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Comparative study of the relationship between academic aptitude and achievement in English for one hundred eighty-eight Butte high school graduates

Nellie Mary Crowley

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A COMPARATIVE STUDY OF THE RELATIONSHIP BETWEEN ACADEMIC
APTITUDE AND ACHIEVEMENT IN ENGLISH FOR
ONE HUNDRED EIGHTY-EIGHT BUTTE
HIGH SCHOOL GRADUATES

BY

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B. A. UNIVERSITY OF MONTANA, 1954

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degree of
Master of Arts

MONTANA STATE UNIVERSITY
1958

Approved by:

Chairman, Board of Examiners

Dean, Graduate School

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CHAPTER I

THE PROBLEM

The primary purpose of this study was an attempt to determine whether certain graduates of Butte Public High School exhibited a statistically significant difference in performance on tests of effectiveness of expression and mechanics of expression at the college level. A secondary purpose of the study was an attempt to determine the degree of relationship between measured general academic ability and performance in the areas of mechanics and effectiveness of expression in English.

IMPORTANCE OF THE PROBLEM

The writer was a member of a group appointed to examine the possible revisions in the English curriculum at the junior high school level of the Butte Public School system.

There was agreement within the group that traditionally there may have been more emphasis placed upon instruction in mechanics of expression than upon the effectiveness of expression. The thought also existed that for students preparing for college such emphasis may have eventually resulted in performance of expression below the desired standard.

Since little or no objective evidence existed as to the reality of this condition, this study was undertaken. A knowledge of whether the curriculum as it now exists makes adequate provision for instruction
in the effective use of the English language will be necessary before the actual revision begins.

DELIMITATION OF THE PROBLEM

This study was restricted to an investigation of the results obtained from the scores made by Butte High School students entering the Montana State University in the fall of each year from 1948 through 1956.

This study was of necessity limited to those students who entered Montana State University and had taken two tests — namely, The American Council on Education Psychological Examination, hereafter referred to as the ACE, and the English Cooperative Test.

A possibility exists that if all Butte High School graduates were compared to a population of high school graduates, whether college preparatory or not, the results would have been the same. Again, if all high school graduates who enter college could be tested, the results might be different from those obtained from Montana State University entries.

DEFINITION OF TERMS

Mechanics of Expression in this study is defined as grammatical usage, punctuation, capitalization, and spelling as used in English composition.

Effectiveness of Expression will be considered as sentence structure and style of prose, the ability to rearrange disorganized items in a composition, and to complete a partial outline.
CHAPTER II

REVIEW OF RELATED LITERATURE

Much has been written about English as the term applies to literature, composition, grammar, mechanics, and effectiveness of expression. However, a limited amount of research seems to have been done in determining the degree of relationship between measured general academic ability and performance in the areas of mechanics of expression and effectiveness of expression at the college level.

Monroe notes that the results of research in English have not been as far reaching as might be expected. The condition may be due to the quality of the research which has been done. Again, the condition may be due to the failure to make use of the available results.¹

Despite the fact that studies pertaining to the exact nature of this problem were not available, it was deemed feasible to examine the literature for the research which had been done in this field.

Fletcher and Hildreth in interpreting the results of the Ohio State University English Placement Test and the Ohio State Psychological Examination noted that the most effective teaching of freshman English composition is best accomplished when students are assigned to the course on the basis of ability and achievement.²


Therefore, The Ohio State University English Placement Test is divided into six parts—namely, spelling, punctuation, usage, vocabulary, grammar, and sentence revision.

The high degree of relationship between the scores on the English Placement Test and the Ohio State Psychological Examination, hereafter known as the O.S.P.E., (.75 with the total group) raised an issue as to whether the administration of both tests was essential. The authors concluded that,

Although the English Placement Test and the O.S.P.E. do intercorrelate highly, they do not measure exactly the same things. Approximately 20 per cent of the students with scores below the 15th percentile on the English Placement Test had O.S.P.E. scores above the 30th percentile. Presumably, most of the students had ability to master English composition, but their achievement had been retarded for one reason or another. Hence, this group should profit by English 400 course. It is possible that students with superior ability as indicated by the O.S.P.E. might well be able to do adequate work in English 401 and O.S.P.E. scores should be taken into account in placing students in courses.

Commenting on the need for remedial work in English, Giles M. Sinclair states,

At one Midwest institution of which I have personal knowledge, 65% of the total English faculty load is devoted to remedial sections. At a highly respected university in California 20% of the entering freshmen go into remedial English. In a hundred college catalogs chosen at random I found none which did not offer a remedial course. .... It seems likely that 20 to 30 per cent of college composition is being taught at high school level.

3Ibid., pp. 7-17.

Sinclair asserts that the inclusion of a high school English course in the college curriculum is one means of articulating the programs, but it apparently is not a satisfactory one from the standpoint of student, college, or high school. The University of California, the University of Illinois, and the University of Washington are preparing to take steps to eliminate remedial classes from the regular schedules.\textsuperscript{5}

"The high schools and the colleges," Sinclair maintains, "can to a large extent solve the problem if they see it as a common one." They can attempt to make a wise division of responsibility (not blame) and concentrate on those aspects of a solution which can be solved directly.\textsuperscript{6}

Administrators, advisers, and counselors, as well as high school students must be convinced of the need for every high school student, who receives a diploma to have had a well-directed experience in reading adult material. He must also have developed sufficient skill in writing, so that he is not handicapped when he enters college.\textsuperscript{7}

A manner of solving the problem is suggested in the Minnesota Communications Program. In December the high school students in the area were invited to the college to take the English Cooperative Test plus a four hundred word theme. The high schools then offered remedial classes to those students having weaknesses.\textsuperscript{8}

\textsuperscript{5}\textit{Ibid.}, pp. 291-293.
\textsuperscript{6}\textit{Ibid.}, pp. 291-293.
\textsuperscript{7}\textit{Ibid.}, pp. 291-293.
\textsuperscript{8}\textit{Ibid.}, pp. 291-293.
That there is a direct relationship between scholastic aptitude or general intelligence with reference to the requirements of most college curricula has been noted by people in the field of research.

Lorge and Kruglov were primarily concerned with the relation between intelligence and written composition. They maintain that, "In practice it has been assumed that the quality of a person's written expression is a reflection of his intellectual ability. Educators have long assumed that the relationship between intelligence and the general merit of composition is high."9

Reed said, "We should judge intelligence to be the most important single factor of ability in English composition."10

The study by Lorge and Kruglov was designed "to test the hypothesis that both the structural and conceptual aspects of written composition are indicative of the general intellectual level."11

The study was limited to eighty-two students, all about the same age, who were members of the eighth and ninth grades of the New York City public schools. Since more than half the students in the study were applicants of highly selective schools in New York, and since the remainder came from so-called average classes, the sample may still exclude the very low end of the intelligence range for twelve to fourteen year olds.

10Ibid., p. 507.
11Ibid., p. 510.
Each student was given a vocabulary test and asked to write a composition of about one hundred words. The eighty-two compositions were evaluated in two ways. One measure was obtained from the Loge Readability Formula (a weighted composite of the relative number of hard words, i.e., words not on the Dale List of 769 Easy Words; of the relative number of prepositional phrases; and average sentence length).

Six doctoral candidates in the field of educational psychology were then asked to rank those compositions from poorest to best. No two compositions were to be given the same rank.

The eighty-two compositions ranged from a low of .39 to a high of .76 with the average intercorrelation at .67.

The authors concluded as a result of this study,

First, that even at a specified age, there is a significant relationship between the structural elements of composition (average sentence length, relative number of hard words, and relative number of prepositional phrases) and intellectual ability.

Secondly, there is a significant relationship between concept or "merit" aspects of written expression and intellectual ability. Thirdly, structural and conceptual aspects of written expression are significantly related to one another.

And finally, the relationship between conceptual or "merit" difficulty and intelligence is significantly higher than the relationship between structural or readability difficulty and intelligence. The data suggests that although "general goodness" of written expression involves structural elements, it includes much more. The more involves the communication of experience with significant effect.

D. B. Elswoth said in his study Decline of Verbal Standards in Universities, "People are endowed with varying degrees of verbal ability. Some are almost destitute of ability; some are remarkably facile; the

12 Ibid., p. 510.
talents of the vast majority fall at some point in between.\textsuperscript{13}

It is interesting to note the following observations by Blewett,

While in all the facets of the curriculum we must seek to maintain the highest possible standards compatible with the needs and welfare of our society, it must be realized that a quest for a gross fault in the mechanics of the educational system is a waste of time. In so far as this quest implies incapacity or apathy on the part of teachers, it is most unfair and can have only a malignant effect on school morale.\textsuperscript{14}

He concludes his observations by noting that two factors must be considered in examining the relationship between intelligence and verbal ability—namely, increased university enrollment and changes in high school curriculum.

While an increase in enrollment tends to lower the average intellectual level of university students, the change takes place at a relatively high level. In fact, universities could maintain high academic standards even if a still larger per cent of the population were to attend.

One fact worthy of our attention and consideration was presented in Blewett's study—namely, "The apparent decline in verbal ability in university students is less likely to indicate failure of instruction than to reflect the impact of cultural trends upon the educational system."\textsuperscript{15}


\textsuperscript{14}Ibid., pp. 93-100.

\textsuperscript{15}Ibid., pp. 93-100.
Several studies worthy of note have been made of testing programs and the results in the various fields where the testing programs were carried on. In some cases the results were used for placement purposes, in others for determining the reliability and validity of objective tests in the field of grammar, usage, and composition. Other programs were carried on for the purpose of noting improvement in the various phases of the English curriculum. While these studies were not similar to the one investigated by the author, they were relevant to the subject.

Averill reported that the freshmen entering Worcester State Teachers College are tested in September of their first year, and the sophomores in May of the second year, so that approximately two full years of college exposure has been sustained by students taking the ACE English Test. The results show that the students made considerable progress on the mechanical side of language expression (i.e., in grammar, punctuation, capitalization, spelling, etc.). Good improvement was also made in their ability to express meaning through proper sentence structure, facility in the use of words, and organisation of ideas.16

Vordenberg made a study at Indiana University to attempt to find an answer to the problem, "What does test taking have in common with theme writing?" and, "To test and themes measure the same ability, and if so which abilities?" 17


The errors made on the themes were compared with the errors the freshmen made on the Cooperative English Test, Form MA. The errors were grouped under five classifications: Grammar and diction, capitalization, punctuation, sentence structure, and spelling.

We found that when errors were combined (from both test and themes), most errors were made in spelling. Following spelling in descending order of frequency were grammar and diction, punctuation, sentence structure, and capitalization.

When the errors on the test and in the themes were ranked separately, the results appeared as follows:

**TEST**

1. Spelling
2. Grammar and diction
3. Punctuation
4. Capitalization
5. Sentence structure

**THEMES**

1. Grammar and diction
2. Sentence structure
3. Spelling
4. Punctuation
5. Capitalization 18

Vordenberg found that approximately 25 per cent of the errors in the themes were made in sentence structure contrasted to the finding that about 11 per cent of the errors on the test were made in sentence structure. Evidently the students were more skillful in selecting the "best" sentences written by others than in constructing effective sentences in their own themes.

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In the themes, 38 per cent of the errors were made in grammar and diction, whereas on the test, only 24 per cent of the errors were made in grammar and diction.

In all other groups (spelling, punctuation, and capitalization) the percentage of errors made on the test exceeded the percentage of errors made in themes.\(^9\)

Vordenberg concluded by noting that, "In general it may be said that this objective test offers some practice in areas of English usage which the student employs in his themes; however, the test also offers practice in areas which the student either avoids or simply does not use in his written work. On the other hand, the test neglects some areas in which the student obviously needs practice and measurement.\(^20\)

Of particular interest to the author of this paper was the study made at the University of Tennessee by K. L. Knickerbocker, entitled *Placement of Freshmen in First Quarter English*.\(^21\)

Two instruments were used in the investigation: two forms of the Cooperative English Placement Tests — CH and HI, and the themes which were used as a part of the English Placement Examination.

Knickerbocker as a result of the investigation concluded:

> There can be little question that the objective test was more efficient in revealing superior students and in rejecting mediocre ones than was the theme." ........ A more telling point

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\(^9\)Ibid., pp. 428-429.

\(^20\)Ibid., pp. 428-429.

against the theme is its exclusiveness. It succeeds in ferreting out only about half of the truly superior students.22

Data from 538 University of Illinois Liberal Arts College freshmen in Rhetoric I were analyzed by Berg, Johnson, and Larsen. They found that the scores of an objective test in the mechanics of expression correlated as high as .69 with final grades in rhetoric. They explained the high correlation by the fact that the preparation of many students was such that instructors "probably view more sternly objectively ascertained errors such as "he don't" and alright" than the more subjectively determined errors as triteness and freshness of treatment."23

Kelly and Roberts commenting on the use of objective tests said, "We have found that ability to detect and correct errors in exercises is not always accompanied by the ability to avoid similar or worse errors in original composition and that conversely students really proficient in composition may have indifferent success on a problem solving type of test. We hold firmly the conviction that a student's degree of proficiency in writing can be determined only by a demonstration of that proficiency in writing.24

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22 Ibid., pp. 228.


24 Ibid., pp. 429-435.

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During the fall quarter of the academic year 1936-1937, the General Testing Bureau and the University of Minnesota Testing Bureau collaborated to determine the efficacy of sub-freshman course in English. The investigators, Avery and Williamson, observed that the course in sub-freshman English, to which were assigned students with low verbal ability as well as specific deficiencies in usage and spelling, were not able to overcome these handicaps in three months time. 25

However, the evidence did show that a significant number of students who passed the sub-freshman course were able to do satisfactory work in Composition 4 (course for College freshmen), despite the fact that they had not met the requirement of the placement system. These students made significant gains in a standard test usage, even though as a group they did not reach the standard required of freshmen who were assigned to Composition 4. 26

The author concludes,

There is no escaping the fact that Sub-freshman Composition deals with definitely inferior students. There are, of course, exceptions to the rule. Many sub-freshmen have actually distinguished themselves in advanced English courses as well.

As was noted earlier in this review, aptitude and placement tests have been used for purposes of prediction. It was not the purpose of this study to predict, but the following excerpts from Glatfelter's study were noted because of the information pertaining to the Cooperative English Test in its relation to the ACE and the high school record.


26Ibid., 257-266.
One hundred and twenty students who entered Temple University in February, 1955, were used as subjects of Glatfelter's study which was done with the hope that, "The score given on the three parts of the test might give information to substantiate that presented by the high school record and aptitude test."27

As a result of this investigation Glatfelter concluded that "an admissions officer is able to render a more intelligent decision in the admission of students whose performance in high school is not consistent with the scores made on an aptitude test if a rating on an additional test such as the Cooperative English test is available."28

He continues,

It might also be said that it would be safe to admit students on the basis of their scores on the American Council Psychological Test and the Cooperative English test, regardless of the courses or grades which appear on the high school record, provided that they had the proper prerequisites for advanced courses in college."29

In 1936, Dora V. Smith and Constance McCullough published an analysis of the content of placement tests in freshman English. Their major conclusion was, "That colleges were concerned with a student's ability to use language correctly and effectively not to classify forms or to talk about them in technical grammatical terms."30

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28Ibid., pp. 383-384

29Ibid., pp. 383-384

30Dora V. Smith and Constance McCullough, "An Analysis of the Content of Placement Tests in Freshman English Used by One Hundred and Thirty Colleges and Universities", English Journal, 25:17-25,
The Study also pointed out that the percentage of schools including technical grammar in their tests ranges from 31 per cent in the Southern Association down to 17 per cent in the Northwestern Association. Four schools on the Atlantic seaboard and three in the Middle West devoted 50 per cent of their test items to grammar. The major interest in the tests as a whole, however, is not in how much students know about technical grammar, but "lies in requiring on the part of entering student actual evidence of ability to use language effectively."\(^{31}\)

Litsey, discussing the trend in college placement tests, some twenty years after Smith and McCullough, made a similar observation—namely, that the colleges and universities are emphasizing the need to use language clearly and effectively. He also points out, "The ability to classify forms in grammatical terms is being de-emphasized almost to the point of negation."\(^{32}\)

In 1933, Litsey observed, more than sixty-five per cent of the items in objective tests measured ability in grammatical usage, spelling, and the elements of punctuation. The percentage had risen by 1953 to approximately eighty per cent. The tests reveal less concern with the niceties of diction and punctuation in expression."\(^{33}\)

In discussing the value of the essay examination Litsey notes that because of its uneconomical nature plus the difficulty of securing qualified readers the essay is used more frequently in small institutions.

\(^{31}\)Ibid., pp. 17-25.


\(^{33}\)Ibid., pp. 250-256.
Edith M. Huddleston observed that one of the fundamental controversies in the history of testing has been the controversy over the relative merits of objective vs. subjective measuring techniques. The essay test had been thought of as the most direct approach to important goals. However, as far back as the 1880's it was realized that this type of test was unreliable. Early studies showed discrepancy among teachers' marks, and many studies since have confirmed the fact.34

A review of the literature indicates that the unreliability of essay examinations is most pronounced in the area of English composition. In 1947 Adkins wrote, "Essay tests, no matter what their merits may be, are commonly considered impractical if the number of subjects is at all sizeable because of the time required to score them."35

Huddleston noted, "The reliabilities of the objective English section (.73) and of the Verbal test (.96) are satisfactory. From the viewpoint of reliability and entire hour devoted to Objective English would be highly satisfactory yielding a coefficient of .91 for an unspeeded test.

The reader reliability of the Essay question was .62. This is unsatisfactory particularly in view of the fact that the true reliability must necessarily be lower."36


36 Ibid., pp. 165-213.
The consensus of the writers of the literature reviewed has been that the high school student should be prepared to express ideas in writing and speaking with reasonable ease and competence.

Rosemary Smith conducted a study at the University of Colorado in which she compared the effectiveness of drill in mechanics with practice in writing as preparation and achievement on the English placement test.37 The University of Colorado places its entering freshmen in freshman English courses according to their achievement on the placement test. Excluded from this study were freshmen who did exceptionally well and therefore were permitted to omit the regular first quarter classes. Included in the study were sub-freshmen and regular first quarter English classes.

During the fall of 1950, the two experimental groups at the University of Colorado filled out questionnaires describing the amount and kind of preparation they had received in their senior year in high school and an estimate of English preparation in previous high school years. An analysis of the 713 questionnaires revealed

1. The majority of students had had more drill in mechanics than practice in writing. The percentage of students with drill in mechanics was slightly higher than that of students who had had equal practice in both, but almost twice as great as the per cent of students who had had a greater amount of practice in writing than in drill in mechanics.38

2. A comparison of the extreme groups (those having had drill in mechanics daily for a year and those having had practice in writing at least once a week during the year) revealed that a

38 Ibid., pp. 90-93.
a greater proportion of the students placed in sub-freshman English (25.2 per cent) than in regular freshman English (21.8 per cent) had had a greater amount of drill, that a greater proportion of the students placed in regular English (39.0 per cent) than in sub-freshman English (29.0 per cent) had had a greater amount of writing. 39

"The major conclusion of the study", according to Smith, "is that practice in writing is more effective than drill in mechanics for freshman English at the University of Colorado." The author also notes, "That practice in writing may be superior to drill in mechanics as preparation for student who rank fairly low in scholastic aptitude." 40

The literature reviewed was largely related to particular colleges or schools and was, therefore, of primary importance and interest to the schools in which the study was conducted. While the reviews relate, as was noted before, to placement of freshmen in English courses, predictive values of the ACE tests, the Cooperative English Tests, and other tests measuring aptitude and achievement, the relationship between academic aptitude and achievement was consistent throughout the review. For this reason these readings were pertinent to the primary purpose of this study.

39 Ibid., pp. 90-93.
40 Ibid., pp. 90-93.
CHAPTER III

METHODS OF PROCEDURE

The study to be described in the following pages consisted of the statistical correlations of raw scores earned by freshmen students from Butte Public High School on both the ACE and the Cooperative Mechanics and Effectiveness Tests which are subdivisions of the English test. In this chapter will be presented an account of the materials used and the procedures adopted.

Description of the ACE. "The purpose of the ACE test", according to the author, "is to appraise what has been called scholastic aptitude or general intelligence with special reference to the requirements of most college curricula."¹

The examination is so constructed as to yield a Total (T) score and two separate subscores — namely, a subscore for three linguistic tests and another subscore for three quantitative tests.² The authors state that all of the tests have been included in several test experiments with factorial analysis to determine the primary mental abilities.³

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²Ibid., p. 2.

The grouping of the six tests in two general classes is as follows:

Quantitative Tests (T Score)
- Arithmetic Reasoning
- Number Series
- Figure Analogies

Linguistic Tests (L Score)
- Same - Opposite
- Completion
- Verbal Analogies

According to the authors the scores show roughly the mental alertness of the student, but "they should not be thought of as measuring mentality with high accuracy".  

Mental ages and intelligent quotients do not exist for these tests in the range of college students because, as stated by the authors, college students are assumed to score above the average for adult population of the country, and, consequently, they cannot be assigned any mental ages for intelligent quotients.

The Thurstones state that norms should be given in terms of percentile ranks or standard scores for a given group.  

Super states that the reliability has been consistently high. Describing the contents of the tests, he notes, "The items are probably less affected by knowledge than those in most group tests, for the emphasis in selecting items was to choose those which

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measure ability to manipulate symbols rather than mastery of previously learned facts. 7

In the artificial language test, for example, the subject is given a new vocabulary into which he must make translations, and in the analogies test he must pick out similarities and differences in unfamiliar symbols and forms. 8

These tests and items have been selected and modified from earlier tests and tried out over a period of nearly twenty years on a large number of subjects. With adequate funds for necessary research, they constitute an unusually valid and reliable instrument.

Description of the Cooperative English Test. The Cooperative English Test is made up of three separate tests: reading comprehension, mechanics of expression, and effectiveness of expression.

Pooley describes the tests as follows:

The test Reading Comprehension contains two parts: vocabulary — meaning tested by five choices one of which is a synonym of the given word, and speed and level of comprehension tested by responses to 17 brief reading selections drawn from widely different sources, informational, scientific, and literary. The test Mechanics of Expression contains 60 items of grammatical usage placed in sentences, 40 items of punctuation, and 24 items of capitalization, the latter two types presented in running prose. Spelling is presented in 60 items, each in a choice between a misspelled and a correctly spelled word. The test Effectiveness of Expression contains three parts. Part I measures sentence structure and style by the comparison of passages of prose placed in parallel columns and by an exercise in the choice among four versions of the same

8 Ibid., p. 117.
sentence. Part II is a test of active vocabulary in which the student must guess the word intended by definition and by clues to the first word and length of the word. Part III measures organization by rearranging disorganized paragraphs and by completing a partial outline. 9

In commenting on the test, Pooley says that the materials are well-chosen and clearly presented, the directions simple and concise. Dubious and controversial matter has been avoided. 10

Since Mechanics of Expression and Effectiveness of Expression were the parts of the Cooperative English Test used in this study, it was deemed advisable to discuss the two parts of the test at greater length.

Harris, in reviewing the Cooperative English Test, notes that the test of Mechanics of Expression measures directly such skills as proof reading, error location, and criticism of written materials. He asserts that such skills may be important in their own right and as such constitute legitimate educational objectives, and that such skills may be related to the ability to use English effectively in speech and writing. 11

Harris continues,

The Cooperative English Expression Tests provide objective measures of many of the various factors entering into composition ability. In developing the outline for the tests, an analysis was made of the different types of skill and knowledge which go to make up the complex of ability to express

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10Ibid., p. 115.

oneself in English, and the tests were organized so as to
measure as many of these types as possible. The tests should,
therefore, provide reasonably and accurate measures of the
factors involved in written expression.\textsuperscript{12}

Pooley considers the test one of the best in the field of
English. The materials are well chosen and clearly presented. The
directions are simple and concise, the materials have been cast into
natural settings and paragraphs. Mechanics are tested functionally,
rather than in isolation from English expression.\textsuperscript{13}

The population. The subjects used in this study consisted of
students who were graduates of Butte Public High School and who
entered Montana State University in the fall quarters from 1943 to
1956. Those students for whom scores were not available on both
the ACE and the Cooperative English Tests were omitted in order that
the same number of cases might be used for the entire study. Three
students were thus eliminated, leaving 188 cases which were considered.

Gathering data. Lists of names of graduates were obtained
from the Admissions Office at Montana State University and from the
office of the Butte High School. Records of the results of the ACE
and Cooperative English Tests were secured from the individual test
record cards on file in the Counseling Center at the University.
These records showed for each student a percentile and a raw score for
the ACE Test, and a percentile, raw score and scaled score for the
Cooperative English Examination.

\textsuperscript{12}Ibid., p. 156.
\textsuperscript{13}Ibid., p. 120.
Raw scores for the Linguistic and Total ACE Tests for each individual were entered on charts. On the same charts the records of raw scores for the Mechanics and Effectiveness Tests were entered.

Statistical procedures. Frequency scores were noted for each of the four tests in order to determine the assumed mean. The intervals for the frequencies were placed at ten for all tests excepting the Effectiveness test. Here because of the narrow range from high score to low score, the interval chosen was five. Means and standard deviations were then computed according to the following formulas.

\[ M = \mu + 1 \left( \frac{\sigma_f x}{n} \right) \]

\[ \sigma = \sqrt{\frac{1}{N} \sum_{i=1}^{n} \sigma_f x_i^2} \]

Because raw scores on one test are usually not comparable with raw scores on another test, it was necessary to use a derived score. In this case the T score was used. T scores were computed by Dr. Bert R. Sappenfield.¹⁴

\[ T \text{ score} = \left\{ \frac{10}{\sigma} \right\} (X - M) + 50 \]

(The X was the low raw score).

\[ T \text{ score} = \left\{ \frac{10}{\sigma} \right\} (X - M) + 50 \]

(The X in this case was the high raw score).

The rate in each case was determined by the formula \( \frac{10}{\sigma} \).

A table was then formed. The low T score was entered in the cell of the table corresponding to the lowest raw score.

To obtain each successive score, the rate was added to the value already reached and each new value was entered in the proper cell of the table. This process of accumulating the "rate" until the high T score was reached was continued.¹⁵

The Pearson correlations, means, and standard deviations were computed from the formula on the scattergram.

The standard error of the mean of each measure, the standard error of the difference between means of pairs of measures, and the t test of the significance of the difference between means were computed according to the following formulas advocated by Guilford.¹⁶

\[ \sigma_{M} = \sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2 - 2r_{12} \sigma_{M_1} \sigma_{M_2}} \]

\[ t = \frac{M_1 - M_2}{\sigma_{M_2}} \text{(A t ratio for difference between means)}\]¹⁷

For ease of reference the mean, the standard deviation, and the standard error of the mean for each measure are recorded in Table I. Table II contains the statistics relative to the correlations and to the t tests and differences in the means between the pairs of measures. Tables III through VII, as shown in Appendix A, reflect the statistics

¹⁵Ibid., pp. 68-69.


¹⁷Ibid., p. 214.
### TABLE I

The mean, standard deviation, and standard error of the mean for ACE on test and mechanics of expression and effectiveness of expression.

<table>
<thead>
<tr>
<th>Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error of the Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE - TOTAL</td>
<td>49.74</td>
<td>10.80</td>
<td>.79</td>
</tr>
<tr>
<td>ACE - Linguistic</td>
<td>49.15</td>
<td>10.77</td>
<td>.79</td>
</tr>
<tr>
<td>Mechanics of Expression</td>
<td>50.68</td>
<td>14.35</td>
<td>1.06</td>
</tr>
<tr>
<td>Effectiveness of Expression</td>
<td>54.07</td>
<td>9.96</td>
<td>.73</td>
</tr>
</tbody>
</table>

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TABLE II

CORRELATIONS AND T SCORES FOR ACE TESTS AND THE MECHANICS OF EXPRESSION AND THE EFFECTIVENESS OF EXPRESSION TEST

<table>
<thead>
<tr>
<th></th>
<th>Mechanics of Expression</th>
<th></th>
<th>Effectiveness of Expression</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>t</td>
<td>r</td>
<td>t</td>
</tr>
<tr>
<td>ACE Total</td>
<td>.62</td>
<td>.23</td>
<td>.68</td>
<td>5.77</td>
</tr>
<tr>
<td>ACE Linguistic</td>
<td>.58</td>
<td>.97</td>
<td>.67</td>
<td>8.07</td>
</tr>
<tr>
<td>Mechanics of Expression</td>
<td>.61</td>
<td>.61</td>
<td>.61</td>
<td>4.85</td>
</tr>
</tbody>
</table>

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Pertinent to the particular pairs of measures which were studied.

As noted in Table I, the mean level of performance for the subject group was higher on the Effectiveness of the Expression Test than on any one of the other three measures. The mean scores attained by the students on these three tests were so nearly equal that there is probably no significant difference between any pairs of them.

Table II shows that scores obtained on both parts of the ACE were more closely related to the scores obtained on the Effectiveness of Expression Test than on the Mechanics of Expression Test. The mean scores on the Mechanics of Expression Test was more similar to the mean scores on the ACE tests than was the mean score on the Effectiveness of Expression Test.
CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary. This study was an attempt to determine whether certain graduates of Butte Public High School exhibited a significant difference in performance on tests of effectiveness of expression and mechanics of expression at the college level. A secondary purpose of the study was to attempt to determine the degree of relationship between measured general academic ability and performance in areas of mechanics and effectiveness of expression.

Pearson $r$ correlations, means, and standard deviations were computed from the formula on the scattergrams.

Formulas advocated by Guilford were computed to find the standard error of the difference between means of pairs of measure, and to find the t-test of the significance of the difference between the means.

Conclusions. An indication of the study was to the effect that mechanics of expression may have been stressed in the instruction of English at the Butte Public High School to the possible neglect of instruction in the effectiveness of expression. However, 188 graduates of that school who later enrolled as freshmen at Montana State University showed greater proficiency as a group on the test purported to measure effectiveness of expression than they did on a test purported to measure mechanics of expression. Moreover, the average performance of the group
on the test of general academic ability was closer to its average performance on a test of mechanics of expression than on its average performance on a test of effectiveness of expression. However, the performance of the group as indicated by coefficients of correlation on the test of general academic ability as well as on the sub-test of verbal ability was more closely related to its performance on the test of effectiveness of expression than on the test of mechanics of expression.

Instruction in mechanics of expression may have resulted in increased proficiency in effectiveness of expression, eventually making for greater skill in effectiveness of expression than in mechanics of expression.

General academic aptitude may have been more closely related to mechanics of expression than was verbal aptitude alone, while general academic aptitude and verbal aptitude were almost equally as well related to effectiveness of expression.

Recommendations. The implications of this study should be to direct the emphasis in high school English to the main objective of composition — the ability to express ideas in writing.

A great amount of practice in writing may be at least as effective as is drill in mechanics in preparing high school students for college; therefore, a considerable work in pure composition should be stressed as part of the high school program.

However, mechanics of expression and the learning of grammar need not be neglected to the point of oblivion — rather for the student they should become a vital aid in attaining greater skill in writing.

The study would seem to indicate that improvement in written composition would come as a result of an enrichment of the program.
Need for further study. To further study the effectiveness of composition as shown by these students on the Effectiveness of Expression Test, and grades on themes which were administered as part of the entrance test, correlations between theme grades and Effectiveness of Expression Tests might be computed.

An attempt might be made to determine why there was greater variability on the Mechanics of Expression Tests than there was on the Effectiveness of Expression Tests, by studying two extremes of the population - namely, those who have performed exceptionally well, and those who have not performed as well as the average, both on aptitude and English tests.

Too, the results of the ACE tests, the Effectiveness of Expression Test, and the Mechanics of Expression Test might be correlated with grades these students received in English at the end of the first or second quarter at Montana State University.

To complete the study, norms for the University population might be established and correlated with scores made by the group on both the ACE Tests and the Cooperative English Tests of Mechanics and Effectiveness of Expression.
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BIBLIOGRAPHY

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Traxler, Arthur E. "What Is a Satisfactory I... for Admission to College?" School and Society, 51:462-4, April 6, 1940.


C. ENCYCLOPEDIA ARTICLES


D. BULLETINS


**TABLE III**

**THE MEAN, STANDARD DEVIATION AND STANDARD ERROR OF THE MEAN FOR THE ACE - TOTAL TEST AND MECHANICS OF EXPRESSION TEST**

<table>
<thead>
<tr>
<th></th>
<th>ACE TOTAL TEST</th>
<th>MECHANICS OF EXPRESSION TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>188</td>
<td>188</td>
</tr>
<tr>
<td>Mean (M)</td>
<td>49.74</td>
<td>50.00</td>
</tr>
<tr>
<td>Standard deviation (sigma)</td>
<td>10.80</td>
<td>14.55</td>
</tr>
<tr>
<td>Standard error of the Mean</td>
<td>.79</td>
<td>1.06</td>
</tr>
<tr>
<td>Standard error of difference of means (sigma dₜ)</td>
<td>1.11</td>
<td></td>
</tr>
<tr>
<td>Difference of means (DM)</td>
<td>.26</td>
<td></td>
</tr>
<tr>
<td>t ratio (t)</td>
<td>.23</td>
<td></td>
</tr>
<tr>
<td>Coefficient of correlation (r)</td>
<td>.62</td>
<td></td>
</tr>
</tbody>
</table>
### Table IV

The mean, standard deviations and standard error of the mean for the ACE - Linguistic test and the Mechanics of Expression test.

<table>
<thead>
<tr>
<th></th>
<th>ACE - Linguistic Test</th>
<th>Mechanics of Expression Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>183</td>
<td>188</td>
</tr>
<tr>
<td>Mean (M)</td>
<td>49.15</td>
<td>50.00</td>
</tr>
<tr>
<td>Standard deviation ((\sigma))</td>
<td>10.77</td>
<td>14.55</td>
</tr>
<tr>
<td>Standard error of the Mean ((\sigma_m))</td>
<td>.79</td>
<td>1.06</td>
</tr>
<tr>
<td>Standard errors of difference of means ((\sigma_d))</td>
<td>.61</td>
<td></td>
</tr>
<tr>
<td>Difference of means ((\Delta M))</td>
<td>8.07*</td>
<td></td>
</tr>
<tr>
<td>T ratio (t)</td>
<td>.67</td>
<td></td>
</tr>
<tr>
<td>Coefficient of correlation (r)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at the 1% level of confidence or higher
TABLE V

THE MEAN, STANDARD DEVIATION AND STANDARD ERROR OF
THE MEAN FOR THE ACE - TOTAL TEST AND THE
EFFECTIVENESS OF EXPRESSION TEST

<table>
<thead>
<tr>
<th></th>
<th>ACE TOTAL TEST</th>
<th>MECHANICS OF EXPRESSION TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>166</td>
<td>168</td>
</tr>
<tr>
<td>Mean (M)</td>
<td>49.74</td>
<td>94.07</td>
</tr>
<tr>
<td>Standard deviation (sigma)</td>
<td>10.50</td>
<td>9.26</td>
</tr>
<tr>
<td>Standard error of the Mean</td>
<td>.79</td>
<td>.73</td>
</tr>
<tr>
<td>(sigma M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard error of difference of means (sigma d.)</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>Difference of means (DM)</td>
<td>4.33</td>
<td></td>
</tr>
<tr>
<td>t ratio (t)</td>
<td>5.77*</td>
<td></td>
</tr>
<tr>
<td>Coefficient of correlation (r)</td>
<td>.63</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 1% level of confidence or higher
### TABLE VI

The mean, standard deviation, and standard error of the mean for the ACE - Linguistic Test and the Effectiveness of Expression Test.

<table>
<thead>
<tr>
<th></th>
<th>188</th>
<th>188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ($\bar{X}$)</td>
<td>49.15</td>
<td>54.07</td>
</tr>
<tr>
<td>Standard deviation ($\sigma$)</td>
<td>10.77</td>
<td>9.96</td>
</tr>
<tr>
<td>Standard error of the Mean ($\sigma_{\bar{X}}$)</td>
<td>.79</td>
<td>.73</td>
</tr>
<tr>
<td>Standard error of difference of means ($\sigma_{\bar{X}_1 - \bar{X}_2}$)</td>
<td>.61</td>
<td></td>
</tr>
<tr>
<td>Difference of means ($\Delta \bar{X}$)</td>
<td>4.92</td>
<td></td>
</tr>
<tr>
<td>t ratio (t)</td>
<td>8.07*</td>
<td></td>
</tr>
<tr>
<td>Coefficient of correlation ($r$)</td>
<td>.67</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 1% level of confidence or higher.

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TABLE VII

THE MEAN, STANDARD DEVIATION, AND STANDARD ERROR OF
THE MEAN FOR THE MECHANICS OF EXPRESSION TEST
AND THE EFFECTIVENESS OF EXPRESSION TEST

<table>
<thead>
<tr>
<th></th>
<th>MECHANICS OF EXPRESSION TEST</th>
<th>EFFECTIVENESS OF EXPRESSION TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cases</td>
<td>188</td>
<td>188</td>
</tr>
<tr>
<td>Mean (( M ))</td>
<td>50</td>
<td>24.07</td>
</tr>
<tr>
<td>Standard deviation (( \sigma ))</td>
<td>14.55</td>
<td>9.96</td>
</tr>
<tr>
<td>Standard error of the Mean (( \sigma_m ))</td>
<td>1.06</td>
<td>0.73</td>
</tr>
<tr>
<td>Standard errors of difference of means (( \sigma_d ))</td>
<td>.84</td>
<td></td>
</tr>
<tr>
<td>Difference of means (( D ))</td>
<td>4.07</td>
<td></td>
</tr>
<tr>
<td>t ratio (( t ))</td>
<td>4.83*</td>
<td></td>
</tr>
<tr>
<td>coefficient of correlation (( r ))</td>
<td>.61</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 1% level of confidence or higher