

**THE VALIDITY OF ACT SCORES AND
HIGH SCHOOL GRADE POINT AVERAGE AT
SPRINGFIELD HIGH SCHOOL IN PREDICTING
COLLEGE FRESHMAN GRADES AT APSU**

BY

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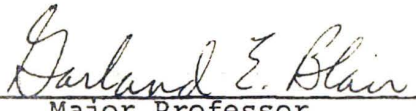
A Research Paper
Presented to
the Graduate Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in Counseling and Guidance

by
June Hayes Neely
August 1973

To the Graduate Council:

I am submitting herewith a Research Paper written by June Hayes Neely entitled "The Validity of ACT Scores and High School Grade Point Average at Springfield High School in Predicting College Freshman Grades at Austin Peay State University." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Counseling and Guidance.


Major Professor

Accepted for the Council:

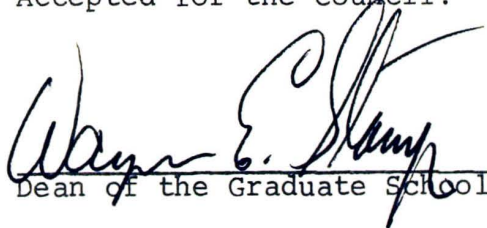

Dean of the Graduate School

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CHAPTER I

INTRODUCTION

The emphasis on the importance of education beyond high school has been increasing in the past few years (Dyer, 1963). Although the final decision about college should be made by the student, the counselor has a great responsibility to see that the student has as much helpful information available as possible (Traxler, 1953).

Secondary school curriculum is undergoing a series of major and minor revolutions in nearly all fields. There should be a link provided between academic work in the high school and the academic work of the colleges in order to make the curriculum changes more meaningful. High school teachers need to realize what kinds of academic behavior the colleges are looking for in their entering students.

Cashen (1967) feels that academic success is a basic consideration of entering freshmen, and he also feels research is necessary in many different areas relative to the prediction of future achievement.

Research in individual schools needs to be emphasized in order that accurate information about the future academic achievement of that school's students be available. The only way a school can get accurate information is by completing its own statistical study.

Although there has been a great deal of research in regard to prediction of college achievement, most of it has been based on the achievement of students from many schools who attended one college or students from many schools who attended many colleges. There have been fewer studies based on data available from one high school in predicting success in one college.

Statement of the Problem

The purpose of this study is to test the usefulness of two variables available in the high school record for predicting academic performance of Springfield High School students at Austin Peay State University. The two variables are high school grade point average and American College Test Composite scores. Since no two variables do an equally good job of predicting college success, the validity of each variable is determined to establish which one is the best predictor of college grades. The Pearson Product-Moment Coefficient of Correlation is used. A multiple correlation is also done to see if the two variables combined are better at predicting academic success than either one separately. Another purpose of this study is to develop a means for using this information gathered in counseling Springfield High School students in the future.

Significance of the Study

Since the high school counselor has the major responsibility in counseling students for college, they need as

much objective information as possible in predicting college success. In the past the main source of information has been the cumulative records. In Robertson County, of the high school graduates who enroll in college, approximately 10% attend Austin Peay State University. By developing this study, these students will be able to base their decisions about college not only on intangible factors but also on objective information. It is believed that not only Springfield High School students but all of Robertson County students will be able to benefit from this study.

Limitations of the Study

Munday (1970) has shown that in doing this study for only one college such conditions as (a) institutional characteristics and (b) evaluation procedures are restricted. However, conditions such as student attitude, culture, health, range of talent, and ability level of the freshman student body are related to the magnitude of the predictive correlations.

There are also variables such as unusually high motivation, personality, and interest that have to be taken into consideration.

Single correlations are computed on each variable, and then a multiple correlation of a combination of the variables is done. Correlations are also done with one variable partialled out at a time.

Although the number of students in the study is small, the sample covers an eight year span. Freshman grade point average is used in all cases.

CHAPTER II

REVIEW OF RELATED LITERATURE

Morgenfeld (1967) developed a means of improving upon the use of high school grade averages as predictors of grades at Alfred State College. He found that compensating for institutional differences in high school grading standards improved the coefficient of correlation between high school grades and college grades.

Perlberg (1968) carried out a longitudinal study investigating academic predictors and problems related to prediction at Technion-Israel Institute of Technology. Intellectual predictors and academic criteria alone were investigated. High school and matriculation certificate grades and Technion Institute's predictors (entrance examination grades and the matriculation certificate combined) were considered. Technion's entrance examination was the best single predictor for the first two years.

Jex (1966) found that the high school average was the best single indicator of probable success and that adding a third predictor to high school average and achievement test scores added little predictive value. He also found that women were more predictable and generally received better grades, that these studies were valid for later use in admissions and counseling, and that the optimum combination

of high school average and achievement test scores currently represented practical limits to prediction of college success.

Williams (1963) found a low correlation between first semester college grades and scores on measures of scholastic aptitude, reading, mechanics of English, and motivation. However, interviews of eleven selected students revealed the relationship of college success to peer group and family group expectations.

Layman (1967) found that high school average and entrance examination measures were significant predictors of freshman grade point average. But high school grade point average was the best single predictor of freshman grade point average. However, Willingham (1963) found that admission measures made little or no contribution to freshman grades.

Passons (1965) and Hoyt (1968) made a study to determine the predictive validity of the American College Test and high school grades as predictors of college grade point average. High school grade point average yielded the highest predictive validity for first semester grade point average. Hoyt also showed examples of how an individual student's grades can be predicted at a specific institution.

Hooper (1968) did a study to predict college success using grade point average and other variables, both cognitive and non-cognitive. He found the single best predictor of success in college English and mathematics was high school success in these subjects. However, the best predictor for biology was the over-all high school grade point average.

In summary, he generally supported the efficacy of considering past grades to predict grade success at the next level.

Hendrix (1968) reported an attempt to determine the nature and extent of relationships between total grade point average and grades in selected courses with ACT scores and the student's status as high school graduates. In general it was found that the predictors for individual courses were more accurate than predictors for grade point averages. A correlation of about .60 appeared to be the highest than can be expected when grades and grade point averages were the criteria. Conclusions include warnings that there was no philosophical reason to expect or desire a high degree of predictability of grades and grade point averages from ability measures. Low correlation coefficients on these measures indicated that college was providing appropriate programs. A low multiple correlation could also mean that there was not a linear relationship between the criterion, grade point average, and the predictors.

Perkins (1968) found that the mature students higher grade point average appeared to be due to their superior maturity and motivation. However, the sample was too small for broad generalizations.

Mann (1961), Lewis (1964), McCormick and Asher (1964) and Foster and Danskin (1965) found that either high school rank or high school grade point average was the best single predictor of college grade point average.

Scannell (1960) also found that high school grade point average was the best single predictor of college success, but class rank in small high schools was not highly predictive. He also found that elementary school test data correlated highly with college success.

Ludenia (1970) made a study of marginal students to determine whether (1) the ACT composite score, (2) high school class rank, or (3) a combination of these were good predictors of academic success in college. The marginal student was defined as one not meeting standard college admission requirements, but one whose ACT scores indicated some reasonable prospect of success. A higher correlation was obtained by combining ACT and HSPR than for either used separately. However, the increase in predictability was not substantial.

Pemberton (1970) has written a paper concerning the relevance and objectivity of grades and grade point averages as measures and as predictors of success. He concluded as measures they are ambiguous, reflecting differences in sex, basic temperament, instructors, departments, institutions, as much as levels of competence. As predictors of "success", grade point averages have not been particularly valid for either graduate school or occupation.

Cherdack (1971) conducted a study to determine the degree to which SAT scores and high school grades were effective in predicting freshman grades of disadvantaged-minority students. The results showed that the high school average was the best overall predictor of college grades for both minority and white freshmen.

Gell (1971) analyzed the relationship between high school grades, American College Test Scores, and first semester college grades. He found that: (1) academic success was predicted more accurately for career students than for transfer students, with grades the best predictor; (2) ACT scores were more efficient in predicting the college grades of transfer students; and (3) grades and ACT scores were useful in counseling students, but should not be used as the only criteria.

Cattell (1961) and others correlated tests of interests and personality with school achievement for 154 urban and 124 rural children. The multiple correlation between Ability Measures and Achievement was .68, between personality and achievement was .55. The combined multiple correlation between abilities, personality, and interest test scores was .72. The implication of these findings was that in predicting achievement, personality, and interest tests add significantly to the multiple correlation found between ability and achievement.

CHAPTER III

DESIGN OF THE STUDY

The main purpose of the study was to find a means for predicting academic success of Springfield High School graduates who attend Austin Peay State University.

The criterion used in this study was defined in terms of the overall freshman grade point average at Austin Peay State University. The degree of success of each student was recorded on a point basis (A=4, B=3, C=2, D=1, F=0). Grade point averages were obtained from the Admissions Office at Austin Peay State University.

The Springfield High School cumulative record of each student provided the prediction variables of high school grade point average and American College Test Composite Score. The high school grade point average was also computed on a four point system. On the ACT, students were tested in English, Mathematics, Social Studies, and Natural Sciences. The results were reported in standard scores of 1 to 36. The composite score was an average of all of the areas tested.

Caution should be taken against exclusive reliance on these scores when counseling students because other factors such as students' goals, interests, values, motivation, and the college's educational and training requirements must be considered.

High school grades and ACT composite scores were selected because they were used most often by the high school counselor to assess ability to do college work and because they were readily available in the high school records.

The Pearson Product-Moment Coefficient of Correlation was used to determine the relationship of the two variables to college grades. Therefore, the high school grade point average and ACT scores were individually correlated with their freshman grade point average. An expectancy table (Table I) was also prepared from the data collected (Table II). It was felt that this expectancy table could be used in the future in counseling students at Springfield High School who attend Austin Peay State University.

TABLE I
EXPECTANCY TABLE

CGPA		0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5
HSGPA	ACT	0.4	0.9	1.4	1.9	2.4	2.9	3.4	3.9
3.9-3.5	1st quartile								
	2nd "								
	3rd "								x
	4th "								
3.0-3.4	1st "								
	2nd "						x	x	
	3rd "					x	xx	x	
	4th "								
2.5-2.9	1st "						x		
	2nd "						x		
	3rd "					xxx			
	4th "								
2.0-2.4	1st "					x			
	2nd "		x		x	xxx			
	3rd "				xxx	x	x		
	4th "								
1.5-1.9	1st "								
	2nd "				x				
	3rd "				xx				
	4th "								
1.0-1.4	1st "								
	2nd "			x		x			
	3rd "	x		x	x				
	4th "								
.05-.09	1st "								
	2nd "								
	3rd "								
	4th "								
.00-.04	1st "								
	2nd "								
	3rd "								
	4th "								

TABLE II

Data for Correlations, Austin Peay State University Students

HSGPA	ACT	CPGA
3.964	23	3.563
3.484	17	2.000
3.379	17	2.667
3.355	20	2.618
3.321	22	3.387
3.290	15	2.515
3.138	16	3.171
2.786	13	2.067
2.744	28	2.848
2.724	19	2.531
2.517	18	2.194
2.516	15	2.294
2.483	28	2.138
2.400	22	0.871
2.357	22	2.412
2.276	17	1.935
2.250	17	1.571
2.250	16	1.941
2.207	22	1.607
2.107	20	2.167
2.103	20	2.129
2.000	15	2.357
2.000	16	2.655
1.821	16	1.564
1.724	20	1.697
1.714	15	0.500
1.483	22	2.158
1.414	14	1.500
1.344	24	1.000
1.323	17	1.321
1.065	11	0.000

CHAPTER IV

ANALYSIS OF DATA

Data were collected from the Springfield High School cumulative records of the 31 students who graduated from 1964 to 1972 and who also attended Austin Peay State University.

The Pearson Product-Moment Coefficient of Correlation was used to test the validity of the independent variables to predict college academic achievement. High school grade point average was the best single predictor of college academic achievement. This finding was in agreement with the findings of most of the related studies reviewed.

In order to be able to make practical application of the collected data in counseling high school students and their parents, an expectancy table (Table I) was prepared for each variable in predicting college achievement at Austin Peay State University.

The high school grade point average mean for students attending Austin Peay State University was 2.3772, and the standard deviation was .7136. College GPA mean for this group was 2.0444 and the standard deviation was .7780. The correlation between college grade point average and high school grade point average was .747 which was significant at the .01 level. The ACT composite mean was 18.6 and the standard deviation was 4.048. The validity of the ACT composite score in predicting college grade point average at

Austin Peay with correlations of .3064 was not significant at the .01 level. The correlation between the high school grade point average and the ACT was also found not to be significant at the .01 level. The correlation was .1975. The multiple correlation between the two variables was .7507 which was also significant at the .01 level.

Upon analysis of the data it was found that high school grade point average was the best single predictor of college grade point average in the freshman year. There was not a significant correlation between ACT scores and college grade point average. However, the correlation between the two variables combined was higher than either one separately.

Data from the expectancy table would indicate that a student's chances for academic success in college increases as his high school grade point average increases.

CHAPTER V

SUMMARY AND CONCLUSIONS

The primary purpose of this study was to find a means for predicting academic achievement of Springfield High School students who attended Austin Peay State University. Thirty-one students who graduated from 1964 to 1972 were included in this study.

The prediction variables of high school grade point average and ACT composite scores were obtained from the Springfield High School cumulative record of each student. The criterion was the freshman grade point average which was obtained from Austin Peay State University. The Pearson-Product-Moment Coefficient of Correlation was computed to determine the relationship of the two variables to freshman GPA. After correlating the data, an expectancy table (Table I) was prepared.

Need for Further Research

1. Additional research is needed on the predictive validity of variables such as personality, interest, and motivation.

2. Variables such as differences in grading system and effectiveness of freshman advisory service needs to be investigated.

3. Other variables such as study habits, attitudes, and self-concept should be studied for their predictive ability.

4. Additional research is needed in the prediction of college grade point average, ACT scores, or other variables available in the high school cumulative record.

5. Additional research is needed as to the ability of high school grade point average or other variables available in the high school record to predict completion of a college program for a degree.

6. Research is needed as to the ability of high school grade point average in a particular subject to predict performance in that subject in college as compared with the predictive ability of the ACT score in the subject.

Implications of the Study

Studies such as this one can be valuable because high school counselors need information that would be useful in predicting college achievement from variables readily available in the high school cumulative record. The counselor ordinarily has more than one kind of information available, and he must take into account more than a single fact before making a judgment. In a school system, two students presenting similar test scores and high school grades may have quite different advice offered to them. If reliable judgments are to be made, a more uniform method of handling the available facts is highly desirable. The counselor needs to be able to make clear to the student the basis for his predictions--the

rationale underlying the advice. One statistically sophisticated technique is the multiple regression of combining data. Another device that presents the facts which form the basis for prediction and also makes the facts easy to communicate is the expectancy table (Table I).

We can never reduce the mistakes in college admissions to zero. Good students get admitted and usually make the grades predicted for them, but other students may have been rejected who would have done just as well, if not better. The information found from studies such as this may well serve to motivate both kinds of students and at the same time report to the admissions officer the odds for or against success of any one candidate. Although correlations and expectancy tables contribute to wisdom in guidance and selection procedures, there is always that small margin of error that allows the maladjusted genius to reach his place at the top in spite of all the available information.

Information pertaining to prediction of college success is particularly needed in the smaller schools. Guidance counselors should be encouraged to conduct studies in their respective schools.

REFERENCES

- Cashen, Michael. Student, parent, and counselor prediction. Journal of Education Research, 1967, 60(5), 212-214.
- Cattell, Raymond B., John Butcher, David Conner, A. P. Sealy, Bien Tsujioka. Prediction and understanding of the effect of children's interest upon school performance. Co-operative Research Project Number 701 (8383) Washington, D.C.: United States Offices, Health, Education, and Welfare, 1961.
- Cherdack, Arthur N. The predictive validity of the scholastic aptitude test for the disadvantaged college students enrolled in a special education program. (Bureau of Research Rep. No. Br9-1-113) Washington, D.C.: United States Government Printing Office, 1971.
- Dyer, Henry S. How adequate are the admissions tests? Moravia, New York: Chronicle Guidance Publications, Inc., 1963.
- Foster, James M. and David G. Danskin. The American College Test (ACT) tested three ways. The Personnel and Guidance Journal, 1965, 43, 904-909.
- Gell, Robert L. and David F. Bleil. Grades--scores--predictions: A study of the efficiency of high school grades and American College Test scores in predicting academic achievement at Montgomery College. Rockville, Maryland: Montgomery College, 1971.
- Hendrix, Vernon L. Prediction of grade point average and selected course grades from ACT testing program scores and status as high school graduates. (Rep. No.-DCJCD-RS-68-3) Texas: Dallas Junior College District, 1968.
- Hopper, Harold H. Predictors of college success. Washington, D.C.: United States Government Printing Office, 1968.
- Hoyt, Donald P. Forecasting academic success in specific colleges. (Research and Development Division Rep. No.-ACT RR - 27) Iowa City: American College Testing Program, 1968.
- Jex, Frank B. Predicting academic success beyond high school. Salt Lake City: Utah University, 1960.

- Layman, Laretha. Prediction of freshman and sophomore grade point averages of women physical education major students. Educational and Psychological Measurements, 1967, 27(4) 1139-1141.
- Lewis, John W. Pre-college variables as predictors of freshman, sophomore and junior achievement. Educational and Psychological Measurements, 1964, 21(2) 707-708.
- Ludenia, Krista. Academic prediction and the marginal student. Columbia: Missouri University, 1970.
- Mann, Jacinta M. The predictability of achievement in a liberal arts college. Educational and Psychological Measurements, 1961, 21(2), 834-837.
- McCormic, James H. and William Asher. Aspects of the high school record related to the first semester college grade point average. The Personnel and Guidance Journal, 1964, 42(7), 699-703.
- Morgenfeld, George Robert. The prediction of junior college achievements from adjusted secondary school grade average. (Doctoral dissertation, Arizona University) Ann Arbor, Michigan: University Microfilms, 1967, No. 44-107.
- Munday, Leo A. ACT testing program factors influencing the predictability of college grades. American Educational Research Journal, 1970, 7(1), 99-107.
- Passons, William R. Predictive validity of the ACT, SAT, and high school grades for first semester grade point average and freshman courses. Educational and Psychological Measurements, 1965, 25 1149-1151.
- Pemberton, W. A. The grade point average: Snark or boojum? Newark: Delaware University, 1970.
- Perkins, Stanley A. An examination of five different groups of first year students at the University of Lethbridge on the college qualification test and grade point average. Alberta: Lethbridge University, 1968.
- Perlberg, Arye. Predicting academic achievements of engineering and science students in Israel. Paper presented to the American Education Research Assoc., Chicago, February, 1968.
- Scannell, Dale P. Prediction of college success from elementary and secondary school performance. Journal for Educational Psychology, 1960, 51(3), 130-134.

Traxler, Arthur E. and Agatha Townsend. Improving transition from school to college. New York: Harper and Brothers, 1953.

Williams, Robert A. An assessment of the success of average high school graduates in Grand Rapids Junior College. (Doctoral dissertation, Michigan State University)
Ann Arbor, Michigan: University Microfilms, 1963
No. 48-106, 64-7556.

Willingham, Warren W. Erroneous assumptions in predicting college grades. Journal of Counseling Psychology, 1963, 10(4), 631-634.