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The Relationship Between Grade Point Averages of the Henmon-Nelson Test of Mental Ability and the American College Test

Eda Alene Hansen

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THE RELATIONSHIP BETWEEN GRADE POINT AVERAGES
OF THE HENMON-NELSON TEST OF MENTAL ABILITY
AND THE AMERICAN COLLEGE TEST

by

Eda Alene Hansen

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Guidance

UTAH STATE UNIVERSITY
Logan, Utah

1968
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Eda Alene Hansen
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Purposes of grading</td>
<td>1</td>
</tr>
<tr>
<td>Factors considered in grading</td>
<td>1</td>
</tr>
<tr>
<td>Logan High School's grading policy</td>
<td>2</td>
</tr>
<tr>
<td>Objectives</td>
<td>4</td>
</tr>
<tr>
<td>REVIEW OF LITERATURE</td>
<td>5</td>
</tr>
<tr>
<td>Related studies</td>
<td>5</td>
</tr>
<tr>
<td>Review of the Henmon-Nelson Test of Mental Maturity</td>
<td>9</td>
</tr>
<tr>
<td>Review of the American College Test</td>
<td>11</td>
</tr>
<tr>
<td>PROCEDURE</td>
<td>15</td>
</tr>
<tr>
<td>Sampling subjects</td>
<td>15</td>
</tr>
<tr>
<td>Required subjects</td>
<td>15</td>
</tr>
<tr>
<td>Academic elective subjects</td>
<td>16</td>
</tr>
<tr>
<td>Other elective subjects</td>
<td>16</td>
</tr>
<tr>
<td>Statistical procedure</td>
<td>16</td>
</tr>
<tr>
<td>RESULTS</td>
<td>18</td>
</tr>
<tr>
<td>A and B grades in required subjects</td>
<td>18</td>
</tr>
<tr>
<td>A and B grades in subject areas</td>
<td>19</td>
</tr>
<tr>
<td>Grade point averages in the top and bottom 25 percent</td>
<td>19</td>
</tr>
<tr>
<td>Correlations for the required subjects and the Henmon-Nelson Test of Mental Ability</td>
<td>20</td>
</tr>
<tr>
<td>Correlations for subject areas and the Henmon-Nelson Test of Mental Ability</td>
<td>20</td>
</tr>
<tr>
<td>Correlations for required subjects and the American College Test</td>
<td>21</td>
</tr>
<tr>
<td>Correlations for subject areas and the American College Test</td>
<td>21</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>22</td>
</tr>
<tr>
<td>Grading in the required subjects</td>
<td>23</td>
</tr>
<tr>
<td>Grading in the academic elective subjects</td>
<td>25</td>
</tr>
<tr>
<td>Grading in the other elective subjects</td>
<td>25</td>
</tr>
<tr>
<td>Correlations with the Henmon-Nelson Test of Mental Maturity</td>
<td>27</td>
</tr>
<tr>
<td>Correlations with the American College Test</td>
<td>28</td>
</tr>
<tr>
<td>SUMMARY AND CONCLUSIONS</td>
<td>30</td>
</tr>
<tr>
<td>RECOMMENDATIONS</td>
<td>32</td>
</tr>
<tr>
<td>LITERATURE CITED</td>
<td>33</td>
</tr>
<tr>
<td>TABLE OF CONTENTS (Continued)</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>VITA</strong></td>
<td><strong>Page</strong></td>
</tr>
<tr>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Distribution of graduates by year and sex</td>
<td>15</td>
</tr>
<tr>
<td>2. Percent of A and B grades in required subjects for graduates</td>
<td>18</td>
</tr>
<tr>
<td>3. Percent of A and B grades in the three subject areas for graduates</td>
<td>19</td>
</tr>
<tr>
<td>4. Grade point averages for the three subject areas in the bottom 25 percent and top 25 percent of each class</td>
<td>19</td>
</tr>
<tr>
<td>5. Correlations between scores on the Henmon-Nelson Test and grade point averages in required subjects</td>
<td>20</td>
</tr>
<tr>
<td>6. Correlations between scores on the Henmon-Nelson Test and the average grade point for the three subject areas, and the three subject areas combined</td>
<td>20</td>
</tr>
<tr>
<td>7. Correlations between scores on the American College Test and grade point averages for required subjects</td>
<td>21</td>
</tr>
<tr>
<td>8. Correlations between scores on the American College Test and grade point averages for the three subject areas and the three subject areas combined</td>
<td>21</td>
</tr>
</tbody>
</table>
ABSTRACT

The Relationship Between Grade Point Averages of the Henmon-Nelson Test of Mental Ability and the American College Test

by

Eda Alene Hansen, Master of Science

Utah State University, 1968

Major Professor: Dr. Heber C. Sharp
Department: Psychology

Grading within a single school was studied by comparing the grades with the policy of grading recommended by the high school, and the relationship between the grades and two tests administered by the school.

Six hundred fifty-five graduates from the 1964, 1965 and 1966 graduating classes made up the sample. The grades used were those received during their three years in high school. The tests were the Henmon-Nelson Test of Mental Ability administered in the tenth grade and the American College Test which was taken in the twelfth grade. The Pearson r Correlation Coefficient was used to make the correlations.

The number of A and B grades given in all subject areas were beyond that recommended by the school policy. A t test showed the differences in grading between required subjects and nonacademic elective subjects in the lower 25 percent of each graduating class to be significant at the .01 percent level. In the upper 25 percent the differences were not significant. The required subjects area grades correlated highest with scores from both tests.

42 pages
INTRODUCTION

One of the activities teachers like least is the assigning of school grades. The grade is a comparable indication of the degree of success a student has achieved in a subject in relation to his peers as appraised by the teacher. It should be determined mainly on the student's performance in class and on subject matter tests. It should not only indicate the student's position in a grading scale with the class but should place him within the range he would attain if compared to the same school grade population at his own and other comparable schools.

The purpose of grading might be grouped under three headings: administration, information and motivation. Korey lists the purposes of grading:

1. Evidence of completion, in part, of a graduation requirement
2. Basis for guidance in continuing, dropping or modifying the same course in future terms
3. Eligibility for admission to a class subject
4. Eligibility for summer school
5. Guide to the student as to teacher requirements and his own progress
6. Information for parents
7. Evidence for college admission and/or scholarship awards. (Korey, 1966, p. 61)

Factors considered to be important in making up the grades differ from school to school and teacher to teacher. Terwilliger (1966) in a study made on 129 public high schools throughout the nation reported that 22 percent of the schools had no grading policy at all, 27 percent graded on an absolute standard of achievement, 29 percent on achievement with respect to ability and 16 percent in respect to achievement with others in the class.
A fundamental problem concerned the role, if any, of such factors as classroom behavior, absence, tardiness and effort. Forty percent of the administrators indicated their schools have policies regulating the reduction of grades for disciplinary or other reasons. Twenty percent of the teachers in each subject area report giving behavior, absence and/or tardiness either major or moderate consideration and 50 percent give the same consideration to effort. Yet, substantial numbers in certain subjects give little or no consideration to such factors.

Travers and Gronlund state:

In general, marks based on tests and examinations are likely to be more reliable and provide better measures of achievement than those based on other types of observation. Marks based on the observation of student's behavior in class are likely to be unrealistic because they are influenced too much by the student's personal characteristics such as his ability to co-operate, his general disposition and manner, and his ability to get along with the teacher. (Travers and Gronlund, 1950, p. 369)

The Logan High School Faculty Handbook (1967) for teachers states that in grading "primary consideration should be given to achievement, but that attendance, citizenship, cooperativeness, tardies, etc. should definitely be taken into account." What part of the school grade should come from the nonsubject matter factors is not definite. It seems that some teachers at Logan High School tend to be highly influenced in grading by these nonsubject attributes and others grade almost entirely on subject matter.

To add consistency to the grading at Logan High School the administrators in their handbook for teachers state:

... the average standard of ability varies some from one class to another but in general a guiding policy for grading will help establish a more uniform practice. Therefore, the faculty has adopted the following policy: in general not more than ten per cent "A's" should be given and not more than thirty-five per cent "A's" and "B's" together. (Logan Senior High School Faculty Handbook, 1967, p. 12)
According to this, the grading should be on a comparable basis from teacher to teacher and subject to subject. It would not, however, tend to be an accurate measure of the whole class or individual student's measurement when compared with the school grade population.

The five-point scale grading system used at Logan High School is one of the most common marking systems used in the public high schools. According to Jacobsen (1952) this scale using A, B, C, D and F will tend to measure the factual learning of the student because it is easier to measure.

Testing, as well as grading, is used as an instrument for appraisal, measurement and/or prediction. An achievement test measures the present level of mastery in a subject that has been attained as a result of specific instruction. The intelligence test seeks to measure those mental abilities which are valuable in almost any type of thinking and learning (Cronbach, 1960). The relationship of grades given can be compared to the scores obtained on these tests.

Administrators and teachers at Logan Senior High School are concerned about the grading. The purpose of this study was to analyze the grading of teachers within the school. Comparisons of grading within the school by subjects and subject areas was made. Grades were also correlated with the obtained scores on the Henmon-Nelson Test of Mental Ability and the American College Test.
The following hypotheses were tested.

1. That the number of A and B grades given in required subjects, academic elective subjects and other elective subjects would fall within the 35 percent range proposed by Logan Senior High School's grading policy.

2. That the top 25 percent in each graduating class and the bottom 25 percent would receive better grades in elective subjects than in required subjects.

3. That the correlation between the Henmon-Nelson Test of Mental Ability and the grade point averages for required subjects, academic elective subjects and other elective subjects would be significant.

4. That the correlation between the American College Test and the grade point average for required subjects, academic elective subjects and other elective subjects would be significant.
Grading is one of the ancient problems. Even when school functions and purposes were less complex in our society, it is doubtful that parents and students clearly understood what teachers were trying to communicate through grades. Today the problem is even more complex. Today's secondary teacher is faced with a dilemma at report periods. In recording the student's mark the primary concern is to maintain reasonable academic standards but, at the same time try to include in this rating such criteria as effort, attitudes, and achievement in terms of the student's potential ability to succeed (Alpren, 1960).

In reviewing the literature no studies were found in which comparisons of grades were made among high schools or within their departments. The articles reviewed focus essentially on the use of high school grades as predictors of college achievement. Therefore, the intent of this chapter is to (1) review studies done involving colleges and university populations in which high school grades have been used as a variable, (2) to review research on the Henmon-Nelson Test of Mental Maturity and, (3) to review research on the American College Test.

Lindquist (1963) suggests the differences in the meaning of grades from high school to high school may be smaller than was generally believed. Public high schools are usually nonselective and are community high schools. The range of intelligence is probably much the same from community to community and hence from high school to high school. It would seem likely that the difference in grading standards between high schools are those that exist within the individual school rather than
among schools. The difference in these standards that exist among
different instructors in the same department, or from department to
department in the same high school are perhaps as large as those from
one school to another.

Bloom and Peters state that even though high school grades have
consistently been found to be the best predictor of college success, the
predictions are still notably inaccurate.

Attempts to improve predictions from high school grades
have usually foundered because of variations in grading
standards. These differences are not whimsical deviations
of teachers and staffs. Schools and colleges serve different
populations and have different problems, different
programs, and different objectives. Within a school, such
differences may be minimal, and the meaning of each grade
may be relatively clear. When grades from a number of
schools or colleges are compared the differences may be
very great. (Bloom and Peters, 1961, p. 4)

Fensch (1966) states that the fact the bell shaped curve was not
intended for use with small groups doesn’t seem to be known by the
average teachers. Many administrators feel teachers should grade by
the bell curve.

Rugg (1915), after studying several thousand marks,
observed that distribution of teachers’ marks was not
normal but skewed. Even where symmetrical distributions
such as 7-24-38-24-7 or 5-20-50-20-5 have been imposed
by school policy or suggested from research . . . they
do not correspond to the 2.5-13.5-68-13.5-2.5 areas under
the normal curve of probability. The corrections for
individual differences in marking among teachers recom-
manded in many institutions, moreover, merely accentuate
the failure of distribution of teachers’ marks to con-
form truly to the normal curve. (Chansky, 1964, p. 96)

Two points to be considered in grading are that in a class of
normal distribution of abilities, reliance should be placed on a curve
of distribution of scores in determining grades and in a class of uneven
distribution of abilities an uneven distribution of grades would be
expected. Interpretations of the grades are kept up to date by the
teachers continually evaluating their interpretations of these expectations for students at the particular student's grade level in the nation (American School Board Journal, 1963).

There are several studies comparing the grade for individual subjects, subjects within a subject area, and all subjects combined as a predictor for future achievement. Scannell (1960) in his study showed the high school average for three years (grades 9-10-11) was as good a predictor of college performance as the high school average for four years. Gladfelter (1936) found the four year average a more accurate prediction of success in college than grades in particular subjects or groups of subjects. Elton (1966) found the difference, either positive or negative, not significant between average grade for the junior or senior year as a predictor for college success. Hills and Klock (1966) in their study with colleges which represented a variety of institutions of higher learning found there is not enough difference between the two multiple correlations for it to be worthwhile for the institution to go to the additional effort of defining which high school courses are academic. Gelso and Klock (1967) found no significant difference between correlations of (1) the averages of all academic courses in grades 9 through 12, (2) a three year high school average on all courses, (3) a four year high school average on all courses and, the college freshman average grade.

Willingham summarizes the feelings of the above studies with this statement.

In order to maximize accuracy and efficiency, it is desirable to express the student's high school performance in terms of a single index... The fact that no strong and consistent trend has emerged from the hundreds of published studies leads one to believe that it may make little practical difference how the high school record is summarized. (Willingham, 1964, p. 49-50, 54)
There are many studies in the literature using the high school average grade point as a variable of academic achievement. This involves translating letter grades into numerical grades. The numerical grades are added and then divided by the total number of courses to obtain the grade point average. The evidence accumulated over the years demonstrates past achievement to be the best predictor of future achievement.

Giusti (1964) in his study concerned with the relationship between high school average and college grade point average reported in synoptic form the findings of investigations made over the past three decades. His reasons for selecting and surveying the findings of these investigations are the evidence accumulated over the years that demonstrates past achievement to be the best predictor of future achievement; his belief that the best single predictor we have at our disposal is the high school average; and the hope others will be stimulated to investigate this predictive measure.

The most significant conclusion resulting from the exploration of the field of prediction studies is the unquestionable superiority and stability of the high school grade average as a single source of data for predicting college success. This seems to hold true whether the reports be of individual studies or of investigations involving the findings of groups of similar studies. The evidence is all the more convincing when the coefficients of correlation continue high, despite the many factors which make it difficult to reduce the material to a common denominator or comparable data. (Giusti, 1964, p. 200)

Several similar studies finding the high school grades to be the most effective predictor of college success were reported by Pierson (1958), Bloom and Peters (1961), Aiken (1962), McCormick and Asher (1964), Willingham (1964), Elton (1965), Elton (1966), Hills and Klock (1966), and, Gelso and Klock (1967).

The grade point average has several shortcomings. The grade, the essential ingredient of grade point average, has no inherent stable meaning according to Chansky (1964) who cites the following studies.
Odell (1928) listed 15 features teachers take into consideration before assigning a grade, such as, attitude toward work, degree of interest, final attainment, etc. Gronlund (1950) found six features. Among these were the student's ability to apply logical criticism, effort and writing skill. Battle (1954) revealed that a sizable portion of the grade could be explained by the student's congruence of his values with those of the teacher. Marshall (1958) believed that some teachers use the authority behind the grade to enforce discipline, cajole students to improve, to patronize students by giving grades like a theater manager hands out free passes, and others try to separate the good from the poor student by rigid marking practices.

Cronbach (1960) states that while high school grades usually predict better than mental tests it is hard to compare grades from different schools, especially small ones. In comparing students within the same class, the high correlation between tests of mental ability and achievement batteries means it makes little difference which we use. The test of general mental ability is usually more suitable for students coming from different educational backgrounds because it is not matched to any particular educational experience. A combination of high school grades with a group mental test commonly predicts college marks with a validity of .60 to .70. Achievement batteries can be substituted for the mental test as a predictor.

Tyler (1959) reviewed the Henmon-Nelson Test of Mental Ability, Revised Edition. It is a relatively short intelligence test yielding a single score. It has two forms which are similar in construction and difficulty. Each test is composed of 90 five-choice items arranged in order of difficulty without regard to the exact character of the items. Items include vocabulary, sentence completion, word classification,
logical selection, disarranged sentences, interpretation of proverbs, verb analogies, mixed spelling, series completion, design analogies and arithmetic reasoning. The content is heavily weighted with items measuring various types of verbal ability. However, the history of mental testing has indicated substantial correlations between such test content and scholastic success.

There are four levels of difficulty. The high school grade levels, 9 through 12, were pertinent to this study.

Evidence for congruent validity is presented in the form of correlations with the California Test of Mental Maturity. The correlations ranged from .71 to .83. Concurrent validity was established by correlations between Henmon-Nelson IQ's and achievement test scores. Tests used were the California Achievement Test and the Iowa Tests of Educational Development. The correlations for the three subtests of the California Achievement Test and the ten subtests of the Iowa Tests of Educational Development ranged from .62 to .84. Predictive validity data are not yet available for the Revision of the test. However, correlations between the Revision and school grades are reported even though the period between testing and grades was only a few months. The correlations between the Henmon-Nelson IQ's and composite average grades earned ranged from .60 to .70 (Examiners Manual, 1957).

The reliability coefficient was obtained by correlating the scores on the even numbered test items with the scores on the odd numbered items.

The 1957 Revision is well designed as a short measure of scholastic ability having reliability over .90, but considerable overlap with reading ability and no diagnostic features. (Cronbach, 1960, p. 230)
In his review, Lefever (1959) states that if a single predictor of school success is needed which can be given in less time than a class period and scored with a minimum of time and effort, the Herman-Nelson Test should be seriously considered. If guidance involving differentiations among aptitudes is needed, or a profile showing the strengths and weaknesses is desired, then a more complex test battery would be more appropriate. In the selection of such a test the correlations reported between the subtests and appropriate criteria of success (such as grades) should be examined with care to be sure that a sufficient gain in predictive ability is likely to counterbalance the greater cost in material, student time, scoring time and the greater knowledge required for interpretation.

The American College Testing program was chartered in 1959. Its rate of growth has been very rapid. In 1961 over 700 colleges or universities recommended or required the tests. More than 100 institutions joined the program in 1962. But, in spite of the rapid growth very little data on the American College Test can be found in the professional journals (Foster and Danskin, 1965).

According to Engelhard (1965) in his review the test is a combination of four subtests having 224 items. The three hour test battery is administered on four Saturdays in February, April, June and November. After each testing reports of scores are sent to three colleges designated by the student. Two reports go to the high school, one for the school and one for the student. A college participating in the American College Test Research Service receives predictive grade indices for English, mathematics, social studies, natural science and the overall grade point average of each prospective student based on weighted
combinations of the student's American College Test scores and his junior year high school course marks in the same areas.

Buros (1965) reviews the four subtests:

The first test in English measures the student's educational development in understanding the basic elements in correct and effective writing, punctuation, capitalization, diction, phraseology, and organization. It measures the student's ability to put his English language knowledge to use.

The second test in mathematics measures the student's educational development in using arithmetical and mathematical principles in the solution of practical quantitative problems and in the interpretation of graphs and charts.

Test three in social studies measures the student's educational development in the ability to interpret and evaluate reading selections in the social studies and to do the types of reasoning and problem solving characteristic of social studies. It attempts to discriminate between students who have acquired a broad understanding of social principles and those who have not.

Test four in the natural sciences measures the student's educational development in the ability to interpret and evaluate reading materials in the natural sciences, and to do the kinds of reasoning characteristic of the natural sciences. It is designed to draw as heavily upon the student's science background as upon his ability to comprehend the content of the reading passages.

The composite score is the mean of the four educational development scores and is viewed as an index of the student's total educational development. The test is heavily weighted by materials which are learned
in school. Language skills and the ability to read and comprehend are of the utmost importance in the test.

The odd-even reliability coefficients of the four subtests were: English, .90; mathematics, .89; social studies, .86; and natural sciences, .83. The reliability of the composite standard score is .95. In standard score units, the standard errors of measurement are, respectively, 1.54, 2.13, 2.15, 2.45, and 1.03 (Conrad, Fricke and Finlay, p. 6).

Data from this achievement test is useful in admission of students, in placement, in guidance, in awarding scholarships or loans and in estimating levels of achievement to be expected of students after admission (ACT Program, Student's Booklet, 1966).

Even though there are a large number of factors to be taken into account in estimating the meaning of a given grade, it still remains a good indication of past achievement and predictor for future achievement. Whether parts of grades or all grades are used, or one year or more than one year, the difference doesn't appear to be significant. Because of the accuracy and efficiency of using a single index in research studies the grade point average has become widely used. The grades or grade point average can be correlated with test(s) scores to estimate the relationship between the two.

The Otis-Lennon Test measures the student's mental ability and helps in predicting success in academic work. The chief advantages of the test are the ease of administering and scoring, and the relatively small number of items which require only 30 minutes of the pupil's time. Yielding a single score, it may not offer much diagnostic help leading to remedial instruction.
The American College Test measures the student's educational development and is used mainly as a predictor for college success. It is a fairly new test but the number of colleges and universities using it have increased each year. This test places a high premium on the possession of a rich store of knowledge, although it does so indirectly rather than directly. Questions on the test do not call directly for specific information but test the student's ability to use whatever knowledge he possesses in the solution of complex problems.

The test seems to be an adequate predictor of academic success in college courses during the freshman year. In counseling, however, the relative suitability of a student for various majors would involve considerations beyond the American College Test information. These factors would be student goals, interests, values, personality characteristics, the colleges educational and training requirements and philosophies and the occupational opportunities.
PROCEDURE

Graduates from the 1964, 1965 and 1966 school years at Logan Senior High School were selected as subjects for this study. The total number of graduates for the three years was 655 (Table 1).

Table 1. Distribution of graduates by year and sex

<table>
<thead>
<tr>
<th></th>
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<th>Totals</th>
</tr>
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<tbody>
<tr>
<td>Boys</td>
<td>95</td>
<td>130</td>
<td>100</td>
<td>325</td>
</tr>
<tr>
<td>Girls</td>
<td>88</td>
<td>130</td>
<td>112</td>
<td>330</td>
</tr>
<tr>
<td>Totals</td>
<td>183</td>
<td>260</td>
<td>212</td>
<td>655</td>
</tr>
</tbody>
</table>

The classes offered were divided into three subject areas: the required classes, the academic elective and the other elective classes. Classes listed under each division are described below.

The required classes are taken by every student and a passing grade must be received in order to be eligible for graduation. These classes include:

Three units in the language arts area. These include English 10, 11, and 12 (full year) or 12A (one semester). Students taking 12A may obtain the remaining credit in the general area of the language arts (e.g. speech, foreign language, journalism, debate).

Two units in the social studies area. One unit must be in United States history and government. The other will be American Problems and must be completed in the senior year. Forensics may be used as the senior unit.
One unit in mathematics. Any class in mathematics will meet this requirement.

One unit in physical science. This may be either physics, chemistry, or zoology and botany. Biology is a prerequisite for zoology and botany. Zoology and botany to fill this requirement, must be taken during the junior or senior year.

One half unit in health and physiology, to be taken during the junior or senior year. (Student Guide, 1966, p. 19-20)

Academic elective classes are not required for graduation and a student, after meeting the class requirements may elect to take any other classes offered. Included in this area are journalism, speech, all foreign languages, all classes in the mathematics area, all classes in the sciences area and all classes in the social studies area that are not used to meet graduation requirements.

Other elective classes are those that are not listed in the required and academic elective groups. In this category are classes offered in the areas of arts and crafts, business education, homemaking, industrial arts and music.

R.O.T.C., sponsors and physical education classes were eliminated from the study because letter grades were not given in these subjects. Students receive a "P" for a passing grade and an "F" for a failure.

Letter grades received by each student were copied from the district's cumulative records for grades 10, 11 and 12. The letter grades were assigned a number from a 4-point scale. A's were given a value of 4 points, B's 3 points, C's 2 points and D's 1 point. Plus and minus signs by grades were not recorded. The grades were separated into their three areas; required, academic electives, and other electives, and transferred to sheets used to compile the information on grades.
Test scores on the Henmon-Nelson Test of Mental Ability were copied from the cumulative records for each student in the graduating classes. Students not having a score for the test, which was given in grade 10, were discarded from the study. This group would consist mainly of students transferring to Logan High School from other schools.

The American College Test is given in grade 12. This test is not compulsory. Generally, only students planning on continuing their education take the test. All scores available in the Logan District's cumulative records were used. The raw test scores copied on the two tests were converted to standard scores having a mean of 50 and a standard deviation of 10. The formula $SS = \frac{(x-\overline{x})}{s}(10)+50$ from Downie and Heath (1959, p. 61) was used.

To test hypothesis one the A and B grades given in each subject were added together and divided by the number of students taking that subject. This was repeated with the A and B grade point averages in the three subject areas.

To test hypothesis two the grade point averages in each of the three subject areas for the top 25 percent in each class were added and divided by the total number of grade scores. The same procedure was followed with the bottom 25 percent in each class.

To test hypothesis three each student's grade point average in the individual subjects and in the three subject areas were placed on scattergrams opposite the scores obtained on the Henmon-Nelson Test. The relationship between the scores was obtained by using the Pearson $r$ correlation coefficient.

To test hypothesis four the same method was used as was used for hypothesis number three, except, scores from the American College Test were placed opposite the grade point averages.
RESULTS

The final grades received in each subject for school grades 10, 11 and 12 were recorded for the 655 graduates. Comparisons between the percent of A and B grades received in the required subjects and the 35 percent recommended in the policy for grading at Logan High School are shown (Table 2).

Table 2. Percent of A and B grades in required subjects for graduates

<table>
<thead>
<tr>
<th>Year</th>
<th>English</th>
<th>Social studies</th>
<th>Mathematics</th>
<th>Physical science</th>
<th>Physiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>31</td>
<td>36</td>
<td>47</td>
<td>32</td>
<td>49</td>
</tr>
<tr>
<td>1965</td>
<td>34</td>
<td>41</td>
<td>40</td>
<td>35</td>
<td>48</td>
</tr>
<tr>
<td>1966</td>
<td>39</td>
<td>43</td>
<td>47</td>
<td>34</td>
<td>50</td>
</tr>
</tbody>
</table>

Physical science was the only area that graded according to the school policy. The English area did in 1964 and 1965 but had exceeded the maximum range by 4 percent in 1966.

The percent of A and B grades in the three subject areas show that none of the areas are grading as the school policy suggests (Table 3). The required subjects area came closest with a range from 39 to 43 percent, and the academic electives area was second with a range from 46 to 53 percent. The other electives area was last with 64 to 68 percent as their range.
Table 3. Percent of A and B grades in the three subject areas for graduates

<table>
<thead>
<tr>
<th>Year</th>
<th>Academic electives</th>
<th>Other electives</th>
<th>Required subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>51</td>
<td>64</td>
<td>39</td>
</tr>
<tr>
<td>1965</td>
<td>46</td>
<td>68</td>
<td>40</td>
</tr>
<tr>
<td>1966</td>
<td>53</td>
<td>65</td>
<td>43</td>
</tr>
</tbody>
</table>

It was theorized that the grade point averages would be higher in the elective classes than in the required classes. The comparison was made by figuring the grade point averages for the top and bottom 25 percent in each class (Table 4). A t test was made to determine if the differences in the grade point averages would be significant.

Table 4. Grade point averages for the three subject areas in the bottom 25 percent and top 25 percent of each class

<table>
<thead>
<tr>
<th>Year</th>
<th>Lower 25 percent</th>
<th>Upper 25 percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average grade point in each of the subject areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Academic electives</td>
<td>Other electives</td>
</tr>
<tr>
<td>1964</td>
<td>1.63</td>
<td>1.62</td>
</tr>
<tr>
<td>1965</td>
<td>1.62</td>
<td>1.52</td>
</tr>
<tr>
<td>1966</td>
<td>1.50</td>
<td>1.28</td>
</tr>
</tbody>
</table>

* t test significant at the .01 percent level.

The relationship between the score received on the Henmon-Nelson Test and the obtained grade point average in the required subjects for
the three high school years was computed by using the Pearson correlation coefficient (Table 5).

Table 5. Correlations between scores on the Henmon-Nelson Test and grade point averages in required subjects

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>English r</th>
<th>Mathematics r</th>
<th>Physics science r</th>
<th>Physiology r</th>
<th>Social studies r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>183</td>
<td>.57</td>
<td>.42</td>
<td>.55</td>
<td>.57</td>
<td>.55</td>
</tr>
<tr>
<td>1965</td>
<td>260</td>
<td>.64</td>
<td>.49</td>
<td>.66</td>
<td>.52</td>
<td>.57</td>
</tr>
<tr>
<td>1966</td>
<td>212</td>
<td>.55</td>
<td>.52</td>
<td>.52</td>
<td>.51</td>
<td>.54</td>
</tr>
</tbody>
</table>

r’s significant at the .01 percent level.

Correlations were computed using the Pearson r for the three subject areas and the three areas combined. Grade point averages and Henmon-Nelson Test scores were used to make the correlations (Table 6).

Table 6. Correlations between scores on the Henmon-Nelson Test and the average grade point for the three subject areas, and the three subject areas combined

<table>
<thead>
<tr>
<th>Year</th>
<th>Number graduates</th>
<th>Academic electives r</th>
<th>Other electives r</th>
<th>Required subjects r</th>
<th>Combined areas r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>183</td>
<td>.47a</td>
<td>.44</td>
<td>.59</td>
<td>.54</td>
</tr>
<tr>
<td>1965</td>
<td>260</td>
<td>.49b</td>
<td>.45c</td>
<td>.64</td>
<td>.59</td>
</tr>
<tr>
<td>1966</td>
<td>212</td>
<td>.51d</td>
<td>.37</td>
<td>.47</td>
<td>.51</td>
</tr>
</tbody>
</table>

r’s significant at the .01 percent level.

a 13 graduates did not take an academic elective class.
b 14 graduates did not take an academic elective class.
c 2 graduates did not take an other elective class.
d 24 graduates did not take an academic elective class.
The grade point averages used to find the correlations for tables 4 and 5 were used to make similar correlations with the American College Test (Table 7).

Table 7. Correlations between scores on the American College Test and grade point averages for required subjects

<table>
<thead>
<tr>
<th>Year tested</th>
<th>Number</th>
<th>English</th>
<th>Mathematics</th>
<th>Physical science</th>
<th>Physiology</th>
<th>Social studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>66</td>
<td>.72</td>
<td>.50</td>
<td>.80</td>
<td>.66</td>
<td>.67</td>
</tr>
<tr>
<td>1965</td>
<td>166</td>
<td>.60</td>
<td>.52</td>
<td>.70</td>
<td>.56</td>
<td>.57</td>
</tr>
<tr>
<td>1966</td>
<td>128</td>
<td>.50</td>
<td>.56</td>
<td>.94</td>
<td>.54</td>
<td>.57</td>
</tr>
</tbody>
</table>

r's significant at the .01 percent level.

Correlations for the three subject areas and the three areas combined are shown (Table 8).

Table 8. Correlations between scores on the American College Test and grade point averages for the three subject areas and the three subject areas combined

<table>
<thead>
<tr>
<th>Year tested</th>
<th>Number</th>
<th>Academic electives</th>
<th>Other electives</th>
<th>Required subjects</th>
<th>Combined areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>66</td>
<td>.46</td>
<td>.42</td>
<td>.73</td>
<td>.59</td>
</tr>
<tr>
<td>1965</td>
<td>166</td>
<td>.37\textsuperscript{a}</td>
<td>.43</td>
<td>.64</td>
<td>.57</td>
</tr>
<tr>
<td>1966</td>
<td>128</td>
<td>.32\textsuperscript{b}</td>
<td>.30</td>
<td>.66</td>
<td>.47</td>
</tr>
</tbody>
</table>

r's significant at the .01 percent level.
\textsuperscript{a} 8 graduates did not take an academic elective class.
\textsuperscript{b} 13 graduates did not take an academic elective class.
DISCUSSION

A continual problem for teachers in the secondary school has been that of issuing grades. Factors considered to be important in making up the grades differed among schools and teachers. As reported in an earlier chapter, some schools had no grading policy, some graded on an absolute standard of achievement, some on achievement with respect to ability and some with respect to achievement with others in the class. A fundamental problem concerned the role of such factors as classroom behavior, absence, tardiness, effort, etc. Many teachers gave considerable consideration to such factors while other teachers gave none (Terwilliger, 1966).

The general policy established for teachers in the Logan Senior High School stated such factors as those mentioned above should definitely be taken into account. It also suggested that not more than 35 percent A and B grades should be given in any one class.

The purpose of this investigation has been to study the grading at Logan Senior High School by (1) comparing grades given by teachers with the policy of grading recommended by the administrators, (2) comparing the grades given in the required subjects with those given in the elective subjects for the top and bottom 25 percent of each graduating class, (3) to study the relationship between the grades received and scores obtained on the Henmon-Nelson Test of Mental Ability, and (4) to study the relationship between the grades received and scores obtained on the American College Test.
The distribution of A and B grades, table 2, shows considerable variation among the required subjects within the required subject area. These variations among different areas would support Lindquist (1963) who suggested that the differences in grading that exist from department to department in the same high school are perhaps as large as those existing from one school to another. Other studies supporting this finding have been made by Odell (1928), Gronlund (1950), Battle (1954), and Marshall (1958).

This finding challenges Bloom and Peters (1961) who state that within a school the differences in grading may be minimal.

Physical science was the only area to grade within the proposed range of 35 percent A and B grades for the three years studied. This area included one unit in either physics or chemistry, or one-half unit in zoology and one-half unit in botany.

The English area graded according to the school policy in 1964 and 1965 but had exceeded the recommended maximum range 4 percent in 1966. Classes used to fill this requirement are the three regular English classes. In grade 12, one semester of English 12A and one semester of speech, foreign language, journalism or debate may be counted. Journalism and debate are considered special classes. Students in these two classes enroll by permission of the instructor. The number interested and enrolled in debate has grown continuously because of the success achieved by the debaters at the school. And generally, only A and B grades are given in these two classes. In grade 12, the grades in some English classes are figured in comparison with the scores obtained on the National Merit Scholarship Test. If students score high on the test then a greater percentage of A and B grades are given than is recommended by the grading policy. Students taking their second year in a foreign
language are considered to be in an advanced language class and grade distributions are positively skewed.

Two units are required in the social studies area. One unit may be in American History or Government and the other in American Problems which is taken the senior year. Forensics, or debate, may be used to fill the senior year requirement. As stated in the preceding paragraph, only A and B grades are generally given in Forensics. Also, not listed in the handbook is the United Nations Club, a class offered under the title of American Problems. This is also a special class and only A and B grades are generally given.

In mathematics any class may be used to fill the requirement. The consumer mathematics class is tagged by most students as a "class for the dummies" and carries somewhat of a social stigma. The grades given in the consumer mathematics classes are negatively skewed while those in the advanced mathematics classes are positively skewed. A high percentage of the students take algebra in the ninth grade and fill the requirement with an advanced mathematics class. The majority of students taking classes such as geometry, trigonometry and calculus are students with a high mathematical ability and the grades in these classes are mostly A's and B's. Three full time instructors are needed to meet the demand for enrollment in this area. This would verify the fact that advanced work in mathematics is being done by a considerable number of students and would account, in part, for the increased percentage in the number of A and B grades.

Physiology and Health is a semester course taken during the junior or senior year. There are no other classes which may be substituted to fill the requirement. Therefore, there could be no explanation found by
the writer to account for not grading according to the policy recommended by the school.

Some teachers grade each class individually and others combine grades from several sections of the same class. By grading each class individually the sections with students of below average ability are contributing to the number of higher grades. Especially, when students in advanced sections are graded according to their above average ability shown in that area. It is the writer's opinion, that classes should be graded according to the ability of the students, including effort within that class, and not on a general policy set for grading each class.

The percent of A and B grades given by the three subject areas are all beyond the 35 percent recommended in the school's policy for grading. The discussions on page 23 and 24 concerning each individual subject within the required subject area would cover the reasons for the grading as it applies to the required subjects area.

The academic electives area consists of classes in the mathematics area, science area, social studies and English areas that are not needed to fill graduation requirements. Generally, most classes taken above graduation requirements would be selected by the student because he has an interest in that area and may intend to do postgraduate work in that field, or his ability in the area is above that of the average student. In recording information for this study it was evident that students did not take academic elective subjects as often as they did the other elective classes although students in the lower portion of the classes took them as often as students in the upper portion.

The other electives area consisted of all classes not listed in the required or academic electives area. This would include arts and crafts, business education, homemaking, industrial arts and crafts and music.
In these areas teachers tend to grade more highly for several reasons. Within this area are subjects that require special individual skill or ability such as musical talent, the ability to work with the hands as required in the various arts and crafts, typewriting, shorthand, business machines, musical instruments and automechanics. Classes in vocal music have large enrollments, and students in music classes such as vocal, band and orchestra generally receive only A and B grades. In business education students should have a B average to take advanced classes, so students doing advanced work in business education areas would be a select group and should be graded more highly. In arts and crafts the enrollment is limited and students that have exhibited talent in that line are given preference at registration. It is not unusual in some of these areas to find students with exceptional ability in the class, but who do not do very well in the academic areas. Many classes in this area do not require homework so students will elect to take classes in this area to lighten the class work load.

It is this writer's opinion that the teacher's philosophy of grading is not as different as it would appear to be. The difference seems to be in how the classes are expected to be graded, especially, between the required and elective class subjects.

It was hypothesized that the top 25 percent and bottom 25 percent in each class would receive better grades in elective classes than in required classes. A grade point average was computed for each class in the upper and lower 25 percent and t tests were calculated to determine if the differences between the grade point averages in the required subjects and the academic and other elective subjects were significant. In the lower 25 percent, for each class, the difference was significant,
see table 3, between the required and other electives grade point averages.

This finding was previously substantiated by Hill and Klock (1967) who found that students having low averages in academic courses might benefit through the use of the total high school grade average, although the benefit would probably not be of any practical significance.

Several reasons have been given previously in this chapter for teachers giving higher grades in elective classes. One of the factors contributing to this difference is that teachers in the required classes will tend to be more severe in their grading procedures than teachers in the elective classes. Another may be that students have low motivation for achievement in required classes. And, as was stated previously, some academic subjects may be more difficult for the majority of students.

No significant difference was found between the academic electives and the required classes in the lower 25 percent or between the required classes and academic or other elective classes in the upper 25 percent. Since all the grade point averages in the upper 25 percent are above a B there would be little chance for them to be any higher than they already are.

The relationship between the grade point averages for the required classes and the score obtained on the Henmon-Nelson Test was computed and correlations were shown on table 4. The range among the correlations was a low of .42 in the mathematics area to a high of .66 in the physical science area.

Gekoski (1964) says the present point of view is that a .50 correlation between intelligence scores and grades is a substantial correlation.
In the three subject areas the correlations were low, see table 5. The correlations were just the reverse of the grading. High grades gave low correlations and low grades correlated more highly. When the three areas were combined the correlations ranged from .51 to .59. In the Henmon-Nelson Test (Examiner's Manual, 1957) the correlations shown between the composite grade and the test ranged from .60 to .70. The correlations in this study were considerably lower than those in the manual. It must be remembered, however, that the predictive validity data on the test had not been established for the revision of the test, and the correlations given were on grades reported after only a few months had passed from the testing date.

Cronbach (1960) says that a combination of high school grades with a group mental test commonly predicts college marks with a validity of .60 to .70, and that achievement batteries can be substituted for the mental test as a predictor.

The correlations between the American College Test and grade point averages in the required subjects ranged from a low of .50 to a high of .94. These correlations were considerably higher than those found on the Henmon-Nelson Test.

With both tests, the physical science area had the highest correlations and the low were in mathematics. For the combined areas the correlations were from .47 to .59, almost the same as for the Henmon-Nelson Test which had .51 to .59. The correlations on this test ran the same as on the Henmon-Nelson Test. They were opposite to the grading with high grades producing low correlations and lower grades producing higher correlations.

The correlations obtained in this study showed the grading within the required subjects area to be the most statistically significant and
to adhere most closely to established grading policy. Correlations between the average grades and the two tests would rank second. The correlations that were available in the literature ranked the average grade as the best predictor for college success (Jones and Laslett, 1950; Gladfelter, 1936; Segel and Proffit, 1937; Hills and Klock, 1966).

It was concluded from the study that (1) none of the three subject areas at Logan Senior High School graded according to the recommended school policy, (2) there was a significant difference between the grade point averages of the required subjects and the other elective subjects for the lower 25 percent in each graduating class, and (3) the required subjects area correlated more highly with the Hemmon-Nelson Test of Mental Ability and the American College Test.
SUMMARY AND CONCLUSIONS

The magnitude of a problem should determine the amount of emphasis placed upon it. A considerable amount of research has been done on the college level with grades in regards to prediction of college success. It would seem that more investigation needs to be done in grading on the secondary level. This would help improve predictions on the college level and could help to improve the grading done by the teachers within the secondary schools.

The present investigation was done to study the grading within a single high school. Grades were compared to the policy of grading as outlined by the school, and the relationship between the grades and two tests administered by the school were correlated.

Six hundred fifty-five graduates taken from the 1964, 1965 and 1966 graduating classes made up the sample. The grades used were those received during their three years in high school. The tests were the Henmon-Nelson Test of Mental Ability administered in the tenth grade and the American College Test which was taken in the twelfth grade. The Pearson Correlation Coefficient was used to make the correlations.

The hypothesis that the number of A and B grades would fall within the range proposed by Logan Senior High School's grading policy was not substantiated. None of the three subject areas, the required, academic elective or other elective, graded according to the recommended policy.

The second hypothesis proved to be partially true. A t-test showed the differences in the grade point averages, of the lower 25 percent, between the required subjects area and the other electives area to be
significant at the .01 percent level. Differences between the required subjects and the academic electives in the lower 25 percent were not significant and the differences between the grade point averages among the three subject areas in the top 25 percent were not significant.

The third hypothesis established the relationship between the Henmon-Nelson Test of Mental Ability and the grade point averages in the three subject areas. The required subjects area correlated highest with .59, .64, and .47. Correlations in the academic electives and other electives were low, ranging from .37 to .51.

The fourth hypothesis established the relationship between the American College Test and the grade point averages in the three subject areas. Correlations in the required subjects area were highest with .73, .64, and .66. The correlations in the academic and other electives areas were low, ranging from .30 to .46.

The correlations for the combined areas were second highest for both tests and were very similar. The Henmon-Nelson Test correlations were .54, .59, and .51 and for the American College Test .59, .57, and .47.
RECOMMENDATIONS

1. That further study could be made on grading at the high school level by researching the philosophies of teachers in the required and nonrequired subjects.

2. That further study could be made to determine the extent of change, if any, of grading practices over a longer period of time.

3. That similar studies could be made by high school correlating the high school grade point averages of required and nonrequired classes with tests to find the degree of relationship between them.
LITERATURE CITED


VITA

Eda Alene Hansen

Candidate for the Degree of

Master of Science

Thesis: The Relationship Between Grade Point Averages of the Hammon-Nelson Test of Mental Ability and the American College Test

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