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To determine how well certain factors would predict academic achievement, 97 freshmen and 48 sophomores, all full-time 1968-69 students, were tested. The factors were (1) high school GPA, (2) American College Testing (ACT) English test, (3) ACT math portion, (4) ACT social studies portion, (5) ACT natural science portion. The criterion of achievement was freshman and sophomore GPA. Efficiency of the predictor variables was determined by (1) choice of predictor technique (multiple regression equation), (2) obtaining the five prognostic and the one criterion measure for the students, (3) deriving the equation to use on the try-out population, (4) analyzing the difference between the predicted and actual GPA, and (5) determining any relationship between GPA and withdrawals, probations, or dismissals. The equation used to predict the first-semester GPAs, the relative weight of each factor, and the equation efficiency percentages are given. The same equation, used to identify withdrawals, probations, and dismissals succeeded for 16%, 65%, and 42% respectively. It also succeeded in predicting at least 60% of the GPAs for both freshmen and sophomores within plus or minus one standard error. It also identified 66% of the probations and 40% of the dismissals. The conclusion is that these factors, especially high school GPA and ACT English test, predict fairly accurately both academic achievement and dropout potential. Four implications and a suggestion for further study are given. (HH)

THE EFFICIENCY OF THE AMERICAN COLLEGE TESTING PROGRAM AND HIGH SCHOOL GRADES FOR PREDICTING THE ACHIEVEMENT OF CHESAPEAKE COLLEGE STUDENTS

BY

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DEAN OF STUDENTS

CHESAPEAKE COLLEGE

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CHAPTER I

INTRODUCTION

I. THE PROBLEM

Statement of the problem. The primary purpose of this study was to determine the prognosticating efficiency of the American College Testing Program test scores and high school grade point average in the academic achievement of freshmen and sophomores at Chesapeake College. The factors more specifically were: (1) high school grade point average, (2) score on the English portion of the American College Testing Program test, (3) score on the Mathematics portion of the American College Testing Program test, (4) score on the Social Studies portion of the American College Testing Program test, (5) score on the Natural Science portion of the American College Testing Program test. The criterion for academic achievement was freshman and sophomore grade point average. Determining the efficiency of the predictor variables involved: (1) choosing a predictor technique, which was the multiple regression equation; (2) obtaining both the prognostic measures (five selected factors) and criterion measures (grade point average) for the 1967-68 students; (3) deriving from those data a multiple regression equation to be used in predicting the criterion, i.e. grade point average; applying these equations to the freshman and sophomore groups in the 1968-69 class (try-out population), (4) analyzing the difference between the predictions for the 1968-69 class and the first semester grade point average actually attained by these students, and (5) to ascertain if there is a relationship between predicted grade point averages and withdrawals, probations, and academic dismissals.

Importance of the study. A profusion of studies has been conducted employing selected factors which were believed to correlate with academic

achievement in college. Although institutional prediction studies have been numerous, there is a continuing need to develop techniques of prediction which are peculiar to each particular institution.

Since Chesapeake College is a new institution with a growth period ahead, an adequate procedure for identifying students for counseling, placement, and special tutoring is necessary. It is anticipated that the study will also be helpful in identifying potential dropouts.

Delimitations. The delimitations of this study were:

1. The population of the study consisted of 122 students which constituted the 1967-68 student body (full time) at Chesapeake College, ninety-seven which constituted the 1968-69 freshmen class, forty-eight which constituted the 1968-69 sophomore class, and fifty-two which constituted those who withdrew, thirty who were placed on probation and twenty-four who were academically dismissed. The population was limited to students who matriculated for twelve semester hours or more at Chesapeake College and for whom there were sufficient data in their cumulative records.

2. The multiple regression equation developed is applicable only to those students who matriculate at Chesapeake College, Wye Mills, Maryland.

3. No attempt was made to differentiate among particular credit courses taken in college, methods of instruction, and teachers.

4. The high school grade point average was computed from student reported letter grades in English, math, social science, and natural science courses only.

II. ASSUMPTIONS

The assumptions upon which this study was based were:

1. Grade point average is representative of academic achievement, and the numerical values used in the regression equations accurately represent the predictor variables.

2. The students who matriculate at Chesapeake College in the future will possess the same basic characteristics as those comprising the populations employed in the study.

3. The grading practices of the instructors and the evaluative policies of Chesapeake College will not deviate radically in the near future from the methods and procedures practiced at the time of the study.

III. DEFINITIONS OF TERMS

Variable. A variable is a quantity to which an unlimited number of values can be assigned in investigation.[1]

Independent variable. This is a variable to which values may be assigned at pleasure within limits, depending upon the particular problem.[2]

Dependent variable. This is a variable whose value is determined when the values of the independent variables are given.[3]

Regression equation. A regression equation is an equation for estimating a dependent variable from a set of independent variables.[4]

Multiple correlation coefficient. This coefficient shows the degree of relationship existing between three or more variables.[5]

[1]William Granville, Percy Smith, and William Longley, Elements of Differential and Integral Calculus (Boston: Ginn and Company, 1934), p. 7.

[2]Ibid., P. 8.

[3]Ibid.

[4]Murry R. Spiegel, Statistics (New York: Schaum Publishing Co., 1961),p 209.

[5]Ibid.

Standard error of estimate (test). This is an index of the goodness of the forecast of the dependent variable when using a regression equation.[6]

Predictor variables (factors).

1. High school grade point average---X_1
2. Score on English portion of ACT---X_2
3. Score on the math portion of ACT--X_3
4. Score on the social science portion of ACT---X_4
5. Score on the natural science portion of ACT---X_5

Criterion variables. The grade point averages for the entire year (1967-68) and for the first semester (1968-69) were the sole criterion for academic achievement. The algebraic symbol was $\hat{X}_0$.

IV. PROCEDURES

The population and its selection. The main population included three classes. The three classes consisted of the 1967-68 students, 1968-69 freshmen and sophomores at Chesapeake College. The criteria for selection of the persons in the classes were (1) that they matriculated for at least twelve semester hours, (2) that the sophomores had earned at least twenty-four semester hours, (3) that they had sufficient data in their cumulative folders for all of the factors, and that the 1967-68 and 1968-69 classes completed the particular grading period used in ascertaining their academic achievement, i.e. grade point average. The 1967-68 class numbered 122, the 1968-69 freshmen class numbered ninety-seven, and the 1968-69 sophomores numbered forty-eight.

The special groups tested were the 1967-68 second semester and 1968-69 first semester dropouts, probationers, and the academic dismissals. The criterion that they complete the grading period did not apply.

[6]Henry E. Garrett and R. S. Woodworth, Statistics in Psychology and Education (New York: David McKay Company, 1962), p. 161.

Data collection. Five items of information were obtained for each student included in this study. These are shown in Table II. The data were in the students' cumulative folders in the Chesapeake College Admissions' Office. The 1967-68 high school grade point averages and scores for each ACT test were reported by the American College Testing Program in their 1968 Basic Research Service Report on the 1967 Class of Chesapeake College. The 1967-68 college grade point averages were taken from the data contained in the cumulative folders and submitted to the Basic Research Service of the American College Testing Program.

The 1968-69 ACT scores, high school grade point averages, and college grade point averages were secured from records in the cumulative folders of the students. The four point system was used for the grade point averages. The high school grade point averages included English, math, social science, and natural science subjects only. The non-credit or remedial courses were not included in the computation for college grade point averages. To ascertain grade point averages the sum of the quality points is divided by the credit hours attempted.

Treatment of the data. The coefficients or beta weights for each of the predictive factors for the 1967-68 students were computed and reported by the 1968 Basic Research Service of the American College Testing Program for Chesapeake College. A regression equation was developed by utilizing these coefficients plus the pure constant. The multiple correlation (R) procedure is an improvement over the zero order correlation (r) because it shows the combined relationship of several factors with college grade point averages instead of the relationship of one factor at a time with the criterion.

The last phase in the procedure was the calculation of predicted values for the dependent variable using the 1968-69 freshmen and sophomore classes and the deviations between actual and predicted values.

CHAPTER II

DESCRIPTION OF INSTRUMENT EMPLOYED: THE AMERICAN COLLEGE TESTING PROGRAM TEST[1] (ACT)

Student Assessment Devices

Most of the student information provided by ACT to its participating institutions is collected through a national Student Assessment Program. This program uses four tests of educational development and academic potential, a set of self-reported high school grades, and a student information blank.

The tests and grades afford information about the student's potential for academic achievement in various areas. The information blank, or Student Profile Section, furnishes information about his background, special needs, and potential for achievement in non-academic areas. Each of these devices is described briefly below.

The four tests. The major portion of the ACT Battery consists of four tests in English, mathematics, social studies, and natural sciences. These tests were developed to measure as directly as possible the abilities the student will have to apply in his college course work.

In other words, the tests are designed to measure the student's ability to perform the kinds of intellectual tasks typically performed by college students. Most of the test items are concerned with what the student can do with what he has learned; they are not concerned primarily with specific and detailed subject matter.

[1]American College Testing Program, Using ACT On The Campus 68-69 (Iowa City, Iowa: American College Testing Program, 1968)

The English Usage test measures the student's understanding and use of the basic elements in correct and effective writing: punctuation, capitalization, usage, phraseology, style, and organization. It has 80 items and lasts 40 minutes.

The Mathematics Usage test measures the student's mathematical reasoning ability. It has 40 items and lasts 50 minutes. This test emphasizes the solution of practical quantitative problems that are encountered in many college curricula. It also includes a sampling of mathematical techniques covered in high school courses.

The Social Studies Reading test is designed to measure the evaluative reasoning and problem-solving skills required in the social studies. It measures the student's comprehension of reading passages taken from typical social studies materials. It also contains a few items that test his understanding of basic concepts, knowledge of sources of information, and knowledge of special study skills needed in college work in the social studies. It has 52 items and lasts 35 minutes.

The Natural Sciences Reading test measures the critical reasoning and problem-solving skills required in the natural sciences. Emphasis is placed on the formulation and testing of hypotheses and the evaluation of reports of scientific experiments. It has 52 items and lasts 35 minutes.

Four self-reported high school grades. Perhaps the most reliable research finding in education is that high school grades are predictive of college grades; further, that academic aptitude tests and high school grades combined are a better predictor of college grades than either alone. This knowledge led ACT to initiate regular collection of self-reported high school grades.

Scores and norms

The American College Testing Program reports the student's test scores in two

basic forms-standard scores and percentile ranks. This part describes the standard scale system and the various sets of norms developed on its basis. It also includes three general types of norms tables which can be used in the interpretation of the student's test performance.

The Standard Scale System

On each of the four tests in the ACT Battery, the total number of correct responses yields a raw score. ACT uses a scale from 1 (low) to 36 (high) as standard scores converted from raw scores. This scale is the same for each of the four tests.

Rationale of the scale system. The standard score system used with the ACT tests was originally established for use with the first forms of the Iowa Tests of Educational Development (ITED).

The scale was designed to make it as easy as possible for teachers and counselors to interpret test results with proper regard for the errors of measurement inherent in the scores. Accordingly, the probable error of measurement itself was used as the unit of measurement in the scale. The lengths of the various tests in the ITED battery were adjusted to make them uniformly reliable for the population (grades 9, 10, 11, and 12) for which the tests were intended. Under this system, ITED users can be told that the probable error of measurement is approximately one unit for all tests in all high school grades, and that they can follow this simple rule: Chances are approximately 50-50 that the student's true score is within one unit of his obtained score.

The probable error of measurement is somewhat larger for the ACT-tested population and varies from test to test. For the ACT population as well as for other populations, however, the scale automatically prevents test users from attaching significance to raw-score differences.

The following are a few of the important normative characteristics of this scale.

1 is the lowest possible standard score.

36 is the highest possible standard score.

16 is the approximate median (middle) score of unselected national samples of first-semester high school seniors.

20 is the approximate median score of first-semester college bound high school seniors.

Norms for Different Population

One normative group especially relevant to educational programing for college is represented by data in Table I, Percentile Ranks---College-Bound High School Seniors. This table enables the user to see how the prospective student ranks among 1,755,542 college-bound high school students who took the ACT tests between November 1963 and October 1966.

Research Services[2]

The unique and truly remarkable feature of the American College Testing Program is the extensive offering of helpful research services available to colleges using the program. This free service to colleges requires that the total group of students, or any subgroup for which an analysis is requested, shall number at least 200 for whom records can be supplied. The minimum required "record" is an overall GPA for each student. Additional data, generally reported, include GPA's in the curriculum fields of English, mathematics, social studies, and natural sciences. Individual institutions may submit a different set of four additional criteria for each subgroup, if they wish, and beginning in 1963 may obtain analytical results for three local items of predictive information (e.g., scores of

[2]Warren G. Findley, "Tests and Reviews: Achievement Batteries," The Sixth Mental Measurement Yearbook (Highland Park, N.J.: The Gryphon Press,1965) pp. 9-10

TABLE I

PERCENTILE RANKS-
COLLEGE-BOUND HIGH SCHOOL SENIORS

STANDARD SCORE	TEST 1 ENGLISH	TEST 2 MATHE-MATICS	TEST 3 SOCIAL STUDIES	TEST 4 NATURAL SCIENCES	TEST 1-4 COM-POSITE	STANDARD SCORE
36		99.9				36
35		99.7				35
34		99.3		99.9		34
33		98.6	99.9	99.7		33
32		98	99.4	99.0	99.9	32
31	99.9	96	98	98	99.6	31
30	99.8	94	96	96	98.9	30
29	99.3	92	92	93	97	29
28	98	89	88	90	95	28
27	96	86	84	85	92	27
26	93	81	79	79	87	26
25	89	77	74	73	82	25
24	84	72	67	67	76	24
23	78	67	61	61	69	23
22	71	63	55	56	62	22
21	63	58	48	51	55	21
20	55	53	42	45	47	20
19	46	48	36	39	40	19
18	38	42	31	34	33	18
17	31	35	26	29	27	17
16	25	30	22	24	22	16
15	20	24	19	20	17	15
14	16	19	16	16	13	14
13	13	15	13	12	10	13
12	10	11	11	10	7	12
11	8	9	9	7	5	11
10	6	7	7	5	3	10
9	4	6	5	4	2	9
8	3	4	4	2	1	8
7	2	3	3	2		7
6	1	2	2	2		6
5		2	2			5
4		1	1			4
3						3
2						2
1						1
Mean	19.0	19.7	20.6	20.5	20.1	
SD	5.1	6.6	6.3	6.1	5.1	

local tests or interest inventories, data other than grades supplied by high schools).

The illustrative statistical reports and the accompanying manual for interpreting them are models of clarity and completeness. A typical statistical report to the college shows for that institution (a) correlations of each ACT test and the composite score with GPA in the four major fields and the overall GPA, plus the multiple correlation and standard error of estimate for predicting each criterion from all four test scores, (b) corresponding correlations for high school grades in the four major subject areas and overall high school average with the same GPA criteria, and (c) correlations for composites of test scores and high school grades with GPA, subject area by subject area, and overall.

Even more directly useful are expectancy tables showing per cents of students with various predicted GPA's who may be expected to earn GPA's of 1.0 or above, 2.0 or above, 3.0 or above, or 4.0, in each major subject area and overall, when predictions are based on (a) test scores alone and (b) special composites of scores and grades. Corresponding computation tables are offered for use by the local admissions office for evaluating the scores and grades of late applicants not evaluated statistically in the score reporting service.

Additional tables show the college the frequency distributions and local percentile equivalents of (a) the four ACT scores and the composite, (b) predicted GPA in the four subject areas and overall, based on ACT scores only, and (c) predicted GPA for the same five criteria, based on ACT scores and high school grades. Finally, each college receives summary data for all cooperating colleges showing (a) frequency distributions of the various correlations with GPA of individual ACT tests, unweighted ACT composites, optimally weighted ACT scores, optimally weighted composites of high school grades, and weighted composites of ACT scores and high school grades; and (b) percentile equivalents for all men and women

tested in the 1961-62 program for 650 ACT colleges.

The myriad institutional researches in which these data would prove helpful are described and illustrated in the manual. The perennial problem of equivalence of course grades, the effectiveness of sectioning, and comparison with previous classes or other colleges are but a few. It would be difficult to overstate the value in immediate practical usefulness of this research information.

CHAPTER III

PRESENTATION AND ANALYSIS OF DATA

The study was undertaken to test the derived regression equation for actually predicting the grade point averages of Chesapeake College students. The equation utilized the five variables explained in Chapter IV.

I. DESCRIPTIVE DATA RELATIVE TO THE 1967-68 STUDENT POPULATION

The number of cases, the mean, and the standard deviation of each variable were computed. The results are summarized in Table II.

The mean college grade point average ($\hat{X}_0$) for the 1967-68 class was 2.13 and the standard deviation was 1.11. The mean high school grade point average was 2.35 and the standard deviation was 0.69. The mean scores and standard deviations for the English, math, social science, and natural science portions of the American College Testing Program Test were 16.9 and 4.72, 16.1 and 6.60, 18.1 and 6.62, 18.4 and 6.23 respectively. The highest mean ACT score was in natural science (18.4) and the lowest was in math (16.1). The second highest ACT score was in social science (18.14) and next to the lowest score was in English (16.91).

II. CORRELATION MATRICES BASED ON DATA DERIVED FROM THE 1967-68 STUDENT POPULATION

Table III shows the zero order correlation matrices for the six variables. The last column contains the correlations of each of the predictor variables with the criterion $\hat{X}_0$ (1967-68 college grade point averages). The remainder of the matrix gives the product moment correlations among the predictor variables.

A correlation of .16 or more for an N of 122 (Table II) was significant at the .05 level and a correlation of .21 or more was significant at the .01 level.

TABLE II

MEANS AND STANDARD DEVIATIONS FOR EACH VARIABLE
FOR THE 1967-68 STUDENT POPULATION

VARIABLE SYMBOL	NAME	MEAN	N=122	S.D.
$\hat{X}_0$	College grade point average	2.13		1.11
X_1	High school grade point average	2.35		0.69
X_2	English score, ACT	16.91		4.72
X_3	Math score, ACT	16.13		6.60
X_4	Social science score	18.14		6.62
X_5	Natural science score, ACT	18.41		6.23

For the 1967-68 group (Table III) the zero order correlations of all five factors were significant at the .05 level and the factor which had the highest correlation with college grade point average was high school grade point average with a coefficient of .49. The others in order of relationship were the English test (.47), social science (.38), mathematics (.23) and natural science (.21). See Table III.

The multiple correlation coefficient (R) was .59. This means that when the four ACT tests were combined with high school grade point average and a coefficient computed the result was a higher coefficient than with any single factor. For example, the coefficient obtained for high school grade point average and college grade point average was .49. By combining all five variables, the coefficient is increased by .10 to .59. The multiple correlation technique is the basis for the multiple regression equation.

The computed standard error of estimate was .90 rounded to the nearest hundredth. See Tables III and IV. This means that if a student with a predicted college grade point average of 1.70 actually earns 2.00 the prediction is accurate because it falls within the minus one and plus one standard error of estimate. The predictive range would be from .60 to 2.30.

It should be noted that the attainment of an "r" which was significant at a given level did not guarantee causal relationship. Assurance was indicated, however, in these cases that the "r" value was too large to be the result of a sampling accident or from chance alone.

The correlations were used in the formula for computing the beta weights for the predictive equations by the computer. These weights along with the constant (a) made up the predictive equation. The variable weights are actually partial coefficients when viewed individually.

The standard error of estimate was used to provide the range within which the

TABLE III

PRODUCT-MOMENT CORRELATIONS FOR SIX VARIABLES
FOR 1967-68 STUDENT POPULATION

	X_2	X_3	X_4	X_5	$\hat{X}_0$
X_1	.37	.20	.30	.20	.49
X_2		.49	.66	.59	.47
X_3			.53	.65	.23
X_4				.58	.38
X_5					.21
		Multiple Correlation			.59
		Standard Error			.90

X_1 High school grade point average

X_2 English score, ACT

X_3 Math score, ACT

X_4 Social science score, ACT

X_5 Natural science score, ACT

$\hat{X}_0$ College grade point average

predicted grade was expected to fall at a certain level of confidence. For example, if a student's predicted grade point average was 2.50, one could state that the odds were two to one that such a student would actually achieve a grade point average of 2.50 plus or minus one standard error of estimate. (See appendix).

III. THE PREDICTION EQUATION DERIVED USING DATA FROM THE 1967-68 STUDENT POPULATION

A predictive equation was developed by the Basic Research Service of The American College Testing Program by the procedure discussed above. The equation derived from the five predictor variables and the criterion was as follows: $\hat{X}_0 = X_1\ 0.566 + X_2\ 0.074 + X_3\ 0.003 + X_4\ 0.023 + X_5\ 0.024 - 0.475$ (a). The multiple correlation coefficient (R) was .59 and the standard error of estimate was .90 (Table IV).

IV. PREDICTED GRADE POINT AVERAGES (GPA'S) FOR THE 1968-69 STUDENT POPULATION

The equation discussed in the preceding section was used to predict the actual first semester grade point averages (GPA'S) for the 1968-69 freshmen, 1968-69 sophomores and 1967-68, and 1968-69 unsuccessful students.

Each student's actual score values on the four ACT tests and high school grade point average were "plugged in" the equation and the first semester grade point averages computed. In addition the lower and upper limits of prediction were ascertained at the 68 per cent level. In other words, the actual predicted score (GPA) was ascertained, and then minus one and plus one standard error of estimate was determined (see appendix, Tables IX through XIII).

TABLE IV

SCORE VALUES OF FIVE PREDICTOR VARIABLES FOR
CHESAPEAKE COLLEGE GRADE POINT AVERAGE ACCORDING TO CRITERION

	Predictor Variable	Score Value
X_1	High school grade point average	0.566
X_2	English score, ACT	0.074
X_3	Math score, ACT	0.003
X_4	Social science score	0.023
X_5	Natural science score, ACT	0.024
	Plus Constant	0.475
	Multiple Correlation (R)	0.59
	Standard Error of Estimate	0.90

V. EFFICIENCY OF THE GRADE POINT AVERAGE PREDICTIONS FOR THE 1968-69 STUDENT POPULATION

The efficiency of the predictions were ascertained by comparing the grades predicted with the first semester grades actually earned. The appendix contains the predicted grades, deviation of grades, and actual grades for each student in the population. Table V illustrates the efficiency of the predictions by showing the percentage of actual grades which fall within one standard error of the predicted grades as compared with the predicted percentages in each grade category.

For the Freshman group, fifty-nine actual (earned) grade point averages out of a total of ninety-seven lay within plus one and minus one standard error of estimate of the predicted grades. The fifty-nine which lay within plus one and minus one standard error represent 60 per cent of the total group. If this population is typical one is able to predict within plus one and minus one standard error the GPA of three out of five entering Chesapeake College freshmen utilizing the multiple regression equation derived for Chesapeake College.

The same equation showed an efficiency of 75 per cent within the plus one and minus one standard error of estimate level for the Sophomore group. In other words, three out of four grades were within the plus one minus one standard error of estimate of the predicted grades.

A comparison of the efficiency of the equation in predicting actual scores revealed that there were differences in the effectiveness of the equation to predict Freshman scores and Sophomore scores. The efficiency for predicting Freshman GPA's was 60 per cent, while the efficiency for predicting the Sophomore GPA's was 75 per cent (Table V).

Another method of illustrating the efficiency of the grade point average predictions is to compare the percentage of students who were predicted to fall into a certain letter grade category with those who actually fell into the category.

TABLE V

NUMBER AND PERCENTAGE OF ACTUAL GRADES WITHIN

ONE STANDARD ERROR OF ESTIMATE OF PREDICTED GRADES

		NUMBER	PERCENTAGE
Freshmen	(N=97)	59	60
Sophomores	(N=48)	36	75

The comparitive percentages in grade categories between the predicted grades and actual grades is presented in Table VI.

For the Freshman group, 3.5 per cent of the students were predicted to make A's; 5 per cent actually earned A's. In this same group 13 per cent were predicted to earn B's; 31 per cent actually did so. Sixty-one per cent C's were predicted; 52 per cent were earned. Twenty-one per cent D's and F's were predicted; 12 per cent were earned.

In the Sophomore group 4 per cent A's were predicted and 19 per cent A's were earned. The remainder of the comparisons are as follows:

B's --- 29 per cent predicted, 25 per cent earned

C's --- 64 per cent predicted, 42 per cent earned

D's and F's --- 14 per cent predicted, none earned

It should be noted that these percentages include any student who might fall in the particular grade category irrespective of his individual predicted grade. For example, many students who fell in the "C" category might have been predicted to make "B's". The success of the equations in categorical predictions, however, is an indication of the efficiency of the equation to predict the grade categories of all the students.

From the foregoing it appears that grades can be predicted with accuracy within designated limits. The equation has greater efficiency when applied to Sophomores than Freshmen.

VI. THE EFFICIENCY OF THE EQUATION IN IDENTIFYING DROP-OUTS, WITHDRAWALS AND ACADEMIC DISMISSALS

The Withdrawal group included those who did not complete a semester, either in the spring semester, 1968, or the fall semester, 1968. Table XI in the appendix gives the predicted GPA for all of the students who withdrew during those two semesters.

TABLE VI

PERCENTAGE OF PREDICTED AND EARNED GRADES
IN EACH GRADE CATEGORY FOR THE 1968-69 STUDENTS

Grade		Freshmen (N=97) Predicted	Freshmen (N=97) Earned	Sophomores (N=48) Predicted	Sophomores (N=48) Earned
Below 1.5	D or F	21	12	2	14
1.6 - 2.5	C	61	52	64	42
2.6 - 3.5	B	13	31	29	25
Above 3.5	A	2	5	4	19

Table VII illustrates the number and percentage of those who withdrew who were predicted to earn a GPA of 1.50 or lower. This 1.50 GPA was used as a criterion because anyone who earned this average would be in academic difficulty by the end of the first semester.

From Table VII it can be seen that out of fifty-two withdrawals that only eight, or 16 per cent, were predicted to earn a GPA of 1.50 or lower. It must be concluded that potential withdrawals cannot be identified by use of the predictive equation. It would seem that students withdraw for many reasons other than academic.

The prediction technique was successful in predicting a 1.50 or lower GPA for ten of the twenty-four actually dismissed for academic cause. The ten out of twenty-four equals 42 per cent. This leads to the conclusion that there is a possibility of identifying four out of ten potential victims of academic dismissal.

VII. EFFICIENCY IN IDENTIFYING THOSE WHO WILL BE PLACED ON ACADEMIC PROBATION

This population included students who were placed on probation for falling below a certain cumulative GPA. The point at which a student is placed on probation ranges from 1.50 for students who have attempted from twelve to eighteen semester hours to 2.00 for those who have attempted forty-eight to sixty-four semester hours. Any student is considered a likely prospect for probation if his GPA falls below 2.00.

The probation status is important because many of the students on academic probation either fail to re-register or become victims of academic dismissal.

Table VIII reveals that nineteen out of the total number of thirty who were placed on probation were predicted to earn a GPA of below 2.00. These nineteen successful predictions equal 65 per cent. This means that almost two out of three of those who are academically dismissed can be identified at matriculation.

TABLE VII

NUMBER AND PERCENTAGE OF SPRING AND FALL SEMESTER, 1968 STUDENTS WHO WITHDREW OR WERE ACADEMICALLY DISMISSED, WHO WERE PREDICTED TO EARN A GRADE POINT AVERAGE OF 1.50 OR LOWER

	NUMBER	PERCENTAGE
Withdrew (N=52)	8	16
Academically Dismissed (N=24)	10	42

TABLE VIII

NUMBER AND PERCENTAGE OF SPRING AND FALL SEMESTER 1968 STUDENTS WHO WERE PLACED ON PROBATION WHO WERE PREDICTED TO EARN A GRADE POINT AVERAGE OF BELOW 2.0 (N=30)

NUMBER	PERCENTAGE
19	65

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

I. SUMMARY

The primary purpose of this study was to ascertain the predictive effciency of the four American College Testing Program tests (ACT) and high school grade point average in the academic achievement of freshmen and sophomores at Chesapeake College, Wye Mills, Maryland. The factors then were: (1) high school grade point average---X_1, (2) ACT English Test---X_2, (3) ACT Mathematics Test---X_3, (4) ACT Social Studies Test, and (5) ACT Natural Science Test. The criterion for academic achievement was 1967-68 college grade point averages. Determination of the efficiency (value) of the predictor variables involved: (1) choosing the prediction instrument which was the multiple regression equation prepared by the ACT Research Services for Chesapeake College based on the 1967-68 academic year student population, published in the 1968 Basic Research Report, (2) applying these equations to the 1968-69 Freshman and Sophomore groups (experimental groups); and (3) analyzing the difference between the predictions for the 1968-69 class and the first semester grade point average actually attained by these students.

Another purpose was to attempt to identify before hand students who would withdraw, be placed on probation or be academically dismissed. The same procedure described above was utilized to predict and analyze.

The populations used for the grade predictions and comparisons were all 1968-69 full time freshmen and sophomores for whom all data relative to the study were available. These groups numbered ninety-seven and forty-eight respectively.

The potential and actual drop-out groups included those who withdrew, were placed on academic probation, or were academically dismissed. These included the

fifty-two withdrawals during the spring and fall semesters of 1968, the twenty-four academic dismissals, and the thirty who were placed on probation during the same period.

The major findings of the present study are presented below.

1. The equation which was utilized in predicting 1968-69 first semester grade point averages, relative weights of each factor, and equation efficiency percentages are as follows:

$$\hat{X}_0 = X_1\ 0.566 + X_2\ 0.074 + X_3\ 0.003 + X_4\ 0.023 + X_5\ 0.024 - 0.475 \text{ (a) (60 and 75 per cent)}$$

2. The same equation was utilized in identifying students who would withdraw, be placed on probation, be academically dismissed. It was successful to the extent of 16 per cent, 65 per cent and 42 per cent respectively.

3. The equation proved effective in predicting at least three out of five GPA's within minus one and plus one standard error for the freshmen and three out of five GPA's within minus one and plus one standard error for the sophomores.

4. The equation was successful in identifying two out of three students who were placed on probation and four out of ten who were academically dismissed.

II. CONCLUSIONS

Based on the above findings one can conclude that it is possible to predict with reasonable accuracy the grades of college freshmen and sophomores at Chesapeake College using high school grade point averages and the four ACT Program tests. The same factors can be utilized to identify potential drop outs, especially those who will be placed on probation unless steps are taken to overcome the obstacles to academic success.

High school grade point average contributed the most to the multiple correlation coefficient and subsequently to predictive efficiency. The second greatest contributor to predictive efficiency was the ACT English Test. The ACT Math Test added little to the multiple correlation. In fact, if one were to omit the Math Test from the equation it would change the predictions very slightly since it has such a little weight factor. The weights of the Natural Science and Social Science Tests tend to cancel each other out; therefore, high school grade point average and a good English test would be almost as efficient predictors as all four ACT Tests combined, in relationship to <u>general</u> college success at Chesapeake College.

III. IMPLICATIONS

On the basis of the study it would seem that the following implications are justified.

1. More significance should be given to the high school grades of applicants to the College. The study reaffirmed the conclusion, often found, that good grades in high school were the best single indicator of good grades in college.

2. For placement and selection purposes the use of the ACT English Test seemed to be amply justified as the scores on this test were good predictors of college grade point average. However, since the ACT Math Test is such a poor predictor it might be advisable to consider some alternatives in the testing program.

3. The majority of withdrawals are for reasons other than academic. It is impossible to identify by predictive techniques those who will withdraw; therefore, College personnel should examine factors such as finance, morale, boredom, adjustment, cocurricular activities, etc.

4. Many potential casualties of probation and academic dismissal can be identified through predictive techniques. Those who are predicted to have difficulty should be counseled and possibly placed on a tutorial program.

5. Since the present study did not differentiate between curriculum or subjects taken, a study predicting grades for particular subjects might be of value.

APPENDIX

GRADE PREDICTIONS

TABLE IX

PREDICTED GRADE POINT AVERAGES, GRADE POINTS AT THE MINUS ONE, PLUS ONE LEVELS AND EARNED GRADE POINT AVERAGES FOR 1968-69 FRESHMAN GROUP

STUDENT NO.	STD. ER. -1	PREDICTED GPA	STD. ER. +1	EARNED GPA
1	1.30	2.20	3.10	3.43
2	1.30	2.20	3.10	1.77
3	.30	1.20	2.10	1.90
4	1.00	1.90	2.80	1.79
5	1.90	2.80	3.70	3.71
6	.20	1.10	2.00	2.80
7	1.60	2.50	3.40	3.18
8	1.00	1.90	2.80	2.20
9	1.20	2.10	3.00	1.94
10	1.10	2.00	2.90	2.80
11	1.20	2.10	3.00	2.15
12	1.10	2.00	2.90	1.88
13	1.40	2.30	3.20	4.00
14	1.30	2.20	3.10	2.00
15	2.70	3.60	4.50	4.00
16	.60	1.50	2.40	2.00
17	.70	2.60	3.50	3.00
18	.70	1.60	2.50	2.17
19	1.40	2.30	3.20	2.54
20	.90	1.80	2.70	.64
21	1.40	2.30	3.20	1.53
22	1.20	2.10	3.00	2.30
23	.80	1.70	2.60	3.21
24	1.10	2.00	2.90	3.14
25	1.60	2.50	3.40	2.36
26	1.10	2.00	2.90	2.10
27	.40	1.30	2.20	2.63
28	.70	1.60	2.50	2.25
29	1.30	2.20	3.10	2.31
30	.60	1.50	2.40	2.73
31	.80	1.70	2.60	2.08
32	.60	1.50	2.40	.36
33	.50	1.40	2.30	2.50
34	.80	1.70	2.60	3.19
35	1.60	2.50	3.40	3.63
36	1.60	2.50	3.40	.85
37	.70	1.60	2.50	0.00
38	1.50	2.40	3.30	1.91
39	1.30	2.20	3.10	2.92
40	1.50	2.40	3.30	2.63
41	2.40	3.30	4.20	2.44
42	.40	1.30	2.20	2.13
43	1.40	2.30	3.20	2.55
44	1.40	2.30	3.20	2.29
45	.10	1.00	1.90	1.43

TABLE IX (continued)

STUDENT NO.	STD. ER. -1	PREDICTED GPA	STD. ER. +1	EARNED GPA
46	.90	1.80	2.70	1.83
47	1.30	2.20	3.10	3.25
48	.70	1.60	2.50	3.00
49	1.80	2.70	3.60	2.69
50	1.30	2.20	3.10	2.55
51	2.10	3.00	3.90	2.75
52	2.60	3.50	4.40	2.75
53	.70	1.60	2.50	2.36
54	.70	1.60	2.50	1.88
55	.20	1.10	2.00	3.33
56	.20	.70	1.60	.63
57	.60	1.50	2.40	2.00
58	.20	1.10	2.00	2.00
59	.60	1.50	2.40	3.00
60	1.20	2.10	3.00	2.44
61	.60	1.50	2.40	2.50
62	.50	1.40	2.30	1.33
63	1.40	2.30	3.20	3.07
64	2.30	3.20	4.10	3.08
65	1.90	2.80	3.70	2.50
66	.60	1.50	2.40	2.50
67	1.70	2.60	3.50	2.55
68	1.00	1.90	2.80	1.38
69	2.10	3.00	3.90	3.59
70	1.20	2.10	3.00	2.00
71	1.00	1.90	2.80	1.67
72	1.60	2.50	3.40	1.60
73	.40	1.30	2.20	1.43
74	.20	.70	1.60	4.00
75	.70	1.60	2.50	3.27
76	.80	1.70	2.60	1.00
77	1.80	2.70	3.60	3.14
78	1.20	2.10	3.00	2.29
79	1.30	2.20	3.10	2.56
80	.70	1.60	2.50	3.33
81	1.10	2.00	2.90	2.91
82	2.10	3.00	3.90	3.19
83	2.10	3.00	3.90	3.00
84	.85	1.75	2.65	2.44
85	1.10	2.00	2.90	2.29
86	.70	1.60	2.50	1.88
87	1.00	1.90	2.80	.73
88	.75	1.65	2.55	2.69
89	.25	1.15	2.05	2.00
90	1.00	1.90	2.80	2.73
91	1.30	2.20	3.10	3.00
92	1.80	2.70	3.60	1.82
93	1.40	2.30	3.20	2.00
94	1.00	1.90	2.80	2.27
95	.50	1.40	2.30	2.90
96	1.00	1.90	2.80	1.91
97	1.00	1.90	2.80	3.57

TABLE X

1968-69 SOPHOMORES

STUDENT NO.	STD. ER. -1	PREDICTED GPA	STD. ER. +1	EARNED GPA
1	1.30	2.20	3.10	2.00
2	1.30	2.20	3.10	1.77
3	1.70	2.60	3.50	2.57
4	1.50	2.40	3.30	2.57
5	2.30	3.20	4.10	2.94
6	1.50	2.40	3.30	2.85
7	1.40	2.30	3.20	2.24
8	2.20	3.10	4.00	2.76
9	1.70	2.60	3.50	2.53
10	1.50	2.40	3.30	1.79
11	1.10	2.00	2.90	2.08
12	1.40	2.30	3.20	2.15
13	2.90	3.80	4.70	3.94
14	2.80	3.70	4.60	3.69
15	1.30	2.20	3.10	2.57
16	2.00	2.90	3.80	3.33
17	1.40	2.30	3.20	1.38
18	2.30	3.20	4.10	2.33
19	1.20	2.10	3.00	2.71
20	.90	1.80	2.70	2.00
21	1.00	1.90	2.80	1.54
22	1.80	2.70	3.60	3.76
23	.90	1.80	2.70	2.56
24	1.60	2.50	3.40	3.60
25	1.20	2.10	3.00	2.26
26	1.10	2.00	2.90	1.00
27	1.50	2.40	3.30	1.50
28	1.00	1.90	2.80	1.53
29	2.50	3.40	4.30	3.53
30	1.30	2.20	3.10	2.63
31	.80	1.70	2.60	1.56
32	1.80	2.70	3.60	3.75
33	1.30	2.20	3.10	2.63
34	1.10	2.00	2.90	2.00
35	1.50	2.40	3.30	3.00
36	1.10	2.00	2.90	2.28
37	2.50	3.40	4.30	1.44
38	2.30	3.20	4.10	1.83
39	2.60	3.50	4.40	3.38
40	.50	1.40	2.30	2.36
41	.70	1.60	2.50	2.53
42	1.50	2.30	3.20	3.81
43	1.50	2.40	3.30	3.00
44	1.10	2.00	2.90	1.53
45	2.10	3.00	3.90	1.54
46	1.50	2.40	3.30	3.17
47	1.90	2.80	3.70	1.92
48	1.60	2.50	3.40	3.79

TABLE XI

WITHDRAWALS, SPRING 1968, FALL 1968

STUDENT NO.	STD. ER. -1	PREDICTED GPA	STD. ER. +1
1	.50	1.40	2.30
2	1.50	2.40	3.30
3	1.20	2.10	2.00
4	.60	1.50	2.40
5	2.30	3.20	4.10
6	.60	1.50	2.40
7	1.00	1.90	2.80
8	.20	1.10	2.00
9	.70	1.60	2.50
10	.80	1.70	2.60
11	1.30	2.20	3.10
12	1.90	2.80	3.70
13	2.10	3.00	3.90
14	.10	1.00	1.90
15	.80	1.70	2.60
16	2.10	2.00	2.90
17	.20	1.10	2.00
18	1.80	2.70	3.60
19	1.60	2.50	3.40
20	.70	1.60	2.50
21	.60	1.50	2.40
22	1.40	2.30	3.20
23	2.00	2.90	3.80
24	1.90	2.80	3.70
25	.70	1.60	2.50
26	.70	1.60	2.50
27	1.80	2.70	3.60
28	2.90	3.80	4.70
29	1.30	2.20	3.10
30	1.40	2.30	3.20
31	-.30	.60	1.50
32	1.10	2.00	2.90
33	2.00	2.90	3.80
34	1.70	2.60	3.50
35	2.50	3.40	4.30
36	2.40	3.30	4.20
37	1.30	2.20	3.10
38	1.40	2.30	3.20
39	.40	1.30	2.20
40	2.40	3.30	4.20
41	1.20	2.10	3.00
42	2.30	3.20	4.10
43	1.40	2.30	3.20
44	2.00	2.90	3.80
45	1.60	2.50	3.40

TABLE XI

WITHDRAWALS, SPRING 1968, FALL 1968

STUDENT NO.	STD. ER -1	PREDICTED GPA	STD. ER. +1
46	.80	1.70	2.60
47	1.80	2.70	3.60
48	1.50	2.40	3.30
49	1.30	2.20	3.10
50	1.20	2.10	3.00
51	2.30	3.20	4.10
52	2.30	3.20	4.10

TABLE XII

PROBATIONARY STUDENTS,
SPRING 1968, FALL 1968

STUDENT NO.	PREDICTED GPA	EARNED GPA
1	1.80	0.86
2	1.90	1.59
3	1.70	1.63
4	2.00	1.53
5	2.30	1.78
6	2.50	0.85
7	1.90	1.73
8	1.70	1.86
9	2.00	1.43
10	1.60	1.46
11	1.80	1.64
12	3.00	1.83
13	2.80	1.79
14	1.90	0.93
15	1.50	1.07
16	2.50	1.89
17	1.80	0.64
18	2.50	0.85
19	0.70	0.63
20	1.40	1.33
21	1.90	1.38
22	1.30	1.43
23	1.70	1.00
24	1.90	0.73
25	2.30	1.30
26	1.90	1.54
27	2.40	1.50
28	1.90	1.53
29	1.70	1.56
30	3.40	1.44

TABLE XIII

ACADEMICALLY DISMISSED STUDENTS,
SPRING SEMESTER 1968 AND FALL SEMESTER 1968

STUDENT NO.	STD. ER. -1	PREDICTED GPA	STD. ER. +1
1	1.50	2.40	3.30
2	1.60	1.60	2.50
3	0.00	0.90	1.80
4	1.80	2.70	3.60
5	0.20	1.10	2.00
6	1.70	2.70	3.60
7	0.60	1.51	2.40
8	-0.30	0.60	1.50
9	-0.19	0.71	1.61
10	-0.63	0.27	1.17
11	1.50	2.40	3.30
12	0.90	1.80	2.70
13	0.50	1.40	2.30
14	0.80	1.70	2.60
15	0.50	1.40	2.30
16	1.30	2.20	3.10
17	0.80	1.70	2.60
18	1.20	2.10	3.00
19	1.60	2.50	3.40
20	0.50	1.40	2.30
21	0.06	.96	1.86
22	-0.76	.14	1.04
23	1.80	1.70	2.60
24	1.00	1.90	2.80