuli, and, as such, it was a form of human behaviour, but in spite of this behaviouristic approach he believed that linguists should restrict their attention to language forms. As he said:

> Large groups of people make up all their utterances out of the same stock of lexical forms and grammatical constructions. A linguistic observer therefore can describe the speech habits of a community without resorting to statistics . . . he must record every form he can find and not try to excuse himself from the task by appealing to the reader's common sense or to the structure of some other language or to some psychological theory, and above all, he must not select or distort the facts according to his views of what the speaker ought to be saying . . . . The danger here lies in mentalistic views of psychology, which may tempt the observer to appeal to purely spiritual standards instead of reporting the facts. (pp. 37-38)

In this passage Bloomfield's concern to make the study of language more scientific was apparent, as were a number of his other basic assumptions:

1. A linguist must rely upon empirical data rather than upon rules.
2. He must recognize the uniqueness of every language.
3. He must realize the uselessness of philosophical and psychological theories, for "the only useful generalizations about language are inductive generalizations."
4. He must recognize the primacy of speech.

Thus the structural linguist, in "reporting the facts" gathered his corpus, or collection of utterances, and relied, not upon semantic criteria to describe it, but upon the phonological, morphological, and syntactic forms present in the speech signal.

Much of the work in structural linguistics in the fifties was initiated by C.C. Fries, who had for many years urged that grammar courses in the schools be made more effective. His investigations had established that the semi-literate written English of Americans differed from standard English more in the inadequacy of the language than in the number of errors made, and he concluded that grammar teaching should be more constructive than corrective. Commissioned by the National Council of Teachers of English to investigate the role of grammar in the schools, he published his report in 1940. This report contained a partial statement of a new system, which he completed in his book, *The Structure of English* (1952). He totally rejected traditional grammar, seeking instead to build grammar on facts which could be observed and verified. Because his grammar involved a description of speech sounds, a study of phonemics and morphemics was necessary. After this, the grammar turned to a definition of parts of speech or "form classes" which were defined according to their position in the sentence. Thus in the sentence "The _______ fell asleep," only a noun could fit
into the test frame. Classes could also be defined according to form (inflections or characteristic suffixes). Fries replaced the traditional parts of speech with four major form classes and fifteen groups of function words, but this classification was modified by other structuralists. In spite of this precision in defining form classes, little time was spent on parsing, as the principal interest was in syntax, which was investigated by immediate-constituent analysis, a process designed to examine constructions within structures. Having disposed of the "lower" syntactic structures, the grammar turned to the sentence, and established eight to ten "basic sentence patterns" which could be represented in formulaic terms. Text Books based on structural grammar varied considerably, but work with these sentence patterns, as well as form classes and structure groups, was integral to all.

Transformational-Generative Grammar

In the mid-fifties, the transformational-generative doctrines of Noam Chomsky (1957) and others began to question the theories of Fries and his followers, and to criticize their lack of theoretical power. This new grammar incorporated many of the ideas of the structuralists, but differed sharply from them in purpose, as the structuralists described completed language acts, while transformational grammar attempted to account for the ability
of the human mind to produce language. Transformationalists repudiated all theories of grammar which asserted that the sentences of human language could be described adequately by segmenting them into discrete elements and then classifying these elements. In contrast, the theory of transformational grammar claimed that the structure of human language was considerably more abstract than indicated by the simple surface analysis of sentences. Furthermore, the theory claimed that human language was not merely a form of learned behaviour but the product of a highly specified innate mental capacity peculiar to man. While Chomsky pointed out that transformational grammar was not a model for a speaker's linguistic ability, he did hope that the grammar would provide a description of the structure of language that would help to give an insight into this uniquely human ability to use language. This concern, along with the need to justify reliance on intuition instead of a corpus of collected utterances led to the drawing of an important distinction between a speaker's "competence" or knowledge of his language, and his "performance" or actual use of his language from day to day.

The structuralist was analyzing a corpus, which was really a "performance" rather than what lay behind it. He was not willing to rely on his own linguistic intuition (his competence), while the transformationalist was willing to use his own competence, and was trying to describe it.

In the early days of Transformational-Generative grammar, linguists believed that there was a core of simple "kernel" sentences
from which all other sentences could be derived. Later these ideas were abandoned, as linguists came to believe that all sentences were derived from transformations, and thus had an underlying structure. Thus sentences had deep structures which were changed to surface structures by transformations. The deep structure clarified meaning and the surface structure led to the sounds spoken or words written. In the sixties, Chomsky's grammar was modified, and a semantic component was added to the syntactic and the phonological components. The syntactic component, which generated both deep and surface structures, consisted of two parts. Those parts that had to do with deep structure were called the base component, which included both phrase structure rules and the lexicon, and the transformation component, which mapped strings generated by the base into surface structures. This base was at the heart of the system, as it generated the infinite class of structures underlying the well-formed sentences of a language. These structures were then given a semantic and phonetic "interpretation" by the other components. Lexical rules specified how the abstract symbols were to be replaced with words, and phonological rules told what form and sound the words would have.

**Tagmemic and Stratificational Grammars**

Other recent developments in grammar included the work of K.L. Pike in Tagmemic Analysis. A "tagmeme" was a unit defined
as the "correlation of a grammatical function, or slot, with the class of mutually substitutable items that can fill the slot." Another study was that of Stratificational Grammar, devised by S.K. Lamb, which placed emphasis upon the fact that language was a layered system. Structural grammar had developed the notion of syntactic levels, and tagmemic analysis was also concerned with structure levels, and mapped tagmemes into "strings" at three specific levels: sentence, clause, and phrase. Stratificational used six kinds of levels, called "strata."

This brief consideration of some of the recent developments in language gives some indication of the problems besetting English teachers in recent years. Not only must the teacher decide whether the teaching of grammar is warranted, when past research has indicated that a knowledge of grammar does not improve student writing, but also he must determine which system is preferable if grammar is to be taught. Such inquiries must inevitably lead to the realization that no one grammar is a clear and complete answer to the question of how the English language is put together, and how it operates, nor is it an unequivocal answer to the question "What shall I teach?" Traditional grammar has the advantage of familiarity, at least to a degree, for the teacher and student. Both know something of its terminology. Criticism of traditional methods states that its strong commitment to deduction, implemented by parsing, is a negative approach which shows a student how to analyze rather than
synthesize. Traditionalists have also been accused of being unrealistic in the matter of usage, refusing to recognize that many Latinate strictures are no longer valid. Probably the chief criticism directed toward traditional school grammars, however, is that they do not provide accurate or complete definitions.

Structuralists, on the other hand, are said to be more concerned with the exact description of the language than with the operation of the language. For the classroom teacher, the study of typical sentence patterns is likely to be the most useful part of structural grammar. By pointing out changes in word order, inflection, and use of function words, teachers can identify the distinctive structural features in sets of contrasting patterns. Transformational theory's efforts to explain how children acquire language should be of interest to all teachers, but some have discovered that a straight transformational grammar requires complete and systematic derivation of hundreds of structures that are simply accepted as given in other systems.

Perhaps the best solution for the teacher looking for applications of linguistic knowledge to classroom work is to learn enough about the three major approaches given currency today (traditional, structural, and transformational) to enable him to evaluate the text books offered, and to use independent judgment to bring together what seems plausible and workable from various sources. The common denominator of such eclectic grammars will be
an account of the inflections and positions of the four major word classes and various minor categories, an account of basic sentence patterns, and an account of the way in which these basic sentences may be modified, expanded, and transformed.

In devising a grammar course for the present experimental class, the researcher termed the grammar "traditional," but in fact it embodied a little of each of the processes described above. However, the terminology was largely traditional. The purpose of the research was to determine whether the quality of writing, as well as the maturity of sentence structure, of grade ten students could be further enhanced by a study of certain aspects of grammar than by the practice of sentence combining.

Chapter 1 contains a survey of the literature related to the present study, and includes earlier research concerning the relationship between the study of grammar and the writing process. It also traces the development in language studies which have provided the means for measuring normal growth in syntactic maturity in quantifiable terms, and earlier sentence-combining studies. Chapter 2 discusses the design and procedures of the two groups; the group studying grammar was termed experimental, and the group practicing sentence-combining was called the control group.

In Chapter 3 the results of the analysis of the data are presented and discussed, and Chapter 4 contains the conclusions of this study, the implications drawn from these, and some suggestions for further study.
CHAPTER 1

BACKGROUND RESEARCH

As the present study will compare a grammar-oriented approach to the improvement of sentence structure with a sentence-combining approach, that has no formal grammar instruction, it will be necessary to examine the research which has been done in both areas, as well as research done in the field of measuring syntactic growth. Efforts made in the thirties to determine whether the study of traditional grammar led to any improvement in student writing were followed in the late forties and the fifties by attempts to evaluate the role of structural-descriptive grammar in relation to writing. These in turn were succeeded by other experiments to assess the worth of transformational-generative grammar as an aid to literacy. In these last studies, grammar and sentence combining were at first combined, but were later separated, in order to find the effect of each on sentence structure.

Early Grammar Research

In examining the research of the thirties one finds that virtually no evidence was uncovered to support the theory that studying grammar improved writing. However, as John Mellon (1965)
in his comprehensive review of this early research pointed out, most of the studies were directed toward the question of whether grammar had been useful in promoting correct usage rather than whether grammar had been of value in improving sentence structure. Mellon noted that the work of Symonds (1931), Catherwood (1932), Cutwright (1934), and Crawford-Royer (1935) concluded that correct usage was more effectively taught without reference to the grammatical principles involved, and that later studies by Evans (1939), Milligan (1939), Frogner (1939), and Butterfield (1945) suggested that it was better to discuss errors in a "direct or incidental" way, rather than by prescriptive drilling. Thus the "functional grammarians" of the thirties argued that the sole function of grammar was a corrective one, and that its study should be limited to learning the rules of usage. Sherwin (1969), in an exhaustive examination not only of statistical and non-experimental studies using correlation analysis, but also of experimental research, pointed out that "After a tally of procedural and other limitations, the research still overwhelmingly supports the contention that instruction in traditional grammar is an ineffective and inefficient way to help students achieve proficiency in writing."

This type of error-oriented research, based upon objective testing, continued through the fifties and sixties, though now it was concerned to see whether the teaching of structural grammar improved student writing. However, only those aspects of verbal ability which were measurable on objective tests were considered.
In a factor analytic study which defined composition ability in terms of scores on twenty-three such tests, plus quality rating on a single composition, Weinfeld (1957) found no significant differences between students who had studied structural linguistics and those who had taken conventional grammar. Schuster (1961) and Suggs (1961) each compared the above approaches, also using pre-post objective tests. Schuster found no appreciable difference between the two methods; Suggs noted that her structural group had greater gains, but she felt this might be due, in part, to the novelty of the treatment. As Mellon commented, it seemed strange that these studies did not consider using the "direct method" approach in one of their groups, in view of the fact that all the previous research had indicated that the direct method was more effective than the prescriptive study of formal grammar in learning correct usage.

In Braddock's (1963) summation of the results of studies done to determine the relationship between grammar and composition, he stated unequivocally: "... the teaching of formal grammar has a negligible, or because it usually displaces some instruction and practice in actual composition, even a harmful effect on the improvement of writing." (pp. 37-38) However, Meckel (1963) was not sure. In his analysis of the findings of early research, whose methods were often questionable in the light of modern techniques, he concluded that "much of the earlier research on teaching grammar must be regarded as no longer of great significance outside the period in educational history which it represents."
Later Studies in Grammar

The practice of measuring improvement in writing by objective tests rather than by an examination of the writing itself was overcome in part by Harris (1962), in a carefully conducted study which compared the effects of instruction in formal and in "functional" grammar over a two-year period on the writing of London pupils aged 12 to 14. He compared the incidence of errors in the two groups, using a short answer test on the terms and application of formal grammar as well as a count of common grammatical errors in the students' writing. In addition, however, he examined the 500-word before and after compositions according to eleven "criteria of maturing style," seven of which were represented by frequency counts of words per simple and complex sentences, non-simple minus simple sentences, subordinate clauses, complex sentences, different sentence patterns, adjectival phrases and clauses, and qualifying phrases in simple sentences. Harris found that in the traditional grammar group, thirteen of the fourteen common errors were more frequent in the post-test than in the pre-test, while the direct method group had six errors which were more frequent and six that were less frequent in the post-test than in the pre-test. He concluded that "the study of English grammatical terminology had a negligible or even relatively harmful effect upon the correctness of children's writing."
Thus it was apparent that though Harris did examine sentence structure, he was primarily concerned with the occurrence of errors. In this, he resembled Milligan (1939) who had, years before, examined the sentence structure of his grammar and no-grammar groups and found that the grammar classes wrote more simple than complex sentences, but on the other hand, had a higher number of dependent clauses, indicating (though Milligan did not pursue this) that the grammar group wrote many more subordinate clauses in the complex sentences that they did compose than did the no-grammar groups.

A second study that was designed similarly to that of Harris was the two-year research of Bateman and Zidonis (1964) which compared the effects of the study of transformational-generative grammar upon the writing of an experimental group with the "non-grammatical" approach of a control group. Bateman and Zidonis hypothesized: (1) that a study of TG grammar could reduce the number of errors in student writing, and (2) that it could also improve the ability to employ mature sentence structure. In their assessment of errors, the researchers computed ratios of error free sentences to total sentences and found that the gains of the grammar class were significantly greater than those of the no-grammar classes. The grammar group also did better in the pre-post error reduction scores. Thus Bateman and Zidonis differed from Harris, for their findings apparently indicated that the study of transformational grammar did reduce error.
In their efforts to discover whether students could learn to apply transformational rules to their writing and improve their sentence structure, Bateman and Zidonis gave their students six pre-test and six post-test compositions during the first three months of the first year and the last three months of the second year. As these were examined for errors, sentences were separated into two types; those with errors, and those without. The "structural complexity" scores for sentences of each type per student per test were calculated by adding one to the number of transformations it contained from a list of approximately fifty such rules. The increase in average structural complexity scores for well-formed sentences was 3.8 for the control class and 9.3 for the experimental. The latter represented an increase of over five transformations per sentence. However, the greatest changes in the experimental group were made by only four students, who comprised one-fifth of the subjects.

John Mellon (1969), who based his study upon this pioneer work in sentence-structure hypothesis, was critical of a number of features of the Bateman-Zidonis research: (1) he questioned whether analysis of variance was the appropriate statistic in view of the fact that most of the gains were made by four students; (2) he thought the researchers should have taken heed of Hunt's findings in their means of determining "structural-complexity," but as O'Hare (1974) later pointed out, their study was completed
in the same year as Hunt's (1964); (3) Mellon believed that more information should have been given about the course of studies followed by both groups; and (4) he disputed the validity of the Bateman-Zidonis argument that "pupils must be taught a system that accounts for well-formed sentences before they can be expected to produce more of such sentences themselves" when research had proved that children had virtually mastered sentence production by the time they came to school.

Criticism of the Bateman-Zidonis study was also made by Robert Potter (1967) in his study which attempted to determine the aspects of grammar which might be relevant to the improvement of composition. He contended that past studies considering the relation of grammar to composition had established very little beyond the fact that traditional grammar taught in isolation had little effect on student writing. Potter's reservations about research in this area included: (1) studies often seemed to neglect the difference between approaches to language study and the particular grammar used to describe the language. As a result, significant differences ascribed to the latter might easily be caused by the former. Potter argued that a competent study must see that enthusiasm in teaching, new books or materials, and exciting methods were common to both control and experimental groups; (2) some studies, such as the Bateman-Zidonis, had a very narrow definition of "good writing," for they considered only
the grammaticality and the complexity of the writing; (3) if a study was concerned with the effect of grammar on composition, the question went beyond the relative effectiveness of grammars A, B, C, or D; each grammar had to be tested against a proven "non-grammatical" method of teaching composition.

Potter's approach to the question made certain assumptions: (1) that instruction in grammar, the basic patterns and transformations of language, would have little effect on usage, which was concerned with the proper use of variant lexical forms; (2) that written English was a separate dialect that must be learned by students and that this process of converting spoken English into the patterns of formal written English might be referred to as "normalization"; (3) that it was necessary to know what processes of normalization separated good writers from bad, and if these differences could be quantified in grammatical terms it might be possible to identify the facets of grammar which would effect composition.

In his study Potter had 100 students from five average tenth grade classes write compositions of 500 words on an expository topic "The Qualities of a Good Teacher." Since the object of the study was "grammar" and not usage, Potter had all gross mechanical errors corrected and the papers uniformly typed in order that the four teacher markers would not be influenced by the "halo" effects of good writing, mechanics, and spelling. These markers rated the papers "good," "average," or "poor."
twenty worst were then submitted to two other markers for a second evaluation. Potter typed the individual sentences in the two groups of papers onto McBee Keysort cards which were then coded and punched to indicate the presence or absence of certain grammatical features. The two groups of papers were examined first according to established criteria such as subordination index, T-Unit length (Hunt, 1965), and sentence length. Potter found that these indices were not really useful in comparing the work of students when quality of writing was made the differentiating feature. Sentences on good papers were a little longer, and the T-Unit ratio between the two groups was exactly the same as the ratio for sentence length, an unexpected development, as Hunt had found T-Units a more discriminating measure. The subordination index was also ineffective, as it was the same for both groups. Looking further, he found poor writers used more T-Units because they wrote simple, basic sentence patterns, with less internal modification, and thus they had double the number of T-Units under six words that the good writers did.

A comparison of sentence patterns showed that the poor writer used more subject-verb-object sentences, a fact that made Potter wonder why language texts advocated that students "write more S-V-O sentences." His data also raised questions about the

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*A T-Unit consisted of a principal clause and any subordinate clause or nonclausal structure attached to, or embedded in it.*
standard warning against the passive voice, as twice as many passives appeared on the good papers as on the bad. He concluded that poor students needed to be instructed on the judicious use of the passive. Looking next at sentence openers, Potter found that poor writers used twice as many conditionals, but far fewer transitional expressions. Only in the use of "but," "and," "so," and "for example" did the poor writers even approach the good writers who used about thirty transitional words, from "after all" to "thus."

Potter found that good writers used more words in structures of modification, notably prepositional phrases; there was little difference, however, in either the use of the phrases or the prepositions used. The only significant difference was in the complexity of the objects. The good writers proved superior in modifying their objects with prepositional phrases, clauses, and verbal structures, as well as in using clauses and verbal structures themselves as objects. He also discovered that though the subordination ratio was much the same for the two groups, there was a difference in the way the various types of subordinate clauses were used: (1) nominals were used more by poor writers, but only because they tend to start sentences with terms like "I think," or "I said"; also, poor writers tended to omit "that" in introducing noun clauses where better writers did not; (2) adverbial clauses were also more frequently used by poor writers, but this was because of their predilection for "if" clauses. The good writers,
however, appeared to have a greater command of the many clause-
-introducing conjunctions, and (3) the two groups used about the same
number of adjectival clauses, but the poor writers tended to sub-
stitute "that" for "who, whom, which, when, and where."

Finally, the good papers contained more verbal structures
of every type than did the poor papers; the good writers used twice
as many verbals in the pre-subject position, they used more verbals
as subjects, and more as modifiers of adjectives. Potter concluded
that although his corpus was too small for a meaningful statistical
analysis, it did show that there were measurable differences
between "good" and "poor" writing, and that the teaching of certain
aspects of grammar might be of value in improving composition.

Recent New Zealand Study

When looking at recent research designed to test various
methods of improving student writing, perhaps it would be well to
examine one of the most comprehensive studies of the whole question
of "The Role of Grammar in a Secondary School English Curriculum"
(RTE, Sp. 76) completed in Auckland, New Zealand (1970-73). This
three-year program encompassed 248 pupils taught by three teachers
in eight matched classes of third-form students of average ability,
and followed these students through to the end of the fifth-form,
with a sixth-form follow-up test in November, 1973. There were
three treatment groups:
1. **The Transformational Grammar (TG) Course**, -- which included the grammar, rhetoric, and literature "strands" of the Oregon Curriculum. The grammar aspect included deep and surface structure, embedding, sentence parts, compound sentences, participial modifiers, etc. Students analyzed sentences in order to discover and apply grammatical rules. Under rhetoric they studied concepts of substance, structure, and style in writing and speaking. They wrote for entertainment, information, and persuasion. The literature phase included short stories, poetry, and novels; it introduced key concepts such as subject, form, and point of view during the study of these selections.

2. **The Reading-Writing (RW) Course**, -- included only the rhetoric and literature strands above, with extra reading and creative writing substituted for transformational grammar. No grammar of any kind was taken for three years.

3. **"Let's Learn English (LLE) Course**, -- which employed three widely used resource books by P.R. Smart - *Let's Learn English in the 70's Series*. The grammar taught was traditional school grammar. It included subjects and predicates, objects, complements, parts of speech, inflections, phrases, clauses, and compound sentences. The literature study in this course came from class sets
of fiction, poetry, and drama, with study centered on character, plot, and theme.

At the end of the first year all students wrote a series of four set essays on a variety of topics, each of which was marked by four outside markers, working independently, and using a 16-point scale. Four criteria were used: content, organization, style, and mechanics. Each marker read all essays four times to make his assessment. In the later years the number of markers and essays was reduced. In addition, a sample of the essays was submitted to objective analysis of their syntactic structures and vocabulary levels. The essays were supplemented by a variety of language tests that were given at the end of each year:

1. PAT Reading Comprehension and Vocabulary test (NZCER, 1969).

2. Sentence-combining test, in which pupils were required to join short sentences in a number of ways.

3. English usage test requiring students to correct "errors" in specially prepared short sentences and continuous prose.

4. Objective tests of literature, designed to test students' understanding of unseen selections of fiction and poetry.

5. At the end of the first year, a test was also given in spelling and listening skills, and in the third year, the TG group was tested on their mastery of grammar skills.
At the end of each year the three treatment groups were thus measured on twelve variables: essay total, reading vocabulary, reading comprehension, sentence-combining, English usage, English literature, essay mechanics, style, structure, and content. On none of these did any of the three programs show any significant superiority at the end of the first year. At the end of the second, only one of the comparisons proved significant; the LLE group showed appreciable gain over the RW group in the essay content criterion, but this was considered a chance fluctuation. At the end of the third year, the TG and LLE groups measured significant gains over the RW group in English usage tests, and the TG and RW groups gained over the LLE group in sentence-combining. In the fourth year follow-up, the different programs had produced no important divergent effect on the pupils.

Representative samples of fifty-eight of the essays in each fifth-form group, were, as mentioned above, analyzed for syntactic structures. The first ten T-Units were counted; results proved that the three groups showed no real difference in average length of T-Units. The same essays were also examined to see if the transformations taught in the TG course, viz: prepositional phrases, subordinate clauses, adjectives, participles, gerunds, possessives, absolutes, passives, appositives, comparatives, adverbs, and deletions were used more frequently in the writing of the TG students than in that of the others. The only significant
information to emerge was that the TG group used fewer participles. No evidence was found to support the contention that a study of transformational grammar would lead to an increase in the use of transformations in their writing.

The main purpose of this investigation was to determine the direct effects of a study of transformational grammar on the language growth of secondary students. The results showed that the effects were negligible, as were the effect of their exposure to traditional grammar. This evaluation of the role of grammar served to corroborate earlier finding about the relationship between grammar and writing. These findings were summarized by Wilkinson (1971) who reviewed the grammar research of the past seventy years and found that many of the claims made for grammar had been proven false. Results showed that grammar did not improve composition, and was of no general help in composition. Further, it was often taught to children who had not the maturity or intelligence to understand. Wilkinson stressed that in addition to not facilitating student writing, "... the implication of many studies was ... that it might hinder it." (p. 34) It must be remembered, however, that much of this early research employed methods that would not be considered valid today, and in addition, most of it was "error-oriented" rather than "structure-oriented." Many of these studies tested the premise that by learning a set of rules a student would unconsciously apply these rules to his writing, and by so doing,
have fewer errors. Frequently results were obtained by objective tests rather than the students' compositions. One cannot help speculating as to whether students studying grammar were shown any of the relationships. Bateman and Zidonis, Mellon, O'Hare, Obenchain and others mentioned above demonstrated that practice in the application of specific principles, with or without grammatical terminology, improved student writing.

Language Development Studies

Because most of the recent research in syntactic maturity was dependent upon the indices which were developed to measure this growth, a review of the progress in language studies is included here.

The body of research that attested to children's syntactic growth began with the work of LaBrant (1933), who found that the ratio of dependent clauses to all clauses in written language increased with the age of the writer. In spite of the fact that she noted that the "increase in length of clauses is apparently occasioned by the reduction of clauses to participial and infinitive phrases, and by the elision of words, phrases, and clauses," her research unfortunately led to the conclusion that clause length was not an index of maturity and that sentence length increased among mature writers solely because of the addition of more
subordinate clauses. In 1937, Anderson was concerned with the possibility of developing an easily applied and uniform measuring device. Though he evaluated by statistical methods three indices of language development (sentence length, pronoun index, and subordination index), it was with the last that his concern was most active. However, because of such variables as composition and subject matter, he drew negative conclusions about the generalized application of the subordination index.

In 1940 Heider and Heider found that the sentence structure of hearing children (as opposed to deaf children whom they were also studying) from 8 to 14 had a steadily increasing number of adjective clauses, a conclusion corroborated by Hunt a quarter of a century later. These and many other studies have been critically reviewed by McCarthy (1954), Carroll (1960), Erwin and Miller (1963), Mellon (1965), and O'Donnell et al. (1967). Traditionally, observations on language development have identified increased length of sentence and increased use of subordinate clause as indices of progress toward a mature style. Two important recent studies in this area have been done by Kellogg Hunt (1965, 1970), and by O'Donnell (1967).

**Hunt's Study (1965)**

Hunt in 1965 investigated 1000-word samples of the free writing of eighteen school children in Grades 4, 8, and 12, and the writing of some skilled adults. In order to determine what constituted "maturity" in sentence structure he identified the construc-
tions and structures that distinguished the work of more mature writers from younger, less skilled students. He found that the lengthening of independent clauses by the increased use of sentence-embedding transformations was responsible for much of the "syntactic maturity" in writing. He introduced a new measure, called a "minimal terminal" unit or "T-Unit" which was a refinement of Loban's (1961, 1963) "communication unit." The T-Unit was one main clause plus any subordinate clauses or non-clause structures that were attached to or imbedded in it. This T-Unit increased in length with syntactic maturity. Hunt pointed out that this unit could be identified objectively, would not be affected by poor punctuation, and would preserve all the subordination achieved by the student as well as his coordination of words, phrases, and subordinate clauses. It would not preserve his coordination of main clauses, but excessive coordination of main clauses was not an index of maturity. Hunt also contended that only a structure with a subject and a finite verb should be regarded as a clause (LaBrant had counted coordinate verbs as separate clauses), and he revised the subordination ratio so as to give the mean number of clauses per T-Unit:

\[
\frac{\text{No. of Sub. Cl.} + \text{No. of Main Cl.}}{\text{No. of Main Clauses}}
\]

Hunt's study analyzed sentence length, clause length, the subordination ratio, kinds of subordinate clauses, and a large number of within-
clause structures. He found that the T-Unit was closely tied to maturity, but the amount of T-Unit expansion that could be achieved by the addition of subordinate clauses probably reached a maximum by Grade 12. He also found that the three kinds of subordinate clauses were not of equal value as measures, for only adjectival clauses varied chronologically in such a way as to provide a measure of development. Noun, or nominal, clauses varied with the mode of discourse, and movable adverbial clauses showed no pattern, varying with neither subject or age. Thus the ratio of adjectival clauses was a better measure than the ratio of subordinate clauses.

The final stage of Hunt's study was to determine what constructions accounted for the added length of the clauses. Here nominals such as noun clauses and phrases used in place of nouns and pronouns, and modifiers embedded before and after nouns were found to be the answer. Thus after the maximum increase in subordination clauses, further syntactic growth was achieved by (1) the use of noun modifiers such as genitives, adjectives, prepositional phrases, or non-finite verbs (infinitives, and participles), and (2) nominalized verbs and clauses, including noun clauses, gerund nominals, and infinitive nominals. Hunt concluded that words per T-Unit appeared to be the best index of syntactic growth; clause length was second; and clauses per T-Unit was third.
O'Donnell's Study

Confirmation of the validity of Hunt's indices was provided by O'Donnell, Griffin, and Norris in their study of children's syntax in 1967. This investigation found that when fairly extensive samples of five to fourteen-year old children's language were obtained, that the T-Unit was a valid index of measurement. These researchers had measured not only T-Unit length, but also the number and depth of sentence-combining transformations per T-Unit, a time-consuming process which O'Donnell et al. felt could be dispensed with, as they found a positive correlation between the length of T-Unit and the number of transformations.

In order to see whether the indices Hunt proposed could be computed from smaller writing samples, O'Donnell (1968) devised an experimental instrument for collecting comparable samples of writing from children at various grade levels. This instrument required the rewriting of a passage made up of short sentences in an effort to combine them ("Aluminum" passage). Data from this study indicated that clause length and number of clauses per T-Unit increased together in lower grades, but clause length alone accounted for most of the growth in complexity in higher grades. Since T-Unit length was caused by a combination of the two factors, T-Unit length was judged to be more useful than either of the other two measures as an index of the growth of structural complexity over a wide age range.
Hunt's Study (1970)

In Hunt's 1970 study, he controlled for the influence of subject matter, using the above mentioned passage. He had students from Grades 4, 6, 8, 10, and 12 rewrite the passage. By analyzing these samples with his previously developed measures, Hunt found that a writer's sentences were definitely affected by his syntactic skill, not just by what he had to say, and that syntactic maturity consisted, in large measure, in the ability to embed information within clauses. A replication of Hunt's study was conducted in the Netherlands by Reesink et al. (1971). Using the "aluminum" passage and a child's fable presented in similar short choppy sentences, the researchers found that with increased age subjects wrote longer sentences with fewer T-Units, and mean clause length increased.

In his study, Hunt (1965) found that the growth of his students toward syntactic maturity, as calculated by his measures, was very slow, and might be caused as much by the pupil's cognitive development as by his language instruction. He and O'Donnell established normal parameters of growth which were accepted as "normative" by other researchers, such as Mellon, O'Hare, Combs, and others attempting to measure growth in syntactic maturity. (See Mellon, p. 18, O'Hare, p. 20). The question of whether this rate of development could be enhanced brings us back to Mellon's research, which was similar to Bateman and Zidonis's in that both exposed their experimental groups to a study of transformational
grammar. However, Mellon had no interest in the error-reduction aspect of their study; he did not believe their claim that the learning of grammatical rules per se could improve student writing. He thought that the sentence-combining practice the Bateman-Zidonis students had had probably caused their improvement in writing. Because of this hypothesis, he devised his "transformational sentence-combining" curriculum. In it, however, Mellon also expected his students to learn grammatical terminology.

**Sentence-Combining Studies**

*Mellon's Study*

Mellon's subjects included 247 seventh grade students, comprised of five control classes who studied a course in traditional grammar and five experimental classes who studied a year long course in transformational grammar that included a large amount of sentence-combining practice. These two groups were matched in ability. In addition, there were two placebo groups who studied no grammar at all, but had extra lessons in literature and composition without any extra writing assignments. All twelve classes studied the regular English program. The writing sample at each test time consisted of nine compositions, each written in a class period during the first four and last four weeks of school. Mellon took the first ten T-Units from each composition, making ninety T-Units in all at each test time.
Mellon adapted Hunt's T-Unit, and used as his main dependent variables twelve factors of syntactic maturity, including T-Unit length, subordination ratio, number of nominal and "relative" clauses and phrases (which included adverbial clauses of time, place, and manner), clustered modification, and depth of embedding. Comparison of pre- and post-tests showed that Mellon's experimental group had gained from 2.1 to 3.5 years of growth on the factors for which Hunt had established normal growth per year (nominal and relative clauses and phrases), and significant increases in all twelve factors at the .01 level, in comparison to less than a year's growth on the part of the control group. An 8% subsample of the total student writing was evaluated by independent raters in order to see whether or not this increase in syntactic maturity would be reflected in the overall quality of writing. However, in this respect Mellon's experimental group did not do as well, for the control group was judged to be significantly better. Mellon suggested that this difference might have been caused by the talent of a control teacher, or by the smallness of the sample.

O'Hare's Study

O'Hare (1973), whose study was based on that of Mellon, gave a succinct account of Mellon's work, and criticized a number of aspects of it: (1) he thought that even though Mellon claimed to be assessing the influence of only the sentence-combining features
of his program, the grammatical theories that his students studied could have affected his results. Mellon's experimental students had had to do three things: (a) learn transformational rules and apply them in sentence-combining; (b) learn a set of grammatical rules; and (c) learn concepts like passive infinitive phrases and others. Students spent September to December on grammar, and January to May on the sentence-combining exercises. O'Hare believed that many of these rules and concepts were too difficult for seventh-grade students, particularly those of average or lower ability; (2) O'Hare guessed that grammatical concepts were "mentioned," but not "taught," and he pointed out that Mellon had not stated whether or not his students were tested on their grammatical knowledge; (3) O'Hare speculated that the sentence-combining practices were more than "an activity designed to reinforce and further illustrate transformations earlier learned by the student," as Mellon had stated, particularly as Mellon had prepared extra daily combining practices other than those in his text; (4) O'Hare doubted that Mellon had presented his study in a purely "a-rhetorical" setting, citing evidence to support this contention; and (4) O'Hare suggested that an improvement in syntactic skills should be expected to improve the overall quality of student writing.

In replicating Mellon's program, O'Hare strove to eliminate the faults he found in it. To dispose of the problem of learning grammatical terminology, he instituted a system of non-grammatical
cue words to signal each sentence combining transformation. He controlled the teacher variable by designing two control and two experimental classes, with a total of eighty-three students at the seventh grade level, which he and another teacher taught. Each of them had a control and an experimental class. Students' abilities were measured by the California Test of Mental Maturity, and by T-Unit length in their pre-tests. O'Hare's sentence-combining practice was done in an a-rhetorical setting in order to isolate its effect. He stated that "he took great pains to avoid conditioning students to favour complex syntactic expressions in their actual composition class, where sentence-combining was never referred to."

O'Hare hypothesized that the experimental groups, "exposed to the non-error oriented, grammar-study-free practice of sentence-combining which was wholly dependent on each student's inherent sense of grammaticality" would: "(1) achieve greater growth than the control group on six factors of syntactic maturity: words per T-Unit, clauses per T-Unit, words per clause, noun clauses per 100 T-Units, adjective clauses per 100 T-units, and adverb clauses per 100 T-Units; and (2) write compositions judged by eight English teachers to be significantly superior to compositions written by the control group."

In O'Hare's study, the first ten T-Units in each of five different free compositions encompassing narrative, expository, and descriptive modes were measured from both pre- and post-test samples, all of which were written in class, during the first two weeks in
October and the last two weeks in May. Thus fifty T-Units per student were examined at each testing period, according to the above criteria. In assessing the overall quality of the writing, O'Hare explained that as he had neither the time nor the resources to have all compositions evaluated, he decided to use a "system of forced choices between matched pairs of compositions." Thirty matched pairs of subjects were divided into two groups of fifteen pairs each, with each group of approximately equal ability. Using one composition for each student, a narrative for the fifteen pairs in the one group, and a descriptive for the other fifteen pairs, he obtained a total of sixty compositions, which were rated by the eight independent judges, who made a single judgment on the overall quality, using traditional criteria such as ideas, organization, style, vocabulary, and sentence structure.

Both control and experimental groups followed the regular English curriculum, but the units covered by the experimental group were shortened in order to provide time for the sentence-combining. One-third of the year was spent on reading instruction (teaching reading skills, and giving time for free reading). In addition there were two short units on literature, as well as units on composition, dramatics, library skills, and language study. The control group did not study any kind of grammar, as O'Hare believed that all previous research had indicated that the teaching of formal grammar, as Postman (1967) stated: "does very little, or nothing, or harm,
to students." The control group's literature units included short stories, non-fiction, and poetry. Their dramatic units consisted of improvisations, and the writing and presenting of their own plays. Language study consisted of teacher-made study sheets, and exercises on vocabulary, dictionary skills, punctuation, capitalization, and usage. Spelling was taught "incidentally." Composition was divided into two sections, with journal writing in one, and more formal narrative, expository, and descriptive writing in the other. The experimental group, in addition, had nineteen lessons which taught sentence-combining techniques and provided "abundant practice in sentence-combining," about one-and-a-quarter hours per week in class and a half-hour of homework. Students wrote out all the completed sentences, and in addition, practised choral reading of approximately one-third of them. This may have been done in response to the Miller and Ney (1968) study, which had an experimental class engage in oral practice in manipulating syntactic structures, and found that they gained significantly in the use of practised structures, in the number of words written, and in the use of more multi-clause T-Units.

At the end of the year O'Hare found: (1) that the experimental group had experienced highly significant growth at the .001 level on all measured factors of syntactic maturity; (2) the experimental group was superior to the control on all factors at the .001 level; (3) that the experimental group on the average had scores for syntactic maturity similar to Hunt's 1965 twelfth grade
norms; (4) that the particular teacher or sex of students was not related to treatment effect; and (5) that even experimental students with low IQ's significantly increased in syntactic maturity. In addition, he found that the sixty compositions of the thirty matched pairs, when evaluated, proved that the experimental students wrote significantly better than those in the control group.

**Other Studies**

Other recent investigations concerned with sentence structure and the quality of student writing include the works of Obenchain (1971), Green (1972), Martin (1968), and Crews (1971). Obenchain focused on an approach to expository writing through the study of logical connectives which would be used to develop well-constructed sentences, then paragraphs, and finally, a series of paragraphs. She used a writing-reading approach, which included sentence-combining practice, though in fewer numbers than Mellons' or O'Hare's. Students were asked to combine coherently four related sentences in a number of ways, so that certain ideas were emphasized and others subordinated. In doing this, they would be expected to use the most effective linking devices. After practising these combining problems, students used their solutions as models in answering precise essay questions based on the literature studied. Experimental students gained over the controls on all six writing measures.
Green, Martin, and Crews all sought to develop sentence writing skills in the lower elementary grades. Green did a nine-week study of grade five children, comparing three approaches to developing syntactic fluency: (1) a composition program with sentence combining; (2) a traditional language program, and (3) a composition program with an error-correcting focus. The first group had fifteen lessons in sentence-combining, using structures with adverbial and relative clauses. He found this group had significant gains over group three, but only in mean length of clause in the narrative mode. Further, these gains were no longer apparent on a delayed-test.

Both Martin and Crews, in year-long studies, compared the effects of a linguistically-oriented grammar approach to a "traditional" language approach upon children's writing skills, and both had their subjects practice syntactic manipulation. Martin's experimental pupils used inductive sentence-building exercises designed by Roberts, and were found to have made significant gains over control classes when their writing was analyzed in terms of T-Units and subordination ratio. Crews taught his experimental class such structures as shifting adverbials, prepositional phrases, middle adverbs, simple coordinate conjunctions, participial phrases, and subordinate clauses in order to develop certain writing skills. In their post-writing tests, this group showed greater variety in sentence structure than did the control group.
Combs' Study

A number of studies of the effects of sentence-combining practice upon student writing followed in the wake of O'Hare's. One of the most interesting was that of Combs (1975), whose program was very similar to O'Hare's. His design included four classes, two control and two experimental, with a total of one hundred students. These classes were taught by two teachers, each of whom had one control and one experimental class. All classes followed the same curriculum, which included the study of a number of literary genres, and all classes had the same number and kind of writing assignments. They also did work sheets on spelling, punctuation, dictionary and word skills. Between the post-test and delayed post-test (eight weeks), a unit on myths was studied, and students wrote myths. No grammar was taught. The experimental classes had, in addition to this regular program, two class sessions and one "set" period per week for ten weeks to do the fourteen sentence combining lessons patterned after the Mellon sentences and the O'Hare non-grammatical signals, but using less complex base sentences than O'Hare. Combs considered that although the time span of his study was much shorter than O'Hare's, it would involve approximately the same number of study hours. He cited the work of Vital et al. (1971) which demonstrated that a shorter, more intensive exposure to sentence-combining practice could be effective in increasing syntactic maturity in the free writing of students.
Another adaptation to O'Hare's design was Combs' provision for a delayed post-test to be given eight weeks after the post-test. Combs hoped to prove:

1. Syntactic maturity gains achieved by the Mellon and O'Hare procedures were replicable with a seventh-grade population.
2. Syntactic maturity gains would be retained as measured by a delayed post-test of students' free writing.
3. The overall "quality" of writing of students receiving sentence-combining practice would be judged superior to that of students not receiving SC practice as measured by an expanded matched-pairs design.

The effects of the program were assessed by two types of measures. First, students' compositions written at the three testing times were analyzed to determine words per T-Unit (W/T), and words per clause (W/C). Combs used these indices because Hunt had considered them the most discriminating. The assessment was based upon three-hundred word samples of students' narrative and descriptive writing. In addition, O'Donnell's "aluminum" passage (Hunt, 1970) was administered at post-test time and assessed for differences in mean W/T and W/C. The results of these measures showed significant gains of two years for the experimental group over the control group. The rewriting of the "aluminum" passage also supported the hypothesis, as mean W/T for the experimental group was 11.3 compared to 8.18 for the control.
Second, the compositions from forty-four students (22 control and 22 experimental) were matched and judged twice, once on the pre-test compositions and once on the post-test. The seven teacher-markers, each of whom assessed all pairs and made a choice between them, found no significant pattern of difference between the two groups in the pre-test, but judged the work of the experimental group to be significantly better than that of the control group on the post-test compositions. All papers were given a 0 to 7 rating, depending upon how many of the raters had judged a paper better than its "pair." A second judgment of the quality of writing was made by comparing the pre-test compositions of eleven students in each group with their own post-tests to see if individual gains were apparent. Results showed that there was little difference between the pre- and post-tests of the control students, but that there was significant improvement in the post-test writing of the experimental group.

Combs had thus confirmed the first two of his hypotheses. His report of a two-year gain in the syntactic maturity of his experimental group was very similar to the gain recorded by Mellon, but less than the five year gain of O'Hare's in 1974. O'Hare thought his students achieved greater gains because they had no instruction in grammar, but Combs, whose students also had no grammar, thought many other factors, such as the amount of time spent on sentence-combining practice (both oral and written), and the time span of the study, were involved.
Eight weeks after the sentence-combining program was finished, Combs administered the delayed post test to see if the syntactic gains were retained, and the results confirmed his third hypothesis. However, he found that the syntactic gains measured in the post-test had been cut almost in half, and he stated that this should be remembered when evaluating a program of this nature.

**Criticism of Sentence-Combining by Moffett, Christensen, and Marzano**

Moffett's

The effects of sentence combining on student writing were questioned by a number of educators. Two of the earlier critics were Moffett (1968) and Christensen (1967). Moffett pointed out that teachers should eschew work books and exercises, and work with the child's own language production. He thought that Mellon's study advocated "non-naturalistic" practice activities and he recommended instead "sentence-expansion games, good discussions, rewriting of notes, collaborative revisions of compositions, playing with one-sentence discourse, and verbalizing certain cognitive tasks" (pp. 180-181). To this comment Mellon replied that sentence-combining, apart from any formal study of grammar, could be as "natural" and effective as any language game in Moffett's language arts program.
Christensen's

Christensen, in "Defining a Mature Style" (English Journal, April, 1968) summarized the work of Hunt and Mellon, and stated what he believed to be the radical flaw in both their studies: "They have lumped together two quite different classes of constructions, bound (word) modifiers and free modifiers (which can modify each other, or whole sentences)." He said that sentences were made long by a class of constructions far different in rhetorical effect from nominalizations and relative embeddings. This class was the free modifier which permitted the skilled writer to keep his base clauses short; variations in the use of these free modifiers differentiated individual styles, and students could be taught to use them. In this pursuit, Christensen argued, grammar and rhetoric could be brought together.

Christensen criticized Mellon for teaching a writing process that encouraged students to imitate in their own compositions the long, complex sentences they had constructed in their sentence-combining practice. Christensen deprecated the use of excessive subordination: "... the long clause was not the mark of a mature style, but an inept style ... the easy writing that makes curst hard reading." He believed that a "mature style" emphasized "cumulative" sentences, with short base clauses and a high proportion of free modifiers, especially in the final position. He pointed out that the work of professional writers was characterized by this type of sentence. In his reply to Christensen's charge, Mellon denied
that sentence-combining "had anything to do with what he conceived to be the teaching of writing." Instead, it was "limited to a procedure for heightening the growth rate of syntactic fluency, an aspect of language procedure . . . over which one does not and cannot exercise conscious control." (p. 81) He insisted that Christensen "mistakenly interpreted his experiment as an attempt to teach a mature style . . . but syntactic maturity was not the same as style . . . ." (p. 79)

Marzano's

Christensen had developed a rhetoric program of sentence additive problems in which he gave students a base clause and then suggested the content and grammatical form of the modifiers. R. Marzano (EJ, Feb. 1976) compared Christensen's sentence composing to sentence-combining:

Mellon-O'Hare

The sailor finally came on deck
He was tall.
He was rather ugly.
He had a limp.
He offered them a prize.

Students are asked to combine these into one sentence: The tall, rather ugly sailor with a limp, who had offered them a prize, finally came on deck.

Christensen

Students are given the same base clause: "The sailor finally came on deck," with suggestions that the following modifiers be added:

(a) two prenominal modifiers describing the sailor's height and weight
(b) a participial phrase describing the sailor's walk
(c) a participial phrase describing something the sailor was doing.
Marzano advocated this program of Christensen's as a basis for a comparative study with sentence combining, for he thought this sentence composing process might prove as effective as, and more efficient than, sentence-combining. Marzano was critical of O'Hare's "forced choice" method of judging the effects of sentence-combining on composition. In his own study (1975), he evaluated 100 compositions on a scale from 1 to 9 for overall quality, and he calculated the average frequency of sentence-combining transformations per T-Unit. He found a .51 correlation between the quality ratings and the incidence of transformations, but he emphasized that it was important to remember that sentence-combining might be related to quality without being the cause of it.

Marzano's criticism of sentence-combining was answered in _EJ_, Dec. 1976, by James Ney (see above), who pointed out that Marzano's objection to the forced-choice method of grading compositions had been anticipated, and more recent studies had introduced a gradation of scores method (Ney, 1975; Combs, 1975) which also favoured students who had practised sentence-combining. Ney then quoted a remark from Combs:

Skepticism about SC practice ... derives from a belief than syntactic manipulation encourages over-complicated, badly conceived prose. Unless one is willing to entertain the counter-intuitive assumption that such prose is consistently preferred by teacher-raters, the present study shows that students in the experimental group wrote sentences of improved 'quality.' (p. 18)
Ney also quoted Stotsky (1975), who, in her comprehensive review of sentence combining, argued that SC practice improved composition from another point of view:

... the practice of playing mentally and operationally with syntactic structures leads to a kind of automatization of syntactic skills such that mental energy is freed in a Brunerian sense to concentrate on greater elaboration of intention and meaning.

In the same issue of the *English Journal* as Ney wrote, Combs also answered Marzano's attack, pointing out several errors in Marzano's argument, and adding "that recent studies by Vitale, Perron, Combs, and Pedersen have substantiated the correlation between SC activity and increased judgments of quality in writing." In his concluding remarks, however, Combs warned that one should not claim too much for SC practice, as it was "no panacea; gains drop significantly eight weeks after students quit combining sentences."

**Summary**

A summary of the research directly pertaining to the present study revealed that there was little agreement among experts about the role of grammar in relation to writing, except that taught in isolation it was of little benefit to composition. Potter (1967) noted the need to test the effectiveness of a grammatical approach against a "non-grammatical" approach to composition, and that the methods used should be equally exciting for both. He also stressed
the importance of defining specifically the qualities expected of "good" writing. In his research, he had found that the most marked differences between good and bad writing in grade ten lay in the use of coordinating and transitional devices, the complexity of the objects, and the use of verbal structures.

In the field of language development, Hunt's (1965) studies not only established the fact that syntactic maturity seemed to accompany cognitive growth, but also provided objective measures to describe, in quantifiable terms, the features which constituted syntactic maturity. Hunt concluded that, of these measures, the best were T-Unit length and clause length. O'Donnell et al. (1967) confirmed this when they found that students' ability to write longer T-Units and clauses increased with each grade level. Further, in 1968 O'Donnell, using an instrument he had devised, known as the "aluminum" passage, found that clause length accounted for most of the growth in complexity in the writing of older students. In his 1970 study, Hunt used the same instrument, and found that all the trends apparent in his earlier study were duplicated. His findings indicated that syntactic maturity consisted chiefly in the ability to make many embeddings per clause, and in so doing increasing clause length and T-Unit length.

Once these indices were established as effective means of measuring the ability of students to manipulate language, research began in an effort to determine whether or not syntactic
maturity could be accelerated, rather than awaiting the "glacially slow" development Hunt described as normal. The pioneers in this field were Bateman and Zidonis, whose two-year study, completed in the same year as Hunt's, did not have the full benefit of his findings. Their results showed that a study of transformational grammar by their experimental group of grade nine and ten students enabled this group to increase significantly the proportion of well-formed sentences that they wrote, and to reduce the occurrence of errors in their writing. Mellon, whose study followed in 1967, rejected the Bateman-Zidonis claim that the learning of grammatical rules per se could lead to improvement in student writing or that these rules could be applied in a conscious manner by the writers. Mellon speculated that it was the sentence-combining practice that had resulted in the syntactic gains of the experimental classes, rather than the learning of grammar. In his own research, Mellon's hypothesis was that by teaching his students transformational grammar and having them use the knowledge to practise a great deal of sentence-combining, he might improve their "syntactic fluency." He did so, but in the epilogue to his published study (1969) he stated that the gains of his experimental group were probably due more to their sentence-combining practice than to their study of grammar.

Basing his study on this same premise, that students could improve their ability to manipulate sentence structure better without being burdened with grammatical terminology, O'Hare devised a
study wherein his experimental classes practised sentence-combining problems which were constructed with non-grammatical signals. The gains of these students in syntactic maturity were much greater than Mellon's, and O'Hare attributed this to the non-grammatical approach.

In replicating O'Hare's study, Combs (1975) also had his experimental group practise sentence-combining without having them study any grammar, but he found that while his students did make syntactic gains, these were less than half as great as O'Hare's, more on a par with Mellon's. Further, Combs found that by giving a two-month delayed post-test that the gains of the experimental group were cut in half.

Critics of the sentence-combining approach to syntactic maturity (Moffat, Christensen, Marzano), who believed that it encouraged complicated, wordy prose, were confronted with the fact that in at least three studies (O'Hare's, Bateman-Zidonis's, and Combs's), competent teachers had rated the prose written by sentence-combining classes to be superior to that of the control classes.
Overview

The overall plan of this research was to test whether a study of certain aspects of grammar could be more effective in increasing the normal rate of growth of syntactic maturity in the free writing of grade ten students than the sentence-combining approach advocated by Frank O'Hare in his research report No. 15 for the National Council of Teachers of English. This report, entitled *Sentence Combining: Improving Student Writing Without Formal Grammar Instruction*, explained the type of sentence-combining program given to his subjects. Subsequently, O'Hare wrote his sentence-combining program in a text called *Sentencecraft*, published by Ginn and Company in 1975.

In the present study, there were two normal grade ten classes, a total of 56 students (30 girls, 26 boys). Of these, 27 were in the experimental group, which was divided into 2 small groups, one with 13 and the other with 14 students. The control group had 29 students, divided into two small groups, with 14 in one and 15 in the other. The experimental and the control groups followed the same curriculum for three out of the four weekly English periods. In the
fourth period the small groups met to carry on their grammar study or sentence-combining activities over a nine month period. During this time all students wrote the same number of descriptive, narrative, and expository compositions. Samples of before and after writing were used as a basis for determining syntactic growth. Comparisons of growth observed in the experimental groups were made with the normal growth rate established by Hunt (1965) and with the growth observed in equivalent before and after writing of students in the control groups. Growth in the two groups was also compared to the growth achieved by the subjects of Mellon, O'Hare, and Combs in their studies.

Hypotheses

This study was designed to test the following hypotheses:

1. That the experimental group, studying certain aspects of traditional grammar, would achieve more growth in syntactic maturity than the control group, practising sentence-combining that did not involve formal instruction in grammar.

2. That the experimental group would write compositions that would be recognized by experienced English teachers as superior in overall quality to those written by the control group.
Design of the Study

A 2 x 2 factorial design was used, with grammar study versus sentence-combining, and pre- versus post-test. An analysis of covariance was carried out in order to partial out the effects of I.Q. and previous achievement in English as it was felt that these were the two main factors which might contribute to initial differences in the two groups. English marks were obtained from the student's achievement for the previous year, as indicated by letter grade on his June report. This letter grade was quantified by a scale on which: A = 8, A- = 7, B+ = 6, B = 5, B- = 4, C+ = 3, C = 2, C- = 1. I.Q. score were obtained from an Otis Quick-Scoring Test, Beta Form EM, given to the subjects in September. The two experimental and two control classes had been assigned to their classes according to their timetables, which were flexible enough, however, to permit the subjects to be shifted within the small groups in order to create, after I.Q. and performance in English were considered, a control and experimental population of approximately equal ability and sex. A few students of very low ability were transferred from the population of the study into two other small groups not involved in this experiment, but taught by the researcher. Such a transfer was not possible, however, with all students in this category.
Subjects

Four small-group grade ten classes, totalling 56 students, who were within the normal grade ten range of 15 to 16 years, and had I.Q. scores ranging from 85 to 124, with an average of 109.7 in the experimental group, and 110.2 in the control group. Three students left school during the year, and one transferred in, leaving 15 girls and 12 boys in the experimental classes, and 15 girls and 14 boys in the control classes. Students in both classes were from the same socio-economic background, as they were almost all of Anglo-Saxon origin, from upper middle class homes in which the parents were well-educated and interested in their children's progress.

Variables

I. Independent

(a) Between-Subject Variable: a regular curriculum in English was taught for three periods out of four, and in the fourth two approaches designed to increase growth in syntactic maturity were used. Two small groups studied certain aspects of grammar, while the other two practised a form of sentence-combining which did not involve any formal instruction in grammar. The classes practicing sentence-combining were labelled the "control" group and those studying grammar were called the "experimental" group. Both groups, in addition to their work in sentence structure, carried out a program of free writing.

(b) Within-Subject Repeated Measures Variable: pre- and post-tests were given in October and May.
II. Dependent

A. Two indices of syntactic maturity:
   1. Words per T-Unit
   2. Words per clause

B. A single qualitative judgment based on ideas, organization, style, vocabulary, and sentence structure was made to decide which was the better of two compositions, one experimental and one control, which had been matched for I.Q., ability in English, sex, and mode of discourse.

III. Concommitant: I.Q. Scores and English Achievement Scores.

IV. Extraneous

   Language experiences of the subjects outside the English classes.

Rationale of the Present Study

In seeking to discover the most effective way to help students to improve their sentence structure and their writing style, the present researcher noted Potter's comment that:

If composition improvement is used to justify instruction in grammar, the question goes beyond the relative effectiveness of grammars A, B, C, and D. Each of the grammars must be tested against a proven 'non-grammatical' method. (p. 19)

The choice of "traditional" grammar as a means of enhancing syntactic maturity might well seem quixotic in view of the large body of research attesting to its inefficiency as an aid to instruction in composition,
but in doing so the researcher was moved by a number of considerations:

1. Much of the research done in the first half of the century would not be considered valid in the light of modern methods of research. In addition, most of these early studies were more interested in usage than in grammar, and their results were obtained by objective testing.

2. The investigator hoped: (a) that a study of grammar integrated with the writing process might enable students to see more clearly the importance of structure in improving style; (b) that students would recognize the need for editing skills when the written work was to be published; and (c) that the usefulness of a grammatical vocabulary describing accurately the operating of language would become apparent.

The aim of the researcher was thus to make grammar function in a dual role: analytically, it would show the structure of the language, and synthetically, offer the writer a variety of options from which he could choose to improve his own constructions.

For the "non-grammatical" approach, it was decided to use O'Hare's method of sentence-combining, as it had been proved successful in increasing "syntactic maturity." This term "syntactic maturity"
usually meant that as a writer matured, his sentences grew longer and more complex because his independent clauses were lengthened by increased embedding within clauses. Hunt's indices, such as words per T-Unit and per clause, measured the length that increased with maturity. In the present study, maturity of sentence structure was defined in a statistical sense as the range of sentence types found in samples of student writing.

Limitations of the Study

1. **Design of the Study:**

   (a) The researcher taught both of the experimental-grammar classes and both of the control sentence-combining classes. This was unavoidable as the experiment had to be carried out in classes already assigned to the researcher. Scheduling constraints made other arrangements impossible. However, every effort was made to approach both classes with equal enthusiasm and equal effort, for the researcher was more interested in discovering which method was more effective in improving students' sentence structure than she was in advocating a particular treatment.

   (b) Because the researcher had "intact" classes, students could not be randomly assigned to the control and experimental groups, nor could the time at which classes met be controlled.
(c) The sentence-combining group was arbitrarily labelled the "control" group as it followed a treatment devised by O'Hare, while the group studying grammar was called the experimental group, as the researcher, in designing its course, had attempted to formulate a method of instruction that would be more effective in improving not only the sentence structure but the overall quality of writing, than the sentence-combining approach.

2. Homogeneity of the Subject Population

Not only were the control and experimental classes balanced by I.Q. and language achievement, but they were almost all from the same socioeconomic background.

3. Financial Restraints

Because no funds were available to pay markers, the researcher followed certain procedures not because they were preferable, but because they were practical:

(a) The use of O'Hare's "forced choice" method of evaluating compositions.

(b) The brevity of the pre-marking session.

(c) The size of the sample.
Procedures

Selection of the Experimental Subjects

The tenth grade was selected as the level on which to conduct the experiment simply because, of the two grades taught by the researcher, this one seemed better suited to the purpose of the experiment. One of the reasons for this was that the text used by the control class, *Sentencecraft*, designed as the basis of an elective course, appeared to be more appropriate for a grade ten level, as did the aspects of grammar that constituted the basis of the experimental group's study. In addition, the grade tens represented the transition phase from junior to senior high school students, and it was in this year that increasing emphasis upon written English, as a form distinct from spoken English, was placed.

Procedures in this experiment had to be functional within a given setting: a large urban secondary school operating on a flexible modular system, with students on individual computerized timetables. Within this structure, time was provided for student-teacher conferences, but the class time for English was limited to the four forty-minute periods per week mentioned above. Of these, the one used to carry on the control and experimental programs, i.e., sentence-combining and grammar study, met in small group sessions.

This small group format had a distinct advantage for this type of experiment, as the work done in small group could be kept
completely separate from that done in middle group. The program followed by the control and experimental students meeting in small group classes was never discussed in regular classes. Indeed, such a procedure would have been impossible, as the fifteen students in one small group might be members of three different regular classes. Students were never told that they were part of an experiment, nor did they seem to have any idea that there was a difference in the programs of the small group classes. They easily accepted the idea that the pre-treatment compositions were assigned in order that the teacher might learn something of their ability to write in the various modes, and that the post-treatment compositions were given to see if there had been any improvement during the year.

Another advantage of the small group format was that it permitted a less formal atmosphere, with more interchange and discussion among students. In addition, it allowed students to have a week to complete writing assignments, an integral part of the program for both groups. Unfortunately, there were disadvantages as well, for the weekly interval between classes made it difficult to achieve continuity, which was not a problem in the sentence-combining classes, but a definite detraction in the grammar classes. In the latter, students sometimes needed considerable review before they remembered clearly what they had done the week before. Another disadvantage of the small group arrangement was that two of the weekly classes, one experimental,
and one control, were scheduled for the last two periods in the day, when students were often tired. In addition, members of athletic teams missed a number of these classes because of games or practices.

Of the 58 students who comprised the four small group classes, one boy in the experimental classes quit school, and two boys in the control group transferred out of the school district. Their scores were not included in the data. One boy transferred into the experimental group fairly early in the term, and his input was included. At the end of the study, after all the data had been collected, the scores of four control and one experimental students who had missed the I.Q. test or one of the pre- or post-test compositions were not included in the analysis of covariance described in Chapter 3.

Control Group Treatment

For a thirty-five to forty minute period once a week, the control group practised the sentence-combining problems in the book Sentencecraft, in which were twenty-six lessons, interspersed with eight "Writing Workshops." In the introduction, O'Hare emphasized the importance not only of having something to say, but of knowing how to say it. To this end he suggested that students should learn to manipulate words, phrases, and sentences until they had attained the most expressive combination to describe their thoughts. In his research report (p. 72) O'Hare quoted Christensen (1967), who
said "solving the problem of 'how to say' helps solve the problem of "what to say. . . ." (p. 5). This suggestion that "form" could, in a sense, generate "content" seemed to be part of the philosophy underlying the sentence-combining approach to improved writing in O'Hare's text.

During the course of the study students in the sentence-combining program completed the twenty-six lessons in their text, as well as some typed sheets of additional problems in combining sentences without the aid of signals. These problems, like O'Hare's, employed no grammatical terminology; students were asked to combine the sentences in the most effective way possible. In class, after a brief discussion of any new techniques introduced in that day's lesson or lessons, several sample problems were solved orally before the students went ahead at their own speed. A few completed the lessons during the period, but most had to spend some additional time to finish. Students were encouraged to discuss with each other possible solutions to any questions that proved troublesome, and at some time during the period answers to the previous week's assignment were read aloud. There was a very pleasant atmosphere in the class, as students seemed to enjoy the challenge of manipulating language, particularly in the chapters entitled "Challenge" which offered considerable scope for their ingenuity. The problems in these sections required the use of all the sentence-combining techniques employed in earlier lessons. Some had signals
indicating how the sentences should be combined, and others had none. Students were simply told to "make use of the combining techniques used so far."

O'Hare devised a series of signals that enabled students first to master single-embedding problems, and then to transform and embed a number of kernel sentences into a single sentence. A few examples will serve to illustrate the type of signals given:

**Lesson 1**

Three or four short sentences were combined by deletion and punctuation signals:

A. Helen raised her pistol.
   She took careful aim. (,)
   She squeezed off five rapid shots to the center of the target (, and)

B. Helen raised her pistol, took careful aim, and squeezed off five rapid shots to the center of the target.
   (The signals in the brackets were to be placed in front of the sentence which they follow).

**Lessons 4, 5, 6, 8, 9, 11, 12, and 13**

These involved various combining signals for embedding noun clauses or other noun substitutes, such as gerunds and infinitives:

1. A. I get nervous every time Ben goes for a swim in the ocean because he does not believe SOMETHING.
Something is possible (that).
The undertow sweeps him out into deep water (it-for-to)

B. I get nervous every time Ben goes for a swim because he does not believe that it is possible for the undertow to sweep him out into deep water.

2. A. SOMETHING was predictable.
Fisher crushed his opponent ruthlessly ('s+ly+ing+of)

B. Fisher's ruthless crushing of his opponent was predictable.
(Students were instructed to follow the signals in the order in which they were given)

3. A. SOMETHING was impossible.
John studied during commercials (it...for...to)

B. It was impossible for John to study during commercials.

4. A. I could not follow SOMETHING.
Garcia discussed amino acids brilliantly ('s,+ly+discussion + of)

B. I could not follow Garcia's brilliant discussion of amino acids.
Lessons 15 and 16

These dealt with the embedding of adjective clauses, using repetition as a combining signal, in conjunction with (which), (that), (who), (whom), (which/that) in Part I, and (whose), (when), (where), and (why), in Part II.

A. The room was lit by a single spotlight.
   The diamond was displayed in the room. (where)
   The spotlight was trained on the gem itself. (which/that)

B. The room where the diamond was displayed was lit by a single spotlight that was trained on the gem itself.

Lessons 18 and 19

Here underlining was used as a combining signal, in conjunction with repetition. Students were told to insert the underlined words after the first appearance of the repeated words, to keep underlined words, and eliminate the others.

A. Blanche easily pulled away from the field.
   Blanche is a powerful runner.

B. Blanche, a powerful runner, easily pulled away from the field.

Lesson 21

Here the use of connecting words to combine sentences and establish a relationship between them was illustrated. This
lesson dealt principally with adverbial conjunctions, but also showed the use of the semi-colon, coordinate conjunctions, and adjectival conjunctions.

A. You put it that way. (since)

Something is impossible.

I disagree with your proposal. (it..for..to)

B. Since you put it that way, it is impossible for me to disagree with your proposal.

Lesson 22

The signals (ing) and (with) showed how to combine sentences using participial and prepositional phrases to get the "cumulative" type of sentence.

A. Jill stood at the edge of the cliff.

She looked down on their upturned, nickle-sized faces by the side of the tidal pool. (ing)

She wished she had ignored the dare. (ing)

She felt trapped. (ing)

Yet she knew something. (ing)

She couldn't back down. (that)

B. Jill stood at the edge of the cliff, looking down on their upturned, nickle-sized faces by the side of the tidal pool, wishing she had ignored the dare, feeling trapped, yet knowing she couldn't back down.
Writing Workshops

In addition to the above lessons, and the "Challenge" lessons interspersed between them, there were also eight "Writing Workshops" distributed throughout the text so that one occurred every third or fourth lesson. These outlined writing projects were largely in the narrative, narrative-descriptive, and expository modes. The topics not only offered a wide choice, but were highly imaginative, often humourous, and always relevant to the students' own interests and experiences. In the narrative vein, themes involving the solving of a moral dilemma, or surviving a wilderness expedition were included, as were children's stories, tall tales, daydreams, and nightmares. Many opportunities were provided for media writing in both narrative and expository modes: scripts for television shows, films, or slides; advertisements; writing fairy tales or nursery tales as news flashes; interviews with famous people; letters to the editor; letters to and purportedly from "Ann Landers"; a weekly columnist's view of a current controversy; or a sportcaster reporting a game. Other expository or argumentative topics dealt with public service appeals to support worthwhile causes, and articles to inform and persuade the public about local or national concerns. These workshops were well planned and provided the type of writing experience that students found enjoyable; there was very little complaint about the weekly compositions that were required in conjunction with the sentence-combining problems. Approximately twenty-five of these
assignments were given to each class over a period of seven months. They were termed "free writing" as none of the work was done in class, and there was no instruction or assistance given. Students simply read the material outlined in each "workshop" section and responded according to their own interpretation of the data.

These writing assignments were given to all small group classes, whether they were control or experimental. All compositions were read by the instructor and returned to the student with a comment which was usually designed to increase the confidence and sense of achievement of the writer. No reference was made to sentence structure, in grammatical or non-grammatical terminology, and there was no detailed analysis of the content. The emphasis in small group was always upon encouragement and the atmosphere was congenial. A few minutes at the beginning of each class were usually spent in congratulating students who had turned in particularly good papers the week before, and in reading some of these aloud before returning them. Care was taken to see that all students received recognition as frequently as possible. Occasionally stories or articles were exchanged informally in class, and once the initial reluctance of pupils to emerge from anonymity was overcome, these group sessions proved helpful in establishing some sort of guidelines as to what constituted quality and style in writing. The incentive to edit their work was greatly increased by the possibility of publication. Students were urged to collaborate
with each other in revising their writing. By April, everyone in both groups had submitted at least one piece of writing for publication in what became a 265-page volume. Outside evaluators in the school at the time this book was being collated in preparation for binding commented in their report on the high calibre of the grade ten free writing. The book was published in May, and each student received a copy.

Course Followed by Experimental Grammar Classes

In addition to these "Writing Workshop" assignments, the two small groups making up the experimental classes studied those aspects of grammar which Potter (1967) and Hunt (1965, 1970) had indicated might be helpful to grade ten students in improving their sentence structure. These included:

1. The use of a variety of sentence patterns.
2. The effective use of coordination and subordination.
3. The use of verbals and appositives.
4. The use of transitional devices.

Other aspects of grammar which were covered included a study of the voice and tense of verbs, the agreement of verbs with their subjects, and the reference of pronouns. However, the time spent on these was relatively brief, as the emphasis of the course was upon the work in syntax. This study of the structuring of sentences proved difficult for many of the students, who had had very little
grammar before this year, and much more time than the researcher had anticipated had to be spent on it. It was found that one period a week, of less than forty minutes, was really not enough to ensure a sound grasp of these basic concepts, particularly as some time was used in reading their free writing compositions. Students came for extra help as their timetable and inclination allowed, and after many weeks of continued effort with each of the sections listed above, most of the students demonstrated some proficiency with these aspects of their study. One of the most remarkable features of both these classes in grammar was their good humour. For the most part, they did not like grammar, but because they wanted to do well, they approached each new phase of the work with an honest desire to master it. This attitude made the learning (and teaching) process easier.

**Treatment for the Experimental Group**

After the introductory comments on the small group writing, each class began with a review of the previous week's work, and a discussion of the assignment. The atmosphere of the class was similar to that of a workshop, as students contributed or questioned ideas freely, and helped each other considerably. The instructor explained each phase of the work, using blackboard demonstrations, transparencies, and packages of prepared materials containing outlines and explanations of information presented, as well as assign-
ments to reinforce the concepts taught. Students examined their free writing, which they kept in a binder, to see if they could recognize whatever aspect of sentence structure was currently under investigation. For example, they might look for: (1) variety in their sentence patterns, or (2) effectiveness in their coordination or subordination, or (3) their use of noun clauses or verbals. Students were encouraged to analyze the structure and grammaticality of their own writing, and to recognize the need for revision. As mentioned above, the prospect of publication made the need for editing real.

In the latter part of the course, when students were applying the terminology they had learned to the manipulation of sentence structure, the attitude of the students was more enthusiastic, as they enjoyed exercising their ingenuity in combining sentences through subordination, reduction, or the "cumulative" techniques of Christensen, which emphasized "clusters" rather than clauses. In class, pupils read aloud the sentences they had written in response to various sentence-building activities, and usually the inherent sense of grammaticality of the other students enabled them to tell what combinations were acceptable. The whole emphasis of this course was upon the integration of the study of sentence structure with the writing process.
Summary of Grammar Curriculum

In order to clarify the materials covered with the experimental group, an outline of the course is included here.

1. **Sentence Patterns.** Students were expected to recognize and to write sentences in the following basic patterns:
   
   (a) subject + verb
   
   (b) subject + verb + object
   
   (c) subject + verb + indirect object + direct object
   
   (d) subject + "be"+ complement (noun, adjective, or place phrase)
   
   (e) subject + link verb + complement
   
   (f) subject + verb + object + objective complement (noun or adjective)

2. **Coordination and Subordination.** This work included:

   (a) The difference between coordinate and subordinate conjunctions and the functions of each
   
   (b) The types of sentences: simple, complex, compound, and compound-complex.
   
   (c) The use of connectives with coordinate clauses to show relationships: addition, contrast, choice, or result
   
   (d) Use of conjunctions to show relationships such as time, cause or reason, purpose or result, and condition between main clauses and subordinate adverbial clauses
(e) Use of adjective clauses to enable writers to stress one idea above another

(f) Use of subordinate clauses, modifying phrases, or appositives to correct faulty coordination

3. **Parallelism.** This section covered the writing of coordinate ideas, as well as ideas that were compared and contrasted, and stressed:

   (a) Expressing parallel ideas in the same grammatical form
   (b) Placing correlative conjunctions immediately before parallel terms
   (c) Repeating any necessary words in parallel constructions in order to clarify meaning

4. **Verbals and Appositives.** This study included:

   (a) The dual nature of infinitives, gerunds, and participles, which had many of the characteristics of verbs
   (b) The function of verbals as nouns, adjectives, or adverbs
   (c) Their use as an aid to conciseness
   (d) Dangling participles
   (e) The function of appositives

5. **Misplaced Modifiers.** These were covered very briefly in conjunction with dangling participles.
6. Verbs. This section was brief. It emphasized:
   (a) Present and past tense
   (b) Active and passive voice

7. Pronoun Reference. This part was also very short, and stressed the need to avoid:
   (a) Ambiguous reference
   (b) General reference
   (c) Weak reference
   (d) Indefinite use of "it," "they," and "you."

8. Subject-Verb Agreement. This was mentioned briefly in connection with pronoun reference.

9. Unnecessary Shifts in Sentences. This topic dealt with shifts in:
   (a) Subject
   (b) Tense
   (c) Voice

10. Conciseness. This work stressed the need to eliminate unnecessary words in writing, and the methods of reducing clauses to:
    (a) Participial, gerund, or infinitive phrases
    (b) Prepositional phrases
    (c) Appositives
    (d) Single words.
In order to practise sentence-combining, and to review most of the aspects of sentence structure they had studied, students worked through the latter part of Chapter 7 and Chapter 8 in *Learning English* (1963). This was the only text that the students in this experimental course had, but they were also given material on mimeographed sheets, some adapted from other texts such as Warriner's *English Grammar and Composition* (1977), and some developed by the researcher.

Because the researcher wished to determine how well the experimental group had understood the grammatical concepts and terminology which they had studied, this group was given, in June, a comprehensive examination which required them to demonstrate both analyzing and synthesizing skills. The examination required students to do a considerable amount of writing, and took much longer than the instructor had anticipated. As a result, it was necessary to shorten some of the sections of the paper, and to omit one or two others. The papers were evaluated out of 100 (with over half of the marks for the sections dealing with syntax) by the English Department marker, who was fully qualified, having a B.A. with a major in English, and ten years' experience in marking secondary English. The grammar exam, and the results may be seen in Appendix E.

The marks were not high, considering that the mean I.Q. of the experimental group was 109, but not too surprising when the following factors were taken into account:
1. Of the three students who failed, one had a very low ability, and was not expected to pass the same type of exam as the rest of the class; another had missed almost one-quarter of her classes during the year.

2. The exam was too long, and fatigue was certainly a consideration.

3. Students had to review the year's work on their own, as there was not time in class for this purpose. This task proved difficult for pupils accustomed to the shorter tests given at the end of each unit in the continuous evaluation system.

4. As mentioned above, time was a really pressing concern with the experimental class. As a result, after the grammatical concepts and terminology had been taught, there was less time than expected for the students to spend on the manipulation of sentence structure.

Regular Curriculum

In the other three periods each week, classes met in middle groups, where all classes studied the same course material in literature, language, and composition.
Literature

Work in the fall term began with the study of ten short stories, taken primarily from *Eighteen Stories* (1965). Varying aspects of these stories, such as plot, character, theme, point of view, or setting were discussed. Following the unit on short stories, three novels were studied in turn: *The Chrysalids*, *Animal Farm*, and *To Kill a Mockingbird*. The last of these was completed by approximately the end of January, at which time classes began a unit on mythology. This subject was new to the grade ten course this year, and most of the students seemed to enjoy it. Most of the work was oral, as students had a choice of doing a major written project or an oral presentation. Books used in this unit included three or four texts and thirty or forty reference books from the school library which were placed on reserve so as to be available for student research.

After the completion of the work on myths, students began the study of *Julius Caesar*, and when this was completed, continued with a unit on non-fiction, including *Hiroshima* and selections from *Man in the Expository Mode*. This work was followed by a study of poetry from *Poetry: An Anthology for Secondary Schools*, and the new text, *Imagine Seeing You Here*.

Language

Language study during the year included:
1. A unit on spelling, and the building of vocabulary through a study of prefixes and suffixes.

2. A unit on the history of the language and the history of writing.

3. A unit on the levels of language which stressed the difference between the informality of spoken English and the formality of written English.

4. A unit on the advantages of specific, concrete words over abstract, general ones, in improving the picture-making quality of writing. Denotation and connotation of words and the use of euphemisms were included here.

Composition

Free writing, as described above, was largely done in small group assignments. In middle groups, writing in all modes was primarily associated with the study of literature. Examples of the types of assignments might include:

1. A description of Paul in "Paul's Case" (Eighteen Stories).

2. A version of "Mr. Know All" from Max Kelada's point of view (Eighteen Stories).


4. An imaginary account in which you are Scout, writing to Dill of the exciting adventure that leads to your meeting with the "Grey Ghost" (To Kill A Mockingbird).
5. Trace, in a series of steps, the ways in which the ideal society inaugurated by Old Major was gradually turned into a totalitarian regime and discuss the central irony implicit in this change (*Animal Farm*).

Assignments in middle group varied from one to three pages in length, and were handed in for marking probably on an average of once every two weeks. No work on grammar, usage, punctuation, capitalization, or any phase of sentence structure was discussed in middle group classes. Work from Chapters 2 and 12 in *Learning English* on building paragraphs and building longer compositions, which included the writing of reports, of summaries, of reviews, the organizing of material into an outline, and other facets of writing was studied.

**Text Books**

A list of the texts, mentioned above, that were used in the regular curriculum of the grade ten students is included here.

**Literature Texts** (in the order referred to above):


*The Chrysalids*, by John Wyndham (House of Grant (Canada) Ltd., 1965).


*To Kill a Mockingbird*, by Harper Lee (McClelland and Stewart Ltd., Toronto, 1960).

Comparative Mythology, by Marion Ralston (D.C. Heath Canada Ltd., Toronto, 1974).


Mythology, by Edith Hamilton (The New American Library, Toronto, 1940).


Drama IV (Julius Caesar) ed., by Herman Voaden (MacMillan Co. of Canada, Toronto, 1965).


Language and Composition Texts:


The Language of Man II and III, (McDougal, Littell, 1972).


Measurement

Ability. The students' ability was measured by the Beta Test: Form EM, Otis Quick-Scoring Mental Ability Tests: New Edition (I.Q. scores, mean 100), and by the letter grade which represented the student's achievement in English for the previous terms.

Syntactic Maturity: Sample Size. In order to measure the syntactic maturity of students' free writing, it was necessary for the researcher to obtain a representative sample of that writing. Studies had shown that a writer's performance could vary because of day-to-day fluctuations and because of the mode of discourse. Braddock (1963) summarized the research of Kincaid (1953), who discovered that the writing of college freshmen, especially that of the better writers, varied from day to day. O'Hare referred to the work of Anderson (1960), who found that the grade eight students whom he tested on eight different occasions showed sufficient evidence of fluctuation in their writing for him to conclude that a writer variable must be taken into account when rating compositions for research purposes. In Kincaid's study, he also noted that specific aspects of structure, like length and complexity of clause, were related to the mode of discourse. In this respect, his findings were similar to those of Johnson (1967) who examined the writing of elementary students. Seegers, as early as 1933, showed that mode of discourse was
related to syntax, and Hunt (1964) pointed out that the writer's sentence structure was affected by the type of writing he was doing. A more recent study, by Veal and Tillman (1971) examined the similarities and differences in the rated quality of compositions written in four modes: descriptive, narrative, expository, and argumentative, at three elementary grade levels. They found that the biggest differences between grade levels occurred in the expository and narrative modes. Research thus indicated that samples of students' writing should include more than one type of discourse, as well as a variety of topics, to be written at different times.

In attempting to discover an ideal sample size, the present researcher noted that other researchers had come to varying conclusions. Chotlas (1944) found that 1000-word samples written by junior high students were as effective as 2000-word samples. O'Donnell and Hunt (1970) used a 300-word sample of the writing of fourth graders. Mellon's examination of 90 T-Units gave him a 1000-word sample for each test time (Hunt had found that the average length of T-Unit for grade eight students was eleven words). O'Hare examined 50 T-Units, and this gave him approximately 500-word samples at each test time. Combs used a 300-word sample, stating that Hunt and O'Donnell had suggested this size as a minimum (1970). Mellon's and O'Hare's samples were taken from the three modes of discourse: narrative, descriptive, and expository, but Combs used only the narrative and descriptive modes.
In the present study, it was decided to give three pre-test, and three post-test compositions, also in parallel form, one in each of the three modes, and to examine the first ten T-Units of each. Length of T-Units and of clauses in the three pre-test compositions were averaged, as were the scores on these indices in the three post-test compositions. In following this practice the researcher was replicating the procedures of Mellon, O'Hare, and Combs. Such methods yielded a writing sample of at least 350 words at each test time. In addition, O'Donnell's Aluminum passage was given at pre- and post-test times. All pre- and post-test writing was done in class in order to ensure that students were not assisted. No attempt was made to influence the students' efforts; neither sentence structure nor any other aspect of his writing was stressed. Composition topics, in A and B forms, may be seen in Appendix F.

**Rules for Analysis**

O'Hare explained a number of the rules he used to segment each student's writing into T-Units, and as the present researcher followed these procedures, a brief summary of them might be appropriate here. Fragments which resulted from the omission of a word counted as a T-Unit, as the researcher supplied the missing word; other fragments were discarded. Unintelligible strings of words, referred to by Hunt (1965, p. 6) and O'Donnell et al., (1967, p. 39) as "garbles" were discarded. In segmenting direct
discourse, O'Hare counted the first expression after the speaker tag (he said) as a direct object (noun clause), but any further T-Units after this first expression were segmented as separate T-Units:

In her soft gentle voice Marsha said, 'I really like you, John. | However, Clarence's father is a millionaire | and I like the idea of Palm Beach.

In this procedure O'Hare differed from Mellon, who discarded speaker tags. Very little direct discourse was used by the Grade 10 students in this study, but if it was, the researcher followed O'Hare's method in this and in the counting of clauses. In the latter process, both O'Hare and Mellon used Hunt's technique:

In counting the number of clauses in the present writings, a clause was taken to be a structure with a subject and a finite verb. If subjects were coordinated, they merely lengthened the clause, as did coordinated verbs. (p. 15)

Words per T-Unit were obtained by dividing the number of words by the number of T-Units. The counting of words followed the format set by O'Hare in that compound nouns written as one word counted as one word. Compound nouns written as two words and hyphenated word pairs counted as two words. Dates like April 2 counted as two words, as did contractions such as "shouldn't." Words per clause were found by dividing the number of words by the number of subordinate and main clauses.
Choices of Indices

The number of indices used by Mellon, O'Hare, and Combs to calculate syntactic maturity varied: Mellon used twelve, O'Hare six, and Combs, two (words per T-Unit and words per clause). Hunt had found these two were the most discriminating measures of syntactic maturity, and O'Donnell had confirmed his findings. Hunt's (1965) findings had shown that the subordination ratio was the third best measure, but in his 1970 study, he found that subordination reached a plateau by grade eight, and that writers, as they matured, increasingly consolidated sentences to "less than a predicate or less than a clause." This being so, the present researcher, who was dealing with Grade 10 writing, decided against using the subordination ratio, particularly as Hunt had found that T-Unit length correlated significantly with the number of adjective clauses.

In an effort to determine which indices would be most appropriate for the present study, the researcher re-examined Hunt's data, and noted that he had found a second significant trend to be the increased use of noun clauses in older writers, who did not use noun clauses in direct discourse, as younger writers did, but as objects of verbs like "say." The use of noun clauses increased from 170 in Grade 4 to 290 in Grade 12. However, Hunt added that though there were too few to be tested statistically, he suspected that those noun clauses which did not function as objects of the above type of verbs, but served instead as subjects, complements,
or objects of prepositions might be one of the best indices of maturity, as the use of these constructions increased markedly, from 16 in Grade 4 to 45 in Grade 8, to 63 in Grade 12.

Hunt also determined the older writers used more non-clause modifiers of nouns, and that average clause length correlated significantly with these noun modifiers. Further, he noted that the use of three near-clause nominals, infinitives, gerunds, and non-restrictive appositives, increased substantially with grade level (119 in Grade 4, 162 in Grade 8, and 289 in Grade 12), and that these "near clause" nominals were more distinctly indicative of maturity than noun clauses. In fact, use of the gerund increased more dramatically from grade to grade than any other structure. Hunt's data showed that clause length correlated significantly with the number of gerunds (.666) and T-Unit length correlated significantly with the number of infinitive nominals (.368). As gerunds, infinitives, and participles were structures Potter had also found to be much more prevalent in the compositions of good writers, the researcher had contemplated a count of these verbal forms as a measure of syntactic maturity, but there appeared to be good evidence that T-Unit length and clause length would measure the frequency with which these structures were used.

Hunt also found that older writers had greater "complexity" of nominals and he believed that this complexity count could be one of the best indices of maturity. Again his findings coincided with Potter's, as Potter noted that in the compositions of the good
writers the complexity of nominals (particularly of objects) was much greater than in those of the poor writers. Hunt's findings, moreover, showed that a complexity count measured factors which were directly related to the process of lengthening T-Units. In his very comprehensive study, Hunt also analyzed the use of verb auxiliaries and found that the use of passives increased significantly in the upper grades, a development Potter had noted when he found more passives were used by mature writers. Hunt's statistics indicated that for all students, clause length correlated significantly with the use of passives.

A summary of Hunt's findings would thus show that the most significant indications of growth between grade levels were: the use of adjective clauses; the use of noun clauses in positions other than objects of verbs like "said"; non-clause modifiers of nouns; near-clause nominals, and passives. According to Hunt's results, all of these factors related significantly to T-Unit length and clause length. Therefore, the researcher decided that these two indices would be adequate for her purpose.

Writing Quality

Other Studies

A review of the methods used in earlier studies to compare the quality of writing in the control and experimental groups revealed certain facts:
1. Because of the limited resources for marking great numbers of papers, only a small sample of the compositions written by each group were compared; in Mellon's study this comprised 8% of the total, in O'Hare's about 7%, and in Combs about 20%. Combs's students, however, wrote far fewer compositions, a total of 400, in comparison to 4,446 for Mellon, and 830 for O'Hare.

2. In these three studies, quality of composition was judged by a number of well-qualified and experienced teachers (6 for Mellon, 8 for O'Hare, and 7 for Combs), each of whom was instructed to use the rapid-reading technique suggested by Noyes (1963), and employed by the College Entrance Examination Board. Braddock (1963) stated that:

The two principal means of seeking valid and reliable ratings despite the colleague variable are the 'general impression' method of rating compositions and the 'analytic method.' In the general impression method, a number of raters, working independently, quickly read and rate each composition, the mean of their ratings being used as the final rating of each paper. According to Wiseman's procedure . . . 'keeping up a rate of about 50 per hour' to insure that he makes up his mind quickly. (p. 12)

In discussing the analytic method, Braddock stated that it might be more effective in reducing colleague variable for the argumentative papers of older students, but that it was more time-consuming, and more expensive, considerations of considerable importance to most researchers.
3. Raters for Mellon and O'Hare were asked to base their judgments equally on five factors: ideas, organization, style, sentence structure, and vocabulary. Procedures were standardized during an initial practice session, as Buxton (1958) claimed that rater training helped rater reliability. Buxton stated that graders should review together a composition they had just rated to insure a common interpretation of their criteria. Braddock remarked on the frequency with which rater training was reported in studies which reported high reliabilities. (p. 14) Mellon selected 35 students by random draw from each of his three treatment groups at only the high average and average level, and selected two compositions per test (pre and post) for each student. Using a 1 to 5 rating scale, three markers evaluated one of the two compositions, and the other three judged the second. Thus each student had six ratings, which were summed, for each test time, with scores ranging from 6 to 30. These methods appeared to be more comprehensive than the "forced choice between matched pairs" design used by O'Hare, or the expansion of O'Hare's design used by Combs, but Mellon had more funds available, as he was working on a government research grant.

4. All compositions that were evaluated for writing quality were first typed, usually by a school secretary also unaware of the experiment, who corrected spelling and punctuation.
Mellon simply stated:

These compositions were typewritten so that spelling and punctuation errors could be corrected, and author and group identification omitted.

O'Hare commented that his study:

... was interested in the students' writing ability and not at all in their spelling, punctuation, or handwriting talents. In order to eliminate the possible effects of these extraneous factors on the evaluators' judgments, the thirty pairs of compositions were typewritten so that spelling and punctuation could be corrected.

In support of his position, he quoted Braddock:

Even though raters are requested to consider in their evaluations such attributes as content and organization, they may permit their impressions of the grammar and mechanics of the composition to create a halo effect which suffuses their general reactions. (A converse emphasis, of course, can just as easily create the halo). (p. 14)

Braddock also wrote of similar halo effects being reported by both Starring (1952) and by Diedrich, French, and Carlton (1961), and on pp. 49-50, in a discussion of the factors that contributed to making a good composition, Braddock argued that:

However important accurate spelling may be in the clarity and social acceptability of composition, many of the factors of good spelling do not seem to be closely involved with the factors of good composition.

One might argue that the samples for comparison of writing quality were too small, or that Mellon's raters, using a 1-5 rating
scale, might have examined the papers more closely, and though they examined only 8% of the corpus, this percentage represented considerably more papers (420) than did O'Hare's 7% (60), or Combs 20% (88). In any case, the evidence was surely not conclusive in any of these studies, as each of these researchers was principally concerned with establishing gains in syntactic maturity. The effort to see whether these gains were reflected in the overall quality of the writing seemed to be a secondary consideration.

O'Hare and Combs both reported that their raters found that the syntactic gains of the experimental groups were reflected in the quality of their writing, but in these results a number of variables should be considered. Both used the "matched pairs" design, and thus no quantifiable mark was assigned to the compositions being judged. As a result no mean scores could be calculated, and no F-ratios or probability levels computed. However, this lack of statistical evidence was not as important as the interpretation by the raters of the term "quality." Combs inferred from O'Hare's procedure "that the design measured a specific aspect of writing quality, ease or efficiency of (syntactic) expression." As a result Combs asked his markers to make "a holistic judgment of ease of expression." (p. 141) This statement seemed to imply that smoothness of sentence structure was more important than the other four criteria. If this were so, then the gains in syntactic maturity of the experimental groups should enable them to write a better "quality" of compositions than the control group.
Present Study

In order to compare the quality of the compositions written by the experimental group with those of the control group, the researcher adopted O'Hare's method of having raters make a forced choice between matched pairs of compositions by simply indicating which of the two was better. This method was not considered ideal, but a less time-consuming process than the use of some sort of ordinal scale, such as a letter grade or a 1 to 5 scale, when no funds were available to pay markers. Members of the control group were listed and numbered in ascending order of I.Q. for both boys and girls. A similar list was completed for the experimental group. A subject was randomly chosen from the control group, and a subject of the same sex and approximately equal I.Q. (within five points) and writing ability was chosen from the experimental group to make up a pair. This random pairing resulted in 27 pairs.

Although the students had written three pre-treatment and three post-treatment compositions, the researcher again decided to follow O'Hare's example and use only the post-treatment compositions when comparing the writing quality of the two groups, as it was the writing done at the end of the experiment that was of primary interest to the investigator. In the present study, it was decided to use compositions in the descriptive and the expository modes, as these were the ones favoured by the Grade 10's. The matched pairs of subjects were divided into two sets, with thirteen pairs in one
and fourteen pairs in the other. Pairs of subjects were assigned to these two sets in a manner which would give approximately equal numbers of the same sex and ability level to each group. Thus fifty-four compositions were collected in all, twenty-eight in the descriptive, forming fourteen of the pairs, and twenty-six in the expository, forming the other thirteen pairs.

The evaluators were nine English teachers, all of whom had excellent qualifications and experience (see Appendix C), and none of whom had any knowledge of the research in progress. These teachers were asked to make a single intuitive judgment of the overall quality of the compositions, basing their decision equally upon the five criteria of ideas, organization, style, sentence structure, and vocabulary. No emphasis was laid upon any one factor. The teachers met in the English offices before beginning the marking, and there followed a brief discussion of the relative merits of two sample pairs of compositions, one pair exemplifying good writing and the other exemplifying poor writing. In an effort to establish some common understanding of the criteria, raters agreed that the assessment of (1) ideas would be by the reasoning or imagining that had gone into them, (2) organization by the order and clarity with which ideas had been put together, (3) style by the way in which the writer had captured the attention of the reader, (4) sentences by the fluency of expression, and the avoidance of fragments, run-on or short, choppy structures, or complicated, unclear constructions, and (5) diction by the suitability of vocabulary to subject.
Teachers were urged to read rapidly, keeping the five criteria in mind as they placed a check at the top of the paper in each pair which they judged to be superior. Follman and Anderson (1967) and Marzano (1975) had shown that the holistic method of marking could produce a high degree of reliability. The markers were each given a folder containing twenty-seven pairs of numbered compositions, stapled together. Each marker received his set of papers assembled in a different order, so that it would not be possible to compare judgments. In fact, they were specifically asked not to discuss their evaluations with each other, and a coding system was used in order that the teachers had no idea to which group any composition belonged. A paper could score between 0 and 9, depending upon how many of the markers chose it as the better. Before the marking commenced, the researcher had followed the practice of Mellon, O'Hare, Potter, and Combs in having the pairs of compositions typed by the school secretary. The spelling was corrected, but the punctuation was not, as it was thought that this might alter the sentence structure, and influence the judgment of the markers.

In hypothesizing that the quality of writing, as well as the maturity of sentence structure, could be enhanced as efficiently by a study of grammar as by a sentence-combining approach, the researcher had to consider how to keep the control group's sentence combining and writing workshops free of the influence of grammar. This was really not difficult, as no grammatical terminology was used in the text, Sentencecraft, and in the marking of
written assignments, the marker limited herself, as mentioned earlier, to a general comment on the quality, originality, ingenuity, or humour of the work. Similarly, in marking written work assigned in middle group classes where the regular curriculum of Grade 10 was carried on, the researcher made no reference to sentence structure; instead emphasis was placed on ideas, organization, and diction.
CHAPTER 3

RESULTS AND ANALYSIS

Assessment of Syntactic Maturity

A major part of the results of the present study has been shown in Table I, which represents the mean scores of two dependent measures, T-Unit Length and Clause Length, obtained from students' own compositions (free writing), and from their revision of the Aluminum passage. The free writing was examined first, and an analysis of covariance was performed on the words per T-Unit scores obtained in the 2 (Experimental versus Control) x 2 (Repeated measures: Pre- versus Post-tests) design with English marks and I.Q. scores as covariates. The results of the analysis are presented in Appendix A.

The most important question in the present study was whether or not the experimental-grammar group had achieved greater gains in syntactic maturity, as measured first in terms of T-Unit length, than did the sentence-combining control group. Since there was no reason why pre-test scores of both groups should differ, statistical evidence was sought by examining the interaction effect between the two treatment groups and the time of testing (pre- and
<table>
<thead>
<tr>
<th>Indices</th>
<th>Free Writing</th>
<th>Aluminum Passage</th>
<th>I.Q.</th>
<th>English Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T-Unit</td>
<td>Clause Length</td>
<td>T-Unit</td>
<td>Clause Length</td>
</tr>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Time of Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>12.77</td>
<td>14.42</td>
<td>9.47</td>
<td>9.97</td>
</tr>
<tr>
<td>Post</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>12.26</td>
<td>16.74</td>
<td>8.78</td>
<td>10.35</td>
</tr>
<tr>
<td>Post</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>12.20</td>
<td>17.07</td>
<td>8.74</td>
<td>10.56</td>
</tr>
<tr>
<td>Post</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R. = Raw Scores
A. = Adjusted Scores
As could be seen in Appendix A, there was significant interaction effect between the two, $F(1, 49) = 12.50, p < .001$. This meant that the differential gains of the control students were significantly greater than those of the experimental group, i.e., 4.87 versus 1.67 words per T-Unit. These results were diametrically opposed to what was expected from the hypothesized role of the experimental-grammar group. It should be noted here that English achievement scores did account for some of the variation in T-Unit length scores, $F(1, 47) = 4.82, p < .033$ (Beta weight = .31) and that I.Q. scores did also, but to a lesser degree, $F(1, 27) = 3.22, p < .08$ (Beta weight .08).

In order to compare the syntactic gains of the two groups on the words per clause index in their free writing, a second analysis of covariance, using the 2 x 2 matrix and the same two covariates, was carried out. The results of this analysis, found in Appendix B, indicated that the interaction between the two groups and the time of testing, $F(1, 49) = 4.60, p < .037$ was significant. This meant that the control subjects differential gains were again greater than those of the experimental group (1.82 versus .48 on the words per clause scores). Thus the differential gains of the grammar study group were significantly less on both indices, T-Unit and Clause length, than the control group, contrary to the expectations of the researcher. English achievement scores did account for some of difference in clause length scores,
\( F(1, 47) = 8.19, p < .006 \) (Beta weight = .28), but I.Q. scores, 
\( F(1, 47) = 2.11, p < .153 \) (Beta weight .04) did not.

In the writing of the Aluminum passage, the interaction effect between the two treatment groups and the time of testing on the words per T-Unit index, shown in Appendix C, indicated that there was significant interaction effect between the two, 
\( F(1, 49) = 14.81, p < .001 \). Thus the differential gains of the sentence-combining control group were significantly greater than the experimental group (5.88 versus 1.96) in T-Unit length scores. It was apparent that the trend established in the free writing, where the gains of the control group were significantly greater than those of the experimental group, was repeated in the Aluminum writing. English achievement scores, 
\( F(1, 47) = .002, p < .97 \) (Beta weight .007) would not affect the results, but I.Q. scores, 
\( F(1, 47) = 8.46, p < .006 \) (Beta weight .14) would.

A fourth analysis of covariance, found in Appendix D, showed that there was significant interaction between the two treatment groups and the time of testing on the words per clause index in the writing of the Aluminum passage. The interaction effect, 
\( F(1, 49) = 2.50, p < .120 \) demonstrated that the differential gains of the control group were not reliably superior to those of the experimental group (1.24 versus .51). Once again the expectations hypothesized for the grammar group did not materialize. The English achievement scores, 
\( F(1, 47) = .28, p < .60 \) (Beta weight -.03) did not significantly affect the results nor did the I.Q. scores, 
\( F(1, 47) = .78, p < .38 \) (Beta weight .02).
The analysis of the data thus indicated that the null hypothesis, assuming no difference between the two groups, had to be rejected, as there was significant difference between the two groups. However, this difference proved to be in the opposite direction from that hypothesized, i.e., the significant gains were made by the control group rather than by the experimental group.

Assessment of Writing Quality

The next consideration in the analyses of data was to test the second hypothesis: that the experimental group would write compositions that would be judged by a group of experienced English teachers to be better in overall quality than those written by the control group. In order to carry out this test fourteen expository and thirteen descriptive compositions were selected from both the control and experimental groups and paired as described above.

Judgments of overall quality of writing could be analyzed in terms of the number of times an experimental or a control composition was chosen from a matched pair, regardless of which teachers had chosen it, as shown in Section A-1 and A-2 of Table II. The judgments could also be analyzed in relation to the total number of times each marker had chosen either experimental or control compositions to be superior, without accounting for the specific pairs of compositions from which the choices were made, as shown in Sections B-1 and B-2 of Table II.
TABLE II
Experimental or Control Compositions Chosen by Nine Experienced English Teachers

Section A
From Fourteen Matched Pairs of Expository Compositions

| Teachers' Choices | Composition Pair No. | | |
|-----|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| Experimental | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Control | 1 | 6 | 7 | 6 | 2 | 7 | 1 | 6 | 4 | 1 | 4 | 3 | 4 | 0 |
| Sign (E-C) | + | - | - | - | + | + | + | + | + | + | + | + | + | + |
| N = 14 | r = 5 |

From Thirteen Matched Pairs of Descriptive Compositions

| Teachers' Choices | Composition Pair No. | | |
|-----|---------------------|---|---|---|---|---|---|---|---|---|---|
| Experimental | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Control | 5 | 3 | 6 | 6 | 4 | 3 | 2 | 2 | 4 | 5 | 7 | 9 | 7 |
| Sign (E-C) | - | + | - | - | + | + | + | + | + | + | - | - | - |
| N = 13 | r = 6 |

Section B
A Summary of Markers' Choices in Each Mode

<table>
<thead>
<tr>
<th>Marker</th>
<th>1 Expository</th>
<th>Experimental</th>
<th>Control</th>
<th>Sign</th>
<th>2 Descriptive</th>
<th>Experimental</th>
<th>Control</th>
<th>Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>4</td>
<td>+</td>
<td></td>
<td>6</td>
<td>7</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>6</td>
<td>+</td>
<td></td>
<td>6</td>
<td>7</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>5</td>
<td>+</td>
<td></td>
<td>6</td>
<td>7</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>6</td>
<td>+</td>
<td></td>
<td>4</td>
<td>9</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>6</td>
<td>+</td>
<td></td>
<td>10</td>
<td>3</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>8</td>
<td>-</td>
<td></td>
<td>10</td>
<td>3</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>9</td>
<td>5</td>
<td>+</td>
<td></td>
<td>8</td>
<td>5</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>5</td>
<td>+</td>
<td></td>
<td>3</td>
<td>10</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>7</td>
<td>+</td>
<td></td>
<td>1</td>
<td>12</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>N = 14</td>
<td>74</td>
<td>52</td>
<td>r = 1</td>
<td></td>
<td>N = 13 54</td>
<td>63</td>
<td>r = 3</td>
<td></td>
</tr>
</tbody>
</table>
Section A-1 of Table II showed that markers assessing the 14 pairs of expository compositions chose 74 of the experimental and 52 of the control compositions. In order to determine whether this difference was significant, a sign test was used. The number of pairs of observations was represented by "r" and the "sign" was the difference, shown by a plus or a minus, between the measurements made upon the two treatments, experimental and control. The symbol "r" was used to denote the number of times the less frequent sign occurred. The null hypothesis here was that each difference had a probability distribution with median 0. Results of the sign test showed that the observed "r" equalled 5, which, according to the table giving the critical values of "r" (see Appendix J) was not significant, as the required "r" at p < .05 level, was 2.

Section A-2 of Table II indicated that the markers judging 13 pairs of descriptive compositions selected 63 control and 54 experimental compositions. When the sign test was applied here, the observed "r" was found to be 6, which was also not significant at p < .05 level.

In a similar manner a sign test was performed on Section B-1. Although experimental compositions were chosen as superior by seven out of the nine teachers, these choices of experimental compositions did not appear to be significantly superior at p < .05.
level (required "r" = 0, observed "r" = 1). Another sign test was carried out with Section B-2 data, the results of which showed no significant difference between the choices of experimental and control compositions (required "r" = 0, observed "r" = 3).

Summary

A. Analysis of the Data on the Two Indices of Syntactic Maturity:

1. In both the free writing and the revision of the Aluminum passage, there were significant differences, at the .001 level, between the mean change scores in T-Unit length of the control group and the experimental group. The sentence-combining control group had significantly greater growth than the experimental group.

2. On the words per clause index, the growth in syntactic maturity of the control group was significantly greater, at the .04 level, than that of the experimental group.

B. Analysis of the Data on the Quality of the Writing Sample Judged by Nine Markers Showed:

1. There were some differences between the markers' choices in the two modes, as they judged the experimental compositions superior in the expository mode, and the control superior in the descriptive mode.
2. When sign tests were used to test the differences between the number of times an experimental or a control composition was chosen from a matched pair, the observed "r" was not significant at $p < .05$ level.

Similarly, when the data was analyzed to test the difference between the total number of times each marker had selected either an experimental or control composition, this difference was not significant at $p < .05$ level.
CHAPTER 4

CONCLUSIONS AND IMPLICATIONS

The present research was designed to test whether a study of certain aspects of traditional grammar could be as effective in increasing the normal rate of growth of syntactic maturity in the free writing of grade ten students as the non-grammatical sentence-combining approach advocated by O'Hare. To do this, two small-group control classes having 29 pupils, and two small group experimental classes having 27 students, were used. The experimental group was concerned primarily with those aspects of sentence structure which Hunt (1965) and Potter (1967) had documented as being characteristic of the writing of better students. The control group used the text *Sentencecraft*, with its expanded program of sentence-combining devised by O'Hare.

Both groups followed the same curriculum in regular classes, and in the small groups, the grammar-study class did exactly the same amount of free writing, based upon the "Writing Workshops" in O'Hare's text, as did the sentence-combining class. Specifically, the present study sought the answer to two questions. Would the experimental group, with its study of sentence structure (1) be able
to show more growth in syntactic maturity in their free writing than the control group and (2) be able to write compositions that would be judged superior in overall quality to those of the control group?

Conclusions

As a result of the analyses presented in Chapter 3, it was concluded that the role hypothesized for the experimental grammar group, that it would achieve greater growth in syntactic maturity than the control group, was not fulfilled. Contrary to the expectations of the researcher, the sentence-combining control group wrote significantly longer clauses, and as a result, longer T-Units, than did the experimental group.

When nine experienced English teachers were asked to judge the overall writing quality of fourteen pairs of experimental and control compositions written in the expository mode, they chose more of the experimental than the control compositions. However, when they evaluated thirteen pairs of descriptive compositions, the markers selected more of the control papers. The differences in choices, however, did not appear to be significant in either mode, and as a result the null hypothesis could not be rejected.
Discussion of Conclusions

Syntactic Maturity

In hypothesizing that the experimental grammar group would achieve more growth in syntactic maturity than the sentence-combining control group, the present researcher's expectations were the opposite of those of O'Hare and Combs, both of whom had sought to prove that the practice of sentence-combining would significantly increase the ability of their experimental class to manipulate sentence structure. Mellon's hypothesis had been similar, except that he had taught his experimental group the nomenclature of transformational grammar in order that the students would understand the grammatical signals used in his sentence-combining problems. O'Hare speculated that the reason that Mellon's gains were considerably less than his own was because of their grammar study. O'Hare, and Combs after him, did not have their experimental or control groups study any kind of grammar, but Mellon's control group studied traditional grammar.

The data presented in Chapter 3 indicated that the present study confirmed the findings of its predecessors in that the experimental-grammar group did not succeed in achieving greater growth in syntactic maturity than did the control group. Section A of Table III indicated that in the free writing, the gains of 4.87 words per T-Unit for the control group were considerably higher than those
TABLE III

Comparative Data From Other Studies

Section A

Comparison of Pre- and Post-Treatment Change Scores of the Sentence-Combining and Non-Sentence-Combining Groups of Mellon, O'Hare, Combs, and the Present Study on One Index of Syntactic Maturity: Words/T-Unit

<table>
<thead>
<tr>
<th>Study &amp; Grade</th>
<th>Program* &amp; Group</th>
<th>Sentence-Combining</th>
<th>Non-Sentence-Combining</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre-Test</td>
<td>Post-Test</td>
</tr>
<tr>
<td>Mellon 7 SC-Exp.</td>
<td>9.98</td>
<td>11.25</td>
<td>Grm. - Con.</td>
</tr>
<tr>
<td>O'Hare 7 SC-Exp.</td>
<td>9.63</td>
<td>15.75</td>
<td>No Grm.- Con.</td>
</tr>
<tr>
<td>Combs 7 SC-Exp.</td>
<td>9.48</td>
<td>11.65</td>
<td>No. Grm.- Con.</td>
</tr>
<tr>
<td>Present 10 SC-Con.</td>
<td>12.20</td>
<td>17.07</td>
<td>Grm. - Exp.</td>
</tr>
</tbody>
</table>

*SC = Sentence Combining, Exp. = Experimental, Grm. = Grammar, Con. = Control

Section B

Hunt's Data on Normal Growth in Free Writing and in the Rewriting of the Aluminum Passage for Two Indices of Syntactic Maturity: Words/T-Unit and Words/Clause

<table>
<thead>
<tr>
<th>Grade</th>
<th>Free Writing</th>
<th>Aluminum Passage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T-Unit</td>
<td>Clause Length</td>
</tr>
<tr>
<td>4</td>
<td>8.51</td>
<td>6.6</td>
</tr>
<tr>
<td>6</td>
<td>6.84</td>
<td>5.76</td>
</tr>
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<td>8</td>
<td>11.34</td>
<td>8.1</td>
</tr>
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<td>10</td>
<td>14.4</td>
<td>8.6</td>
</tr>
<tr>
<td>12</td>
<td>14.4</td>
<td>8.6</td>
</tr>
<tr>
<td>Average Adult</td>
<td>11.85</td>
<td>8.40</td>
</tr>
<tr>
<td>Superior Adult</td>
<td>20.3</td>
<td>11.5</td>
</tr>
</tbody>
</table>
of Mellon's or Combs' subjects, but not quite as high as O'Hare's. Table I in the previous chapter had indicated that in their free writing, the post-test score of the present control group on words per T-Unit was 17.07, and on words per clause, 10.56. According to Hunt's data shown in Section B of Table III, these scores were not far from the level of superior adults. Similarly, on their writing of the Aluminum passage, the control group's post-test scores on T-Unit length (16.49) placed them beyond the level of superior adults, and clause length (8.59) put them between average and superior adults.

In comparison to the control group, the gains in syntactic maturity of the experimental group seemed non-significant, but in contrast to other studies (Table III, Section A) they did not appear to be. Their gain of 1.67 words per T-Unit in their free writing compared favourably with the gain of 1.27 words for Mellon's experimental group, which he had found significant at the .01 level. When data from Table I was compared to Hunt's tables, shown in Section B of Table III, the present experimental group's gain of .48 words per clause in their free writing was considerable, as Hunt indicated only a .5 change between grade eight and grade twelve. Their post-test scores on their free writing (T-Unit, 14.40; clause length, 9.96) placed them, according to Hunt's data, at the grade twelve level on words per T-Unit, and well above it in clause length. On the aluminum passage post-test scores on both indices (T-Unit, 13.48, clause length, 8.05) put them at the level of average adults.
The question of why the present study's grammar group had had only one-third of the syntactic gains of the control group was discussed in Chapter Two, where the researcher concluded that, although there was no direct evidence, she believed that the explanation lay, in part, in the fact that the scope of the study was too broad. Too much time had to be spent in learning grammatical terminology, and not enough time remained to practise the many aspects of grammatical sentence-combining (as opposed to O'Hare's "non-grammatical" approach) that might have increased the grammar group's gains in syntactic maturity.

**Quality of Writing**

The results of a comparison of the writing quality of the two groups posed the rather interesting problem of why the sentence-combining control group, having achieved significant differential gains in syntactic maturity, did not write better compositions than the experimental group. In an effort to answer this question, a number of possible explanations were examined.

1. **Lack of Emphasis on Sentence Structure.** Any attempt to discover why syntactic maturity was not a more significant factor in identifying the quality of writing must take into consideration the fact that no special virtue was ever attached to the ability to write complex sentences. Students in the control class did indeed
solve many sentence-combining problems by writing sentences of considerable length and complexity, but this activity was, to all intents and purposes, carried on in an "A-rhetorical" setting, for even though a program of free writing was undertaken in conjunction with the small group work, the latter was done out of class, and students were never admonished to practise their sentence-combining when writing their compositions. The class regarded sentence-combining more as a challenge to their ingenuity, a rather enjoyable exercise quite divorced from the process of writing. Although there was thus no conscious transfer of sentence-combining techniques to the writing process, it was obvious that enough had "rubbed off" for students to use longer T-Units and clauses in their post-test compositions. In these, however, there was no evidence, as Mellon (1969) put it, of "strained, garbled, or otherwise tortured sentence structure peculiar to the experimental group." (p. 69), as there might have been had they attached any particular importance to the complexity of sentence structure.

2. Variation in T-Units. Further evidence that the students had no undue concern about the manipulation of syntax was evident when T-Unit length was counted in the pre- and post-test compositions. Some of the most able writers in each group were quite unpredictable insofar as T-Unit length was concerned. One boy in the sentence-combining class had a pre-test mean score of 20.3 and a post-test mean of 17.9, while another, in the grammar
group, had a negative change from 25.7 to 16.8 words per T-Unit. In both instances their post-test writing was excellent, and had it been compared to their pre-test, it would almost certainly have been judged superior. In addition, a boy in the experimental group, whose writing ability was superior to most of the other students, averaged 16.8 words per T-Unit in his post-test compositions, but this was a mean of three scores ranging from 9.7 to 22.8, which were taken from papers of equally fine quality. With this student and many others, T-Unit length was suited to the ideas and attitude they wished to convey. This particular boy, in revising the aluminum passage, reduced the material to 66 words from a total of 139, leaving out no salient information. In doing so, he used seven T-Units, giving him an average of 9.6 words, yet his version was much more succinct than those in which the data had been combined into four or five T-Units of greater length and complexity. On the other hand, two students who had a great deal of difficulty in expressing themselves clearly, had an average of 18.1 and 15.5 words per T-Unit in their post-test writing, in which the sentences were convoluted and the meaning unclear. This did not mean that sentence-combining caused the lack of clarity, for those boys wrote long, complicated T-Units in their pre-tests; however, it did suggest that length of T-Unit might not always be an accurate indication of fluency or clarity.
3. **Words Per Clause Preferable.** It was possible that the words per clause index might more closely measure the maturity of sentence structure at the grade ten level. Hunt (1970) had found that a student's mental ability and chronological age seemed to be closely related to his clause length. In his earlier study (1965), he had discovered many of the hallmarks of mature writing had correlated significantly with clause length. In the present study, there seemed to be a correlation between length of clause and writing performance. The superior writers mentioned above had mean clause lengths of 15.5, 14.2, and 13.2, in comparison to Hunt's score of 11.5 for superior adults. In these cases, clause length indicated their superiority where T-Unit length had not. The post-test score of the experimental group in clause length was 9.96 words, and although this did not represent as large a gain, it was fairly close to the control class's 10.56 words. If clause length were a better measure of "maturity" than T-Unit length, the relative closeness of these scores might help to explain why there was so little difference in the quality of writing of the two groups when the matched compositions were judged.

4. **Writing Workshops.** The investigator next explored the role of the writing program which stemmed from the "Writing Workshops" designed by O'Hare as part of his elective course in writing and included in the sentence-combining text. How much influence the small group programs had upon the quality of writing
in the matched pairs of compositions judged by the nine English teachers was almost impossible to determine, but it was at least possible that the intensive nature of the writing practice engaged in by the students was the common denominator that proved equally effective in polishing the "style" of both the control and experimental groups.

5. **Grade Level.** Sentence sense was undoubtedly an important aspect of style, and the student who could frame his thoughts in smooth, well-ordered sentences couched in standard English had a great advantage over the pupil whose prose was characterized by short, choppy sentences, long, stringy sentences, fragments, or frequent grammatical errors. However, such prose was surely more common among younger writers than it was at the grade ten level where most students could write well-formed sentences. The question then arose as to whether the syntactic gains resulting from the practice of sentence-combining might more effectively determine the "quality" of writing in grade seven, where all of the previous studies were conducted.

6. **Syntactic Maturity Only One Criterion Among Five.** In judging the "overall quality" of the writing sample from the control and experimental classes, the markers were not primarily concerned with sentence structure; as Mellon said, "... it was merely one factor among five which they were simultaneously attending." (p.69)
Certainly the raters were not told of any special significance being attached to the complexity or grammaticality of sentences. If sentences were well-constructed, and in correct English, the rater would go on to a consideration of the ideas they expressed. In doing so, he would take into account the organization of these ideas, the diction, and the style of the writer. "Style" was used to mean the way in which the writer, in adapting his language to his ideas, reflected his individuality, and the way in which his liveliness and immediacy held the interest of his reader. In deciding between a pair of compositions that appeared to be closely matched on all criteria, the marker's individual preference in styles might well be the deciding factor in his choice. If one student gave a terse, unemotional, but graphic account of a dramatic incident, while another wrote a more ornate and impassioned, but equally compelling version, then the rater chose between "styles" according to his own concept of "quality." When maturity of sentence structure was only one index in five, and no more important than the rest, then the gains of the control group might well have not been a determining factor in the judgment of "quality" by the markers.

6. **Rater Variable.** One final matter that must be included in this discussion of compositions concerns the rater variable. Potter (1967), in speaking of research designed to test various approaches to the improvement of writing, warned that care
should be taken to establish what was meant by "quality." It was possible that in certain instances the lack of agreement between markers could stem from individual interpretations of the criteria, for even highly qualified, thoroughly experienced English teachers might differ considerably in their conceptions of "quality" and the influence of "style" in determining it. It might be that prior to the commencement of marking, too little time was spent in an effort to secure some mutual agreement about what constituted "quality" in sentence structure, organization, diction, style, and ideas. Perhaps more compositions, carefully selected, should have been compared in the practice session.

Implications

In the foregoing discussion, a number of possibilities were explored in an effort to explain the apparent inconsistencies in the conclusions drawn from the results of this investigation. Specifically, the exploration sought to discover why (1) the experimental group did not achieve the syntactic growth hypothesized for it, and (2) the overall quality of the writing of this group was considered equal to that of the control group despite the latter's significantly greater gains in syntactic maturity. During this process of "belabouring the conclusions," as Mellon (p. 71) called it, a number of implications were made:
1. That certain problems arose when replicating at the grade ten level a study designed for the grade seven level, as growth in "syntactic maturity" did not seem to be as discriminating a criterion of quality in the writing of older students.

2. That clause length might be a better index of maturity than T-Unit length with grade ten classes, as the length of T-Units was not always indicative of good writing.

3. That syntactic complexity, measured by clause and T-Unit length, was more pronounced in descriptive writing than in the other modes.

4. That an intensive program of free writing might be more effective in influencing the "style" or "quality" of students' writing than either a grammatical or non-grammatical approach to the structuring of sentences.

5. That a larger, more heterogeneous subject population might ensure more conclusive results.

6. That the aspect of style which reflected the individuality of the writer in his approach to his subject, and the liveliness and immediacy of his discourse might be a more effective measure than the complexity or "maturity" of sentence structure in distinguishing "quality."
7. That a grammar-oriented approach to the acquisition of syntactic skills should limit the range of grammatical concepts studied in order than less time might be spent in learning terminology and more in the application of those terms to a variety of sentence-combining techniques.

8. That an effort be made to define more closely what is meant by "quality" in writing, and to ensure a common interpretation of the criterion of "style."

As one of the principal concerns of the present research had been to determine whether or not an increased skill in structuring sentences would be transferred to the writing process, it was unfortunate that no clear evidence of such a transfer was obtained. However, even though overall quality might not have been improved by the treatments, the treatments were of some benefit in themselves.

Benefits of Sentence Combining

An evaluation of the sentence-combining program carried on during the year in the control group, revealed that it had been beneficial in a number of ways:

1. In being exposed to a wide variety of sentence-combining techniques, including subordination, reduction, and cumulation, the student's "syntactic choices" were broadened, and his ability to structure language enhanced.
These skills might have contributed to "his ease of expression," particularly in descriptive writing, but whether or not they influenced "quality" depended upon a definition of the term.

2. The syntactic skill they acquired was employed in a constructive building process during which the student learned to hold longer and longer discourse in his head, an achievement which may have contributed something to his cognitive development. About this Mellon observed:

In rehearsing the full statement while forming it and appraising its grammaticality, the student experiences it repeatedly and thus in a particularly intensive manner. Lastly, he must retain the fully formed sentence in memory while he writes it, and practice in this mnemonic skill may indeed be crucial. (p. 36)

In commenting upon this observation, Stotsky (1975) compared it to Vygotsky's (1962) description of the act of writing:

Writing . . . requires deliberate analytical action on the part of the child. . . . The change . . . to maximally detailed written speech requires what might be called deliberate semantics—deliberate structuring of the web of meaning.

W. Strang, in an article in the English Journal (February 1976), reflected Vygotsky's view, as he said of sentence-combining:
it helps kids bridge a linguistic gap between the incredible transforming power in speech and the painful silence they often experience when they confront a blank piece of paper. (p.64)

3. The process of sentence-combining was based upon the student's inherent sense of grammaticality, which would usually enable him to tell whether a solution was acceptable. Oral work in particular helped him to judge whether a sentence "sounded right." As Strang commented in the above article, "all the kids we teach are sentence-generating geniuses--transformational wizards who have tremendous banks of linguistic data already programmed into their brain computers" and sentence-combining helped students to "tap their own linguistic resources." (p. 56)

4. Sentence-combining helped to increase the self-confidence of students because of the success they achieved in the process. All pupils, even the weaker ones, participated when solutions were tested orally in the easy give-and-take workshop atmosphere of the small group classes, which were not threatened by any form of examination.

Benefits of Grammar Study

In comparison to the advantage of the sentence-combining program, the benefits of the grammar study were more difficult to enumerate, as it was undoubtedly tedious for the students. However,
they recognized the usefulness of a guide to "what was to be pre-
ferred and what avoided in the inflection and syntax of their writing."
There was no certainty, of course, that the knowledge they acquired
would not also be halved after the summer holiday, or perhaps quartered.
One could only hope that the fraction remaining would be sufficient
to enable the students, after a thoughtful reappraisal of what they
had written, to recognize any inadequacies in the structure, to test
its grammaticality, and to determine whether there were any better,
more concise way of adapting their language to their ideas.

Students learned the importance of restructuring sentences
in order to improve their style when they were editing their work
for publishing. The relationship of style to syntax was an interest-
ing one that needed further research, as did the connection between
syntactic and cognitive growth. If the possibility that sentence-
combining promoted cognitive growth could be entertained, then
certainly the same could be said of grammar. In the article by
Stotsky (1975), a further quotation of Vygotsky's confirmed this:

... our analysis clearly showed the study of grammar
to be of paramount importance for the mental development
of the child. ... Grammar and writing help the child
to rise to a higher level of speech development. (pp.100-101)

Suggestions for Further Research

Throughout this chapter a number of suggestions were made
for further research in the study of syntactic maturity and its
relation to the writing process. A summary of these would include:
1. More conclusive results might be achieved if the scope of the study were widened to include a more heterogeneous group.

2. Valuable information could be gained by extending the experiment over a longer period in order that delayed post-tests could establish the relative permanence of the gains.

3. If funds were available to pay markers, more time could be spent on rater training, and on a more precise evaluation of the sample of post-test compositions compared for quality. In addition, the number of pre- and post-treatment compositions written by the students could be increased in order to get a more adequate sample of writing at each testing period. If this were done, the question of whether significant gains in syntactic maturity should be recognizable in improved style could be more adequately tested.

4. Important information could be provided by a study of the relationship between growth in syntactic skills and cognitive growth.

5. It would be of interest to determine whether the sentence-combining process improved reading skills. A reading comprehension test could be given at pre- and post-test periods to measure any change.

6. Research involving a sentence-combining experimental class and a control class doing free writing might give some
new insight into which process was more effective in improving
the quality of writing.

The present study has caused the researcher to conclude
that sentence-combining would be most appropriate as a skill-building
adjunct to the composition program. It would perhaps be more useful
without any signals, in the open format suggested by Strang. Although,
as Combs remarked, sentence-combining was "no panacea" for all the
ills of student writing, it was a most useful procedure for demon-
strating the great variety of options available to the student when
putting his thoughts on paper. As he learned to choose the most
effective methods of adapting his language to his ideas, he created
more pleasing patterns in his work, and enhanced his style. However,
the problem with this approach was not unlike that of a grammatical
approach, as both, taught in isolation, were of little lasting
benefit. Although the "a-rhetorical" practice of sentence-combining
did not lead to a "conscious" transfer to the writing process of
the skills acquired, some did "rub-off" and was manifested in a
greater complexity of sentence structure, but this carry-over might
be for only a limited time.

It would seem that a "conscious" transfer of this ability
to manipulate language was what was needed by students. In order
for a "grammatical" or "non-grammatical" study of sentence structure
to be of greater permanent value, it should be carried on in a
"rhetorical" setting, where students learned to manipulate their own sentences, reorganizing, combining, reducing, or clustering, in order to create more variety, conciseness, or clarity in their writing. This process would involve considerably more discipline and hard work, but once learned, should be of inestimable value to the maturing student who was beginning to view his efforts with a more critical eye, and to seek a more effective way of expressing his ideas. This sort of self-evaluation and revision would not be evident in compositions written in class under the pressure of time, but would result in a higher "quality" of composition when the writer was not rushed in his editing.

The goal of improving "syntactic maturity" in student writing might be reached most effectively by an approach reflecting the ideas of both the psycholinguists and the rhetoricians. Piaget, Moffett, Britton, and Holbrook stressed the importance of a student-centered writing curriculum in which process was more important than product, for clear writing could only be derived from clear thinking. To reach this end, teachers worked with the students' own composition and evinced a sympathetic understanding of student problems. Rhetoricians, on the other hand, emphasized the need for maintaining higher standards in "a society which reared its children on sentimental and shoddy reading matter, which bathed them in the linguistic sludge of television, and which debased the English language in the place where it all began: at home."
A. Giamette, in writing thus in the January, 1976 issue of Yale Alumni Magazine, decried the sentimentality of modern trends toward freeing language from "the shackles of syntax, the racism of grammar, the elitism of style." Therefore, an ideal approach to the study of sentence structuring would be one that was integrated with the composing process in order that the product might conform to higher standards of excellence.
BIBLIOGRAPHY


Perron, J.D. "An Exploratory Approach to Extending the Syntactic Development of Fourth-Grade Students Through the Use of Sentence-Combining Methods." Dissertation Abstracts International, 35 (1975), 4316A.


Seegers, J.C. "Form of Discourse and Sentence Structure," Elementary English Review, 10 (1933), 51-54.

Stalnaker, J.M. "The Construction and Results of a Twelve-hour Test in English Composition," School and Society, 39 (1934), 218-224.


APPENDIX A

ANALYSIS OF COVARIANCE FOR T-UNIT LENGTH SCORES OF 26 EXPERIMENTAL AND 25 CONTROL SUBJECTS* FREE WRITING PASSAGES

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Pooled Regression Coefficients

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*4 control and 1 experimental subjects not included in analysis because of missing data.
APPENDIX B

ANALYSIS OF COVARIANCE FOR CLAUSE LENGTH SCORES OF 26 EXPERIMENTAL AND 25 CONTROL SUBJECTS' FREE WRITING PASSAGES

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Pooled Regression Coefficients

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* 4 control and 1 experimental subject not included in analysis because of missing data
APPENDIX C

ANALYSIS OF COVARIANCE FOR T-UNIT LENGTH SCORES OF 26 EXPERIMENTAL AND 25 CONTROL SUBJECTS' ALUMINUM PASSAGE

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Pooled Regression Coefficients

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APPENDIX D

ANALYSIS OF COVARIANCE FOR CLAUSE LENGTH SCORES OF 26 EXPERIMENTAL AND 25 CONTROL SUBJECTS' ALUMINUM PASSAGE

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Pooled Regression Coefficients

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2-nd Covariate  0.01678

* 4 control and 1 experimental subjects not included in analysis because of missing data
APPENDIX E

GRAMMAR EXAM – EXPERIMENTAL GROUP

MARKS OF EXAM
APPENDIX

GRAMMAR EXAM - EXPERIMENTAL GROUP

GRADE TEN GRAMMAR EXAM

INSTRUCTIONS: Rewrite the following sentences on foolscap, correcting each in the way specified in each set.

SET I - Faulty Coordination - occurs when two unequal ideas are placed in coordinate clauses as though they were of equal importance.

A. Correct by the use of a subordinate clause:
   1. Peter is going to college in the West, and he came in to say goodbye.
   2. I didn't understand how to do the assignment, and I didn't have my homework done.
   3. Franklin was a scientist as well as a statesman, and he invented a new kind of stove.

B. Correct by a modifying phrase:
   1. We were delighted to receive a bushel of oranges, and they came from Florida.
   2. He told me to look in the unabridged dictionary, and it was on his desk.

C. Correct by an appositive:
   1. Mr. Carter is a very fine man, and he is pastor of a very active church.
   2. The violin was an old instrument with a beautiful tone, and it belonged to my father.
   3. The plane is the fastest passenger plane in the world, and it will take you to Europe in record time.

D. The relationship between ideas in the following sentences is not clear, either because the conjunctions used are not exact, or because the sentences contain faulty coordination. Improve the sentences by rewriting them.
   1. You want me to help you with your homework, and you must help me with the dishes.
2. Stewart Harrison was a famous detective, and he could not solve the arsenic murder case.

3. Uncle Bill is my favourite uncle, and he has invited me to spend the summer with him.

SET II - REFERENCE OF PRONOUNS - rewrite the following sentences and correct any general reference (The boys wore ski boots to class which the teacher did not like), or weak reference (We fished all day, but didn't catch one), or the indefinite use of pronouns such as it, they, and you, or any unclear reference of pronouns.

1. A number of people gathered around the speaker and his microphone, which was due to curiosity.

2. On planes that are in flight at mealtime, they serve meals without charge.

3. He overcame his hip injury which doctors had said was impossible.

4. Father Meyer came to the house daily, from which a sturdy friendship grew.

5. The witness testified that he had seen the accused when he was eating dinner in the dining car, which convinced the jury of his presence on the train.

SET III - Misplaced or Dangling Modifiers - improve the sentences by putting the misplaced phrases or clauses closer to the word they modify. Sometimes adverbial modifiers can be moved to the beginning of the sentence.

A. 1. If what the directions say is true on the package, this is a powerful drug.

2. Mr. Simmons met a friend he hadn't seen for ten years in Grand Central Station.

3. While lighting a cigar, the car swerved dangerously toward a telephone pole.

4. Ever changing colour, ever forming new shapes, her eyes followed the clouds.

5. The next casualty treated by the corpsmen was lying on a stretcher suffering with a broken leg.

6. While watching the ball game, Sid's horse ran away.

B. Write two sentences of your own, using introductory participial phrases correctly.
SET IV - Parallelism - correct the lack of parallelism in the following sentences by: (a) seeing that the correlative conjunctions are properly placed, (b) by making sure that only equal terms are joined with a coordinate conjunction, and (c) including in the second part of a parallel construction all words necessary to make it complete.

A. 1. Tell me where you have been and an account of your activities there.
   2. He regarded all natives as sly, ignorant, and not to be depended upon.
   3. Pioneers came with hopes of being happy and free and to make their fortunes in the new land.
   4. He neither told me that I should attend the meeting nor make a report.
   5. His friends not only were shocked by his failure but also they felt a great disappointment.
   6. To the inexperienced soldier, war may be a romantic adventure, but a dull and dirty business is the way the combat veteran regards it.

B. 1. Write a sentence illustrating parallel structure with the use of correlative conjunctions.
   2. Write a sentence illustrating parallel structure with infinitive phrases, or with gerunds.

SET V - Shifts in Verb Forms (active to passive within the sentence, or in tense) - shifts from one subject to another. Rewrite the following sentences to avoid unnecessary shifts.

1. Once a customer bites into one of our steaks, you will never complain about our bill.
2. Properly equipped men can survive for months in the Arctic and no ill effects will be suffered.
3. Although we could not see the planes, their motors could be clearly heard.
4. If a person wished to succeed, you have to work hard.

SET VI - Sentence Conciseness - Rewrite the following passages, leaving out all unnecessary words.

1. As you continue on in the book a little further, you will be surprised and amazed by the clever skill of the writer of the book in weaving in together the many previously unrelated threads of the story.
2. His mental thought processes puzzled his school teachers and made them despair of his future success in the years after his graduation from school.

B. Avoid wordiness by reducing the following subordinate clauses according to directions.

1. When he was running for the bus, George fell and twisted his ankle. (Replace sub. cl. with a participial phrase).
2. If you leave at noon, you can get to Chicago by three. (Replace clause with a gerund phrase).
3. We decided that we would get an early start. (Replace clause with an infinitive phrase).
4. The teams which had come from the far West were not playing today. (Replace clause with a prepositional phrase).
5. After you have graduated, you will be looking for a job. (Replace clause with prepositional phrase).
6. My mother, who is the kindest woman in the world, will help you with your problem. (Replace clause with an appositive).
7. Since she is an automobile dealer, Mrs. Holmes has promised her children a car as a gift when they reach twenty-one. (Change the first clause to an appositive, and the second to a prepositional phrase).
8. Her two specialities, one of which is cooking and the other sewing, helped her to get the job. (Change clause to two single word appositives).
9. We decided to wait for the bus in order that we might save money. (Change clause to infinitive phrase).
10. Our days that we spent in the north woods would have been perfect if it had not been for the mosquitoes that troubled us. (Reduce first clause to a prepositional phrase, and the second clause to a single word).

SET VII - Combine the following sentences into one smooth sentence, avoiding any unnecessary words, but leaving out no information.

1. Galen was a famous physician of the second century. He added greatly to our knowledge of the body. He discovered important facts about the arteries, the brain, and the nervous system.

2. Serious wildlife protection began in the United States in the 1880's. It was headed by conservation groups. Among these groups were the National Audubon Society and the Crockett Club.
3. He stood at the top of the stairs. He watched me. I was waiting for him to call me up. He was hesitating to come down. His lips were nervous. They had the suggestion of a smile. My eyes were asking whether the smile meant come, or go away.

SET VIII - Subject-Verb Agreement - Correct any errors in subject-verb agreement, or pronoun-antecedent agreement in the following sentences.

1. Everyone in the class were instructed to fill out copies of their schedule.
2. Neither Smith nor Ford have remembered to have their uniform cleaned.
3. Everyone of us is glad that we brought a coat.
4. Emily, as well as her cousin, walk to their school every day.
5. Neither Captain Travis nor the other officers talk about their experience.
6. The team of basketball players travel to their game in Seattle.

SET IX - Write a sentence in each of the following patterns; underline and name the parts of each pattern:

E.g., S + V + O. The new player hit the ball into left field.

A. 1. S + V (Use a gerund or infinitive as subject).
2. S + V + IO + O (Use a noun clause as object).
3. S + "be" + C (Adj.) (Use an adjective clause to describe the subject).
4. S + "be" + C (N) (Use a noun clause as subject).
5. S + link v. + C (Use a verb in the past perfect tense).
6. S + V + O + OC (N) (Use a verb in the present progressive tense).

B. Write a sentence in the passive voice, giving a politician's answer to a question about why his government hasn't built new roads.

SET X - Make any necessary corrections in the following sentences.

1. The cannery manager was having trouble getting workers and advertisements promising high wages were used.
2. On the canoe trip we carried a first aid kit because one never knows when you will need one of them.

3. The honest cowboys caught up with the gang at the bend of the road, and then a fierce battle ensues.

4. Since the children enjoy picnicking, we go on several every summer.

5. Yielding to the temptation to look at a classmate's paper, the teacher caught her cheating.

6. He thought it easier to listen to news on the radio than reading the newspaper.
## APPENDIX E

Experimental Group's Marks

Grammar Examination, June, 1977

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<th>Letter Grade</th>
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APPENDIX F

1. COMPOSITIONS TOPICS - IN PARALLEL FORMS

DESCRIPTIVE

NARRATIVE

EXPOSITORY

2. ALUMINUM PASSAGE
COMPOSITION TOPICS
(Form A, Fall)

DESCRIPTIVE

Good writers can use words to paint pictures. Not only that, but they can use words to convey sounds, smells, tastes, and things that you feel. When you describe a scene, you try to make words tell what the things you see are doing and what they look like. You also try to say what they sound like, and how they smell or taste, and how they feel. Select one of the following scenes, and imagine that you can see it in your mind's eye, they describe it with vivid, lifelike word pictures. Don't tell a story, just describe the scene. Write two to three paragraphs, or approximately a page.

1. The Dinner Table at Thanksgiving
2. Hallowe'en Night
3. An Afternoon in Midsummer at the Beach
4. The Auditorium During A School Dance
5. A Frightening Storm
6. A Birthday Party
7. A Busy Airport or Bus Depot.
COMPOSITION TOPICS
(Form B, Spring)

Good writers can use words to paint pictures. Not only that, but they can use words to convey sounds, smells, tastes, or feelings. When you describe a scene, you try to make words tell what the things you see are doing and what they look like. You also try to say what they sound like, and how they smell or taste, as well as how they feel. Choose one of the following scenes, and try to describe it as vividly as you can. Make your description approximately one page long.

1. Our Recreation Room After A Party
2. A Horrible Accident That I Saw
3. A Terrible Fire That I Saw
4. A Meal I Greatly Enjoyed
5. The Beach in the Early Morning
6. A Spring Scene in Stanley Park (or other region).
NARRATIVE

Biographies tell where a person was born, where he grew up, what he did in life, and when he died. But the little things that happen to you sometimes make more interesting stories. Choose one of the following and write a TRUE story about it. When you write about something that really happened, you write with more feeling and intensity. Be sure to say when and where it happened, what you were doing at the time, what actually took place, and how you felt about it then or later. Write about three paragraphs, or about one page.

1. The Worst Weekend I Ever Had
2. The Unhappiest Day of My Life
3. The First Time I Felt Real Fear
4. My Most Embarrassing Experience
5. My First Time in the Principal's Office
6. My First Day on a New Job
7. My First Fight With a Friend
8. The First Time I Felt Real Sadness
NARRATIVE

Biographies tell where a person was born, where he grew up, what he did in life, and when he died. However, the little things that happen to you sometimes make more interesting stories. Choose one of the following and write a TRUE story about it. Be sure to say when and where it happened, what you were doing at the time, what actually took place, and how you felt about it then or later. Write about three paragraphs, or approximately one page.

1. My Luckiest Day
2. My First Encounter With the Police
3. My First Day at a New School
4. A Terrible Quarrel that Really Frightened Me
5. The First Time I Felt Fear at a Party
6. My Greatest Disappointment
7. My First Experience With Drinking
8. The Problems of Being in too Many Activities at School
COMPOSITION TOPICS
(Form A, Fall)

EXPOSITORY

It is very important to be able to tell someone else how to do something, or how something operates. Choose one of Topics A or B, which ask you to explain how a system works: (Write two or three paragraphs—about a page).

A. Imagine you have been appointed as administrator of a large new school. You were selected because of the statement you submitted, which told how you would run an ideal school. Your ideas on grade ten were of particular interest, as you stated what number of subjects students should have, which should be compulsory, what electives would be possible, how teachers would be selected, what forms of discipline would be used, how long the school day and what amounts of free time there would be, as well as your views on holidays, homework, and extracurricular activities. Make your school as innovative as you like, as long as you can persuade your audience it is ideal (at least for students) as well as reasonable.

B. A man like Benjamin Franklin was an expert on gadgets and appliances for the home in his day. He even invented a few
new appliances himself, such as the famous Franklin stove. Pretend that a time machine is bringing Franklin to visit the modern age. Your task is to bring him up to date on developments in the home since his time. Write a report that you could give him, telling about several home appliances and gadgets that have been invented between his day and our own. Tell him how they work and what they can do, and anything else you think he might like to know.

OR

Do One of the following:

Whenever we feel strongly about something, we often try to persuade others to think as we do, or to do what we want them to do. We usually try to think of as many good reasons as possible to persuade them to believe as we do, or to act as we want them to act. Choose one of the situations listed below, and write a composition of two to three paragraphs. You should have approximately a page of writing. If you wish, you could express your views in a letter to a newspaper editor, a school principal, a counsellor, or a parent.

1. Imagine you have won a two-week holiday to Hawaii, and you are trying to persuade your parents that you should be able to take a friend and go on your own (marshal as many arguments as you can). Write them a letter as they are away when you get the news.
2. Imagine you are being interviewed by the personnel manager of Safeway's, who has a job opening at $8.00 an hour, for work on Thursday and Friday evenings, and all day Saturday.

(a) Persuade the manager to hire you   OR
(b) Imagine you have been offered the joy—persuade your parents to allow you to accept it!

3. Persuade an English teacher to limit homework to once a week, and tests to once a month.

4. Persuade your fellow students that racial and other forms of prejudice do exist in your school, give specific instances, and show how this prejudice can be eliminated.

5. Persuade your parents that their ideas on discipline are outdated, and that a more liberal attitude should be much more effective.

6. Persuade your parents that you are now too old to go on holidays with them. Explain why you no longer enjoy accompanying them, and suggest ways of dealing with the situation.
EXPOSITORY

It is very important to be able to tell someone else how to do something, or how something operates. Choose one of Topics A or B, which ask you to explain how a system works:

(Write 2 or 3 paragraphs—about a page)

A. Perhaps you know someone your own age who lives in a foreign country, who has never visited Canada, and is extremely interested in our way of life. Write your friend a letter in which you tell him everything that happens to you during a normal day in your school—what classes you attend, how they are taught, what the other activities are, what the rules and privileges are, and any of the things that you think are "special" about Canadian schools that might interest him. Remember that you are informing him, but also persuading him how great the Canadian education system is.

B. A Man like Daniel Boone was an expert on transportation in his day. He knew all about horses, coaches, canal boats, and ships, as well as walking! Pretend that a time machine is bringing Daniel Boone back to visit the modern age. Your task is to
bring him up to date on developments in transportation since his time. Write a report that you could give to him, telling him about several modern means of transportation, how they work, what they can do, or anything you think he would want to know. Inform him, but also persuade him how great the improvements are!

OR

Do ONE of the following

Whenever we feel strongly about something, we often try to persuade others to think as we do, or to do what we want them to do. We usually try to think of as many good reasons as possible to persuade them to believe as we do, or to act as we want them to act. Choose one of the situations listed below, and write a composition of two to three paragraphs. You should have approximately a page of writing, unless your writing is very large, in which case you will need more space. If you wish, you could express your views in a letter to: a newspaper editor, a school principal, a counsellor, or a parent.

1. The High Cost of Driver Training and Licenses for Young Drivers
2. The Advantages (or Disadvantages, or both) of Television for Me
3. My Attitude Toward Teenage Drinking
4. What Divorce Does to a Family
5. The Many Forms of Cheating That Go on in School
6. The Advantages (or Disadvantages, or Both) of an After School Job
7. How I Feel About the Police.
Aluminum is a metal. It is abundant. It has many uses. It comes from bauxite. Bauxite is an ore. Bauxite looks like clay. Bauxite contains aluminum. It contains several other substances. Workmen extract these other substances from the bauxite. They grind the bauxite. They put it in tanks. Pressure is in the tanks. The other substances form a mass. They remove the mass. They use filters. A liquid remains. They put it through several other processes. It finally yields a chemical. The chemical is powdery. It is white. The chemical is alumina. It is a mixture. It contains aluminum. It contains oxygen. Workmen separate the aluminum from the oxygen. They use electricity. They finally produce a metal. The metal is light. It has a luster. The luster is bright. The luster is silvery. This metal comes in many forms.
APPENDIX G
APPENDIX G

Academic Degrees Held and Prior Experience
of Teacher Evaluators

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APPENDIX H

RAW SCORES
Pre- and Post-Test Scores on Two Indices of Syntactic Maturity I.Q., and Letter Grade of the Experimental Group

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Mean Change—T-Unit Length—1.65 Clause Length—.50
Pre- and Post-Test Scores on Two
Indices of Syntactic Maturity,
I.Q., and Letter Grade of the
Control Group

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Mean Change--T-Unit Length--4.48 Clause Length--1.57
Pre- and Post-test Scores on Two Indices of Syntactic Maturity

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Mean Change--T-Unit Length--6.10 Clause Length--1.29
APPENDIX I

POTTER'S DATA
### Potter's Quantitative Data

on "Good" and "Poor" Writing Examined

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For values of $N$ larger than 100, approximate values of $r$ may be found by taking the nearest integer less than $(N - 1)/2 - k \sqrt{N + 1}$, where $k$ is 1.2870, 0.9800, 0.8224, 0.5752 for the 1, 5, 10, 25% values, respectively.
APPENDIX K

WRITING WORKSHOP SAMPLE
Obituary Column: write a mock obituary mourning the death of selflessness, 5¢ candy bars, the internal combustion engine, morality, or something else that you feel has passed away.

Sample Responses

NATURE, MOTHER: The passing today was announced of Mother Nature. She passed away last night at 6:30 p.m., of severe pollution. Hope was found earlier in the day with the discovery of a small patch of clean air over the central Alps. However, it dissipated later in the day. She had been recently saddened by the loss of her children, known to friends as Trees and Animals.

Mother Nature's severe illness began in the early Industrial Revolution, although her ailments were not noticed until the mid-twentieth century. Unfortunately, her tenants, Men, were unconcerned by her illness until they were affected, by which time it was too late. At the time of her passing she was alone, for by the time she had received proper care, she had lost her beloved Resources and Ozone Layer. Truly, all were saddened by her passing.

She was survived by no one.

RESPECT, F. P.: Funeral services were held yesterday to mourn the death of something treasured—respect for parents. Although expected, the death of respect was a lingering one, and the end came as a shock to many, especially those over forty years of age.

The slow demise of parental respect began in the mid-sixties when young people began to riot and turn against the crass materialism of their parents (although at the time they were revolting they were attending university at the expense of their aforementioned parents). The death mystified most doctors, who did everything possible for the victim. Massive doses of discipline, lectures, and even, in rare emergencies, the application of severe pressure to the anatomy, were administered, but all to no avail.

Respect for parents, being born in the year one, was comatose for the past few years, but finally and mercifully was left to die. Such prominent political figures as Dave Barrett, and British Columbia's Human Resources Minister Bill Vander Zalm expressed their sincerest heartfelt sympathy for several hours.

The eulogy was delivered by a parent affected by the death, to a large group of mourners who later stood in line for hours to view the remains lying in state. The pallbearers included Love-for-Parents, the Family-Unit, and Obedience. Respect for Parents is survived by Rudeness, Bad Behaviour, and General Contempt for the Older Generation.