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THE EFFECTIVENESS OF THE HIGH SCHOOL RECORD
AS A PREDICTOR OF ACADEMIC SUCCESS FOR
FRESHMAN STUDENTS AT MICHIGAN STATE
UNIVERSITY.

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THE EFFECTIVENESS OF THE HIGH SCHOOL RECORD AS A
PREDICTOR OF ACADEMIC SUCCESS FOR FRESHMAN
STUDENTS AT MICHIGAN STATE UNIVERSITY

By

Robert L. Maurovich

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1978

ABSTRACT

THE EFFECTIVENESS OF THE HIGH SCHOOL RECORD AS A PREDICTOR OF ACADEMIC SUCCESS FOR FRESHMAN STUDENTS AT MICHIGAN STATE UNIVERSITY

By

Robert L. Maurovich

The purpose of the study was to determine if any significant difference existed between an academic and total subjects high school grade-point-average (GPA) to predict academic success for freshman students at Michigan State University. To accomplish this purpose, a historical perspective was developed and a survey of the related literature and a statistical study were conducted.

The historical perspective demonstrated that the use of the college preparatory program to predict academic success in college evolved from considerations of institutional expediency and convenience and a need for uniformity in college entrance requirements between institutions. Intended as a quantitative measurement of the high school curriculum, the college preparatory program gradually achieved so much importance that the GPA

attained in college preparatory subjects was utilized by most offices of admissions as the primary criterion of admission.

The survey of the related literature revealed that predicting college success from achievement in the high school program of studies is a well-established principle. It was also noted that there was much less than universal support for the proposition that a GPA computed only for academic subjects in high school served as a better predictor of success in college than did a GPA which incorporated all subjects taken in high school.

The statistical study was designed and conducted to determine if any significant difference existed between the use of an academic and total subjects high school GPA to predict success in college. For statistical purposes, the null hypothesis to be tested was:

There is no significant difference between the value of the all subjects record and the academic high school record to predict the academic success of freshman students for the Fall Term of 1975 at Michigan State University.

A modified random sample of 1,140 freshman students of the 7,086 freshman students who entered Michigan State University for the Fall Term of 1975 was selected. The statistical study consisted of a multiple correlation and regression analysis. Correlation coefficients were determined for the academic high school GPA, the total

subjects high school GPA, American College Test scores and the collegiate academic GPA for the Fall Term of 1975. Differences in correlation coefficients were also analyzed in terms of sex and curriculum. The level of significance employed in this study was .05. To determine significance of the difference between the correlation coefficients, a measured R SQUARE value equal to or less than .05 was utilized.

The major finding of the study was that no significant statistical difference existed between the academic and total high school subjects GPA to predict academic success. In addition, no significant statistical difference existed when sex and curriculum were considered. Accordingly, the null hypothesis was accepted.

In view of the above findings, it could be postulated that the total high school GPA could be used in lieu of the academic GPA as the major admissions criterion for freshman students. However, a replication of this study for other freshman classes at Michigan State University and other institutions of higher education with selective admissions programs is required before the findings of this study could be applied in actual practice.

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CHAPTER I

A STATEMENT OF THE PROBLEM

Perspective

The next decade will be a difficult one for higher education. It appears that a significant problem will be a decrease in the size of the college-bound population. One forecast is for 15 percent fewer high school graduates by 1985.¹ This problem has many ramifications for higher education. The spectre of reduced enrollments will affect every sector of college and university life.

Offices of admissions will be acutely affected, for it is the responsibility of these offices to recruit and matriculate the number of qualified students necessary for the sustenance of an institution of higher education. The task of admissions personnel will become even more difficult as the potential number of prospective applicants decreases and the competition for those students intensifies.

¹Fred J. Beamer and Martin M. Frankel, "Projections of Educational Statistics: 1980-1990," National Center for Educational Statistics Publication, 1976, p. 81.

A thorough review and assessment of the philosophy, policy and practices of offices of admissions is necessary. Otherwise, the solution to this problem will be characterized by ineffectual recruitment and retention gimmicks.

A Statement of the Problem

Admission to a college or university is premised upon some indication, usually evidence in the form of documentation, that the applicant possesses the ability or potential to succeed in college-level studies. Some form of evaluation, therefore, is integral to most admissions programs to assess if the applicant possesses this ability or potential.

The Office of Admissions and Scholarships at Michigan State University adheres to the principle that an applicant's achievement in high school academic subjects is the most effective predictor of the student's ability. A review of the informational materials disseminated by the Office of Admissions and Scholarships illustrates the paramount importance of this principle.

The University Catalogue states that "the admission decision takes into account all available information: grades, class rank, test scores, principal-counselor recommendations, caliber of high school program, leadership qualities, citizenship record; but of these, the

most important item is always high school achievement."²

The Information Brochure clarifies the meaning of high school achievement; a prospective applicant is

. . . advised to pursue a solid background in academic areas, i.e., English, Social Studies, Science, Mathematics, and Foreign Language. Art, Performing Music, Physical Education, Commercial, Vocational, and similar subjects will not generally be used in our evaluation.³

If this assessment of high school achievement is inappropriate, two major consequences are apparent. First, some students may be unnecessarily denied admission. Whitney and Boyd have demonstrated that ". . . more selective colleges tend to make a lower proportion of correct decisions than non-selective colleges."⁴ Inappropriate admissions criteria increase the probability of incorrect decisions and admission may be denied to qualified applicants. In view of projected decreased enrollments, institutions can ill afford such a costly mistake. Second, an office of admissions may be administered inefficiently.

²Michigan State University Publication, "Academic Programs: 1974-1976," p. 5.

³Michigan State University Publication, "Information Brochure for Prospective Freshman Students: 1974-1975," p. 4.

⁴Douglas R. Whitney and Norlin W. Boyd, "Limiting the Effect of Predictive Validity on the Expected Accuracy of Admissions Decisions," College and University 46 (Spring 1971): 188.

Inappropriate admissions criteria perpetuate unnecessary tasks and increase costs.

At Michigan State University, eight clerical-technical personnel "compute an academic grade point average for applicants which includes only those grades earned in the academic subject matters of English, science, social studies, mathematics and foreign language."⁵ This procedure is the most time-consuming activity associated with the review of the application for admission. If this procedure were to be deemed inappropriate, the time required to process the application could be reduced. Applicants could be notified of the status of their admission more expeditiously. Such prompt notification would enhance the image of an admissions office as responsive, efficient and concerned with the applicant as an individual. Labor and cost savings could be directed to other endeavors associated with the recruitment, retention and matriculation of new students. In view of current budgetary constraints, efficient and effective management of office personnel and resources would be mandated.

Because of the importance attributed to the academic high school record as a determinant of admission, one would assume this principle of assessment is premised

⁵Letter from Director, Office of Admissions and Scholarships, Michigan State University, to Principals, Directors of Guidance and Counselors, September 1976, p. 2.

upon extensive research theory and evidence. As Bloom and Peters have indicated, "the problem of predicting college success has probably received more public attention than any other single problem in education."⁶

A survey of the literature indicates the pre-eminence of the high school record as the best predictor of success in college. Lavin has concluded that "in studies of academic achievement, the traditional criterion of performance is the student's grades."⁷ Despite the use of other criteria, ". . . in the overwhelming number of cases, student grades are the sole index of performance."⁸

Donahue and Coombs relate that "the value of high school grades for predictive purposes is undoubtedly a result of the fact that they represent a combination of ability and motivational factors operating in much the same way as they will operate in college."⁹ As Rich and Garrett concluded:

⁶ Benjamin S. Bloom and Frank R. Peters, The Use of Academic Prediction Scales for Counseling and Selecting College Entrants (Illinois: The Free Press of Glencoe, Inc., 1961), p. 6.

⁷ David E. Lavin, The Prediction of Academic Performance (Hartford: Connecticut Printers, Inc., 1965), p. 14.

⁸ Ibid.

⁹ Wilma T. Donahue, Clyde H. Coombs, and Robert M. W. Travers, The Measurement of Student Adjustment and Achievement (Ann Arbor: University of Michigan Press, 1949), p. 155.

The school record is not only the best single predictor, but it is the firm foundation in terms of which all other variables can be interpreted. What else is there which predicts as well the likelihood that a student once admitted to college will operate effectively in an academic atmosphere than a record of his performance in a similar environment.¹⁰

However, Fryer and Henry have concluded that

. . . studies have failed to reveal any significant relationship between particular secondary school curricula followed and success in college. There seems to be little or no evidence to support the traditional college policy of requiring high school subjects or fixed numbers of credits in such subjects.¹¹

If a survey of the literature reveals that the academic high school record is not the most efficient and effective predictor of success in college, then current admission criteria, exemplified by the Office of Admission at Michigan State University, is inappropriate. To determine if admissions criteria which emphasize high school achievement in academic subjects is appropriate or inappropriate, a research study is warranted.

Purpose of the Study

The purpose of this study is twofold. First, to determine what difference exists between the academic subjects high school record and the all subjects high school

¹⁰Catherine R. Rich and Thomas A. Garrett, Philosophy and Problems of College Admission (Washington, D.C.: The Catholic University of America Press, 1963), p. 64.

¹¹Douglas H. Fryer and Edwin R. Henry, Handbook of Applied Psychology (New York: Rinehart and Company, 1950), p. 451.

record to predict academic success for freshman students at Michigan State University. Second, to assess whether the magnitude of this difference is so significant statistically as to warrant the continued use of the academic subjects high school record as the primary determinant of admission.

Methodology

To accomplish the above purpose of this study, a historical perspective will be presented and a survey of the related literature and a statistical study will be conducted. For statistical purposes, the null hypothesis to be tested will be:

There is no significant difference between the value of the all subjects high school record and the academic high school record to predict the academic success of freshman students for the Fall Term of 1975 at Michigan State University.

The statistical study, to involve a modified random sample of freshman students who entered Michigan State University for the Fall Term of 1975, will consist of a multiple correlation and regression analysis. Correlation coefficients will be determined for the academic high school record, the all subjects high school record, standardized test scores and the collegiate record for the Fall Term of 1975. A comparative analysis of these coefficients will be conducted that will include a

determination of the magnitude and significance of the two high school records in terms of the total random sample, by sex and curriculum.

CHAPTER II

A HISTORICAL PERSPECTIVE

The use of the academic high school record as a primary determinant of admission derives from the importance attached to the high school college preparatory program. High school officials are advised by the Office of Admissions at Michigan State University that the high school record of each applicant will be evaluated via the computation of a grade point average "which includes only those grades earned in the academic subject matter areas of English, science, social studies, mathematics and foreign language."¹²

A historical perspective of the high school college preparatory program is, therefore, essential to the purpose of this study. An understanding of the origin of the college preparatory program and its evolution as both an admissions requirement and a predictive instrument is essential if one is to comprehend how the college

¹²Michigan State University Publication, "Letter from the Director, Office of Admissions and Scholarships, Michigan State University to Principals, Directors of Guidance and Counselors," September 1974, p. 2.

preparatory program became a significant principle of evaluation in admission programs.

The Early Years: 1600-1700

The genesis of higher education in America was religious in nature. The primary purpose of higher education was to prepare men for leadership roles within the church. Harvard ". . . was conducted as a theological institution, in strict coincidence with the nature of the political constitution of the colony, having religion for its basis and chief object."¹³

Knowledge of Latin and Greek was essential to any scholarship in colonial America. Latin was the language of the church, of law and of medicine. Greek was the language of the New Testament. Because Latin, more than Greek, was the language of scholarship, most scholarly documents and educational materials, to include grammar texts, were in Latin.

One author has cited that "getting into a college or university has become a complicated and often a baffling experience."¹⁴ However, the admission requirement for

¹³Edwin C. Broome, A Historical and Critical Discussion of College Admission Requirements (New York: Columbia University Press, 1903), p. 14.

¹⁴Benjamin Fine, Admission to American Colleges: A Study of Current Policy and Practices (New York: Harper and Brothers, 1946), p. 1.

Harvard in 1638 was relatively uncomplicated: "When any scholar is able to understand Tully or such like classical Latine author extemplore, and make prose, sue ut aiunt Marte, and decline perfectly the paradigms of nounes and verbes in the Greek tongue; Let him then, and not before, be capable of admission into the college."¹⁵

The procedure by which one was admitted was also uncomplicated:

The catalogue for the University of Notre Dame in 1867 states that although the fall semester began on the first Tuesday in September, prospective students could enroll at any time during the year. . . . The applicant simply described his previous schooling in an interview with the director of studies . . . who then assigned the student to the proper level of achievement.¹⁶

1700-1800

One hundred years elapsed before any subject other than Latin and Greek comprised the admissions requirements of any institution of higher education. In 1745, elementary arithmetic at other institutions occurred gradually. It was not until 1800 that elementary arithmetic was added at Harvard. Princeton, founded in 1748, did not add arithmetic until 1760.

¹⁵Howard Greene and Robert Minton, Scaling the Ivy Wall: Getting into the Selective Colleges (New York: Abelard-Schuman, 1975), p. 31.

¹⁶James W. Arnold and Ralph E. Weber, Admission to College (Milwaukee: The Bruce Publishing Company, 1964), pp. vi-vii.

The addition of arithmetic did not represent a significant change in the philosophy of admissions requirements. It simply acknowledged the need for familiarity with elementary computations. Ministers, for example, required this knowledge to maintain church financial records and to monitor personal expenses.

Columbia was the first institution of higher education, in 1785, to quantify admissions requirements.

No candidate shall be admitted into the College, after the second Tuesday in April 1786, unless he shall be able to render into English Caesar's Commentaries of the Gallic War, the four Orations of Cicero against Catiline, the four first books of Virgil's Aeneid, and to explain the government and connection of the words, and to turn English into grammatical Latin, and shall understand the four first rules of Arithmetic, with the rule of three.¹⁷

The College of William and Mary added French to its admissions requirements in 1793.¹⁸ However, foreign language would not be added by most other colleges and universities as an admissions requirement until fifty years later.

1800-1850

Although geography was added to the admissions requirement at Harvard in 1807, it did not represent any significant change in Harvard's commitment to a classical

¹⁷Broome, p. 41.

¹⁸Frederick Rudolph, The American College and University (New York: Random House, Inc., 1962), p. 38.

education, i.e., the study of Latin and Greek. By geography, Harvard meant ancient geography and it was intended to aid a student's understanding of biblical studies.¹⁹

In 1819, English grammar was added to the admissions requirements at Princeton. Algebra was added at Harvard in 1820. Columbia included French in 1830 and Harvard added geometry in 1844.²⁰

The admissions requirements for the University of Michigan in 1841 were representative of the changes, though minimal, which had evolved in admissions requirements since 1638. "Geography, arithmetic, the elements of algebra, the grammar of English, Latin and Greek languages, of the exercise and reader of Andrews, Cornelius Nepes, Vita Washingtonii, Sallust, Cicero's Orations, Jacobs' Greek Reader, and the Evangelists."²¹

In 1847, ancient history was added to the admissions requirements at Harvard. By 1869, United States history and, in 1870, physical geography were added at the University of Michigan. Princeton, in 1870, added English composition.²²

¹⁹Broome, p. 44.

²⁰Fine, p. 17.

²¹Broome, p. 44.

²²Greene and Minton, p. 35.

1850-1900

After the Civil War, veterans entered colleges and universities in large numbers. Their need for a more pragmatic rather than classical education evolved several changes in admissions requirements. By 1870, eight subjects were formally added to the admissions requirements of most colleges and universities. In addition to Greek and Latin, admissions requirements included geography, English grammar, algebra, geometry, ancient history, physical geography, English composition and United States history.²³

Syracuse University, in 1873, added natural philosophy to its requirements for admission. The gradual changes in admissions requirements affected Harvard which added physical science in 1872, English literature in 1875 and physics in 1876.²⁴

The most significant event in the evolution of admissions requirements occurred in 1886 when Harvard eliminated Greek from its admissions requirements. This action led one Harvard trustee to comment: "Mr. Eliot, more than any other man, is responsible for the greatest

²³Broome, p. 45.

²⁴Ibid., p. 46.

educational crime of the century against American youth--depriving him of his classical heritage."²⁵

By 1890, several institutions of higher education offered three different curricula: a full classical course of study, a semi-classical course of study and a scientific course of study. While these curricula, termed the parallel courses, did not affect admissions requirements, they were viewed by the classically oriented faculty as inferior. The parallel courses represented the curricular vanguard of what later became known as the tracking system in high schools (i.e., the college preparatory courses, the technical courses and the noncollege preparatory courses).²⁶

The Annual Report of Harvard, 1870-1871, characterizes the patronizing attitude of the classically oriented academic community toward the parallel courses and its reluctance to oversee any further erosion in the pre-eminence of the classical curriculum.

In many parts of the country it is impossible for young men, however able and studious, to obtain the thoroughness of instruction in the classics which is required for a creditable admission into Harvard College. This fact, taken in connection with the recognition scheme of studies to the truly liberal character of a course of study predominantly scientific, led the Faculty last year to seek some means

²⁵Rudolph, p. 286.

²⁶Broome, p. 84.

by which, without lowering the standard of its admission examinations, the college might be opened to young men whose superior training in mathematics compensated for their deficiencies in the classics.²⁷

The classical orientation would dominate admissions requirements for almost another seventy-five years. In 1900, 402 (or 93 percent) of 432 colleges surveyed required Latin.²⁸ By 1945, the classical orientation was in full decline; only 13 percent of the colleges surveyed required Latin as an admissions requirement.²⁹

In 1870, the University of Michigan established an accreditation system to complement its admissions program. High schools which satisfied the accreditation requirements of the University could, upon the principal's recommendation, have their graduates admitted to the University.³⁰

One of the accreditation provisions listed high school graduation requirements identical to the admissions requirements of the University. Therefore, no articulation problem existed between the University and the high

²⁷Ibid., pp. 89-90.

²⁸Fine, p. 368.

²⁹Ibid.

³⁰Broome, p. 107.

school; the University was assured of the proper preparation of its applicants.³¹

The accreditation system, in retrospect, was the conceptual prototype for the college preparatory program in the high school. The accreditation requirement for a certain grouping of courses in the high school constituted a prerequisite or prescribed course of study for an applicant. As the accreditation system was adopted by colleges and universities, this concept of a prescribed course of study as a prerequisite for admission was also adopted.

By 1872, state universities in Michigan, Minnesota, Iowa and Wisconsin developed accreditation or certification systems with high schools. By 1873, Indiana and Illinois developed accreditation programs and were joined by Ohio in 1874 and Texas, Missouri and California in 1890. By 1900, forty-two state universities and land-grant colleges and at least 150 private institutions had adopted some type of accreditation or certification program.³²

In 1874, a court decision in Kalamazoo, Michigan gave impetus to the growth and expansion of the high school system. The court ruled that high schools could be established and supported by public funds. The high school, as we know it today, did not exist prior to 1874. During

³¹Ibid.

³²Rudolph, p. 284.

the early colonial period, each college maintained a preparatory school. Students deficient in a certain subject would attend the preparatory school, a part of the college, to remove the deficiency. A few private preparatory (or "feeder") schools were later established to educate students for college. The Maryland Act of 1696 was among the first of such legislation to establish such schools. As the number of colleges increased, "academies" were formally established and gradually replaced the "feeder" schools. High schools were later to supplement the academy system.³³

Public demands for a more practical education prompted high schools to provide a curriculum for the non-college bound student. Curricula were designed, for example, to prepare students for a technical career or for life as useful citizens. The college preparatory course of studies, however, still conformed to the entrance requirements for most colleges and universities. As Fred Harclerod notes, however, the development of the high school curriculum, especially the college preparatory course of studies, did not evolve from any philosophy of education. "A philosophy of education does not appear and, as contrasted with the rooted convictions on the purpose of a secondary education to be

³³I. L. Kandel, History of Secondary Education (New York: Houghton Mifflin Company, 1930), p. 450.

found in Europe at that time, the development of the curriculum [of the high school] seems to have been haphazard, vague and opportunistic."³⁴

Similarly, the occasions upon which admissions requirements were established or circumvented illustrates more their function as devices of self-interest, convenience and expediency rather than as instruments of educational philosophy.

Some efforts of the colleges to increase enrollment were more availing than others, but one that did not work was the offer of the University of Arkansas in 1892 to pay \$25.00 to the agricultural student who made the best five pounds of butter. More effective was the almost complete abandonment of admissions standards. In the absence of rural high schools, the colleges merely said: "Come, and we will do what we can." At Ohio State in 1877, for example, by dropping algebra from the entrance requirements, the college immediately picked up twenty students.³⁵

By 1875, the proliferation of high schools and the growth and expansion of colleges and universities, each with different admissions requirements, created sheer chaos in higher education.³⁶ For example, the University of California had thirty different subjects required for admission, Yale and Princeton had thirteen and Harvard twenty-two.³⁷

³⁴Ibid., p. 399.

³⁵Rudolph, p. 260.

³⁶Broome, p. 109.

³⁷Ibid.

In 1879, secondary school and college representatives convened to discuss the need for some standardization in entrance requirements in English for the New England colleges. The meeting culminated in the adoption of uniform admissions requirements for English. In 1881-1882, this group adopted uniform admissions requirements for mathematics. This group, in 1885, founded itself officially as the New England Association of Colleges and Preparatory Schools.³⁸

In 1892, the National Education Association published several guidelines to establish standardized definitions of a credit as a unit of academic work. Kandel characterized these efforts to quantify the high school curriculum as the creation of a "national educational currency."³⁹

However, it was the colleges and universities themselves which initiated and developed uniform admissions requirements. In 1898, Harvard established the point system.⁴⁰ A point was one-half year's academic work in one academic subject.

Harvard required at least twenty-six points for admission. Four points were required in Latin or Greek,

³⁸Kandel, p. 465.

³⁹Ibid., p. 471.

⁴⁰Broome, p. 93.

four points in English, four points in an ancient language, two points in a modern language, two points in elementary history, two points in algebra, two to three points in geometry or plane geometry, two points in one or more of the following subjects: elementary physics, chemistry, anatomy or physiography and two credits in astronomy. The balance of points required was comprised of electives in academic courses of the student's choice.⁴¹

In 1899, the Association of Colleges and Secondary Schools of the Middle Atlantic States and Maryland adopted similar uniform college admissions requirements. By 1900, the North Central Association recommended that no college admit students without a four-year secondary school education. The Association also recommended that admissions requirements be affixed at sixteen credits. A credit was defined as a year's work in a subject for four periods a week. It recommended a student have two years of English, two years of mathematics, one year of science and one year of history to be admitted to college.⁴²

1900-1920

In 1906, the Carnegie Foundation for the Advancement of Teaching in association with the College Entrance Examination Board devised the Carnegie unit. The Carnegie

⁴¹Ibid.

⁴²Kandel, p. 467.

unit was defined as one year's course of study in a major academic subject for five periods a week. A conference on entrance requirements, convened by the Carnegie Foundation in 1908, officially adopted the Carnegie unit as the measure of coursework in the high school curriculum. Rudolph characterized this action as ". . . the ultimate in organization, the epitome of academic accountancy, the symbol of the search for standards."⁴³

These efforts toward uniformity did not evolve from educational philosophy, theory and practice. They evolved from a need to bring order to a setting of conflicting policies and practices. The Carnegie Unit, therefore, was the result of a synthesis of common practices. It became a universal symbol to define a system of credits or to evaluate a diploma.

The uniformity was accomplished by several means. In some cases it evolved through discussion and compromise. In some instances it was incorporated into contractual agreements. As Bowles notes, the Carnegie Unit ". . . became firmly embedded in our system when the Carnegie Foundation for the Advancement of teaching used it as one of their criteria in defining a college for the purpose of their pension program" eligibility requirements.⁴⁴

⁴³Rudolph, p. 428.

⁴⁴F. H. Bowles, "The Evolution of Admissions Requirements," Journal of the Association of College Admission Counselors 17 (1965): 30.

It soon became the norm to require fifteen to sixteen Carnegie units for admission to a college or a university. The core of the Carnegie unit system was four years of English, one year of Algebra, one year of plane geometry, two years of foreign language, one year of natural science (to include biology, chemistry or physics), one year of social studies (to include history, economics or geography) and four years of elective courses in academic subjects of the student's choice.⁴⁵

1920-1940

Three educational developments in the 1920s began to erode the rigidity the unit system imposed upon the high school curriculum. First, the emergence of the concept of individual differences evolved the need for personalized and flexible learning in the high school curriculum. Second, the use of standardized tests provided educators, especially admissions officers, with additional information to select applicants. Third, the influx of veterans from World War I had, as it did after the Civil War, a liberalizing effect upon admissions requirements.

However, educational developments were not the only reason for the partial dissolution of the unit system. As Frank Bowles notes, the erosion of the unit system began ". . . for the far simpler reason that

⁴⁵Fine, p. 16.

colleges could no longer enforce their 60-year-old entrance requirements and at the same time get freshman classes of acceptable size."⁴⁶ During this period, a small college-bound population, a shrinking national economy and the proliferation of small colleges across the nation created many vacancies in entering classes. As Frederick Rudolph noted "between 1890 and 1925 enrollment in institutions of higher education grew 4.7 times as fast as the population."⁴⁷

College entrance requirements were relaxed further during the 1930s. In 1932, Union College abandoned the requirement for a certain distribution of courses in the high school program as an entrance requirement. The University of Chicago followed with a similar policy shortly thereafter. Again, the primary factor in the discontinuation of the unit system of admissions requirements at an increasing number of college and universities occurred for very pragmatic reasons; "during the next seven years a good many colleges, driven more by a need for student enrollments than by any theoretical considerations, indulged in vaguely worded rewritings of entrance examinations which more or less eliminated unit requirements."⁴⁸

⁴⁶Bowles, p. 31.

⁴⁷Rudolph, p. 442.

⁴⁸Bowles, p. 30.

1940-1950

The next significant impact upon college entrance requirements, spanning the 1940s, evolved from United States involvement in World War II. Most colleges and universities modified or abandoned many policies, especially those related to entrance requirements, to serve the war effort.

In cooperation with the Federal Government and the military services, colleges and universities provided the training, expertise and technology to conduct a modern war. To absorb the large number of personnel to be trained for a variety of educational purposes, colleges and universities suspended entrance requirements. The selection of these individuals was accomplished by standardized tests, inventories and interviews. These selection devices were employed by the military services to assess general aptitude as well as the ability to undertake college-level study in particular fields.

After the war, entrance requirements remained suspended at most institutions as tens of thousands of veterans enrolled in colleges and universities. The reasons for the continued relaxation of entrance requirements varied from institution to institution.⁴⁹ Some colleges and universities realized an opportunity to expand their size and enrollment. Other institutions

⁴⁹Ibid., p. 32.

responded to the demand for an education and society's debt of gratitude for service during the war.

1950-1960

The orbiting of the Russian satellite, the Sputnik, in 1957 was a primary reason for the full resurrection of the unit system. The ability of the Soviet Union to surpass the United States in space technology was attributed to a laxness in the educational system in the United States. Accordingly, significant changes were effected in the high school curriculum. Unit requirements were reinstituted and expanded to include additional preparation in mathematics, science and foreign languages.

1960-1970

During the early 1960s, the unit requirements remained in effect. By the late 1960s and early 1970s, however, several factors weakened the dominance of the college preparatory program in the high school curriculum. The involvement of the United States in Vietnam, the civil strife in the cities and campus unrest disillusioned many Americans regarding the ability of education to solve societal problems. The emergence, although brief, of a counter-culture brought about many changes in the educational system.

Amidst allegations of rigid administration, irrelevant curricula and impersonalized learning processes,

many secondary schools developed more flexible and relevant programs of study. Educational requirements were modified; for example, new courses (e.g., ethnic studies, environmental science) were added to the curriculum. Although most high schools retain a policy regarding the number of credits required for graduation, the high school curriculum is no longer characterized by the college preparatory unit system.

The Future

As for the future? It would appear that entrance requirements, as they exist today, will undergo change. Yet this change may not evolve from genuine educational reform so much as from the realities of enrollment-related concerns.

If there is further decline or if there is no substantial increase during the next several years, the period ahead may be an especially appropriate time for high schools and colleges to discuss admission policy. When applications are fewer, colleges are likely to be in a better position to examine their own admission practices and to be somewhat more receptive to curricular innovation at the secondary school level.⁵⁰

Conclusion

It can be concluded, in view of the historical perspective provided, that college requirements have often evolved from institutional patterns related to convenience, circumstance and expediency. As one author noted, "it

⁵⁰ Ibid., p. 31.

became clear that rigorous admissions criteria were often merely administrative devices to reject able students, rather than genuine educational instruments to determine who would benefit most from the institution's program."⁵¹

⁵¹Alvin C. Eurich, "College Admissions in the 21st Century," College Board Review 51 (Fall 1963): 19.

CHAPTER III

A SURVEY OF THE LITERATURE

It was noted in the previous chapter that the high school college preparatory program has served as a major criterion of college entrance requirements. How useful has this criterion been?

The ability to predict academic success in college based upon academic achievement in a high school program of studies has been a widely researched subject of study. Fishman and Pasanella have cited that "admission to college and selection of applicants has probably become the most intensively explored topic in educational-psychological research."⁵²

In a review of almost three hundred articles on this subject, Donahue, Coombs and Travers concluded:

At the present time, the evidence indicates that the best single measure for the selection of the college student is his average grade in high school. Study after study has indicated that the average high

⁵²Joshua A. Fishman and Ann K. Pasanella, "College Admission-Selection Studies," Review of Educational Research 30 (1960): 298.

school grade is a better predictor of college grades than either subject matter or psychological tests.⁵³

Bloom and Peters have also concluded that ". . . in the long history of attempts to improve predictions of college success, high school grades have consistently been found to be the best evidence from which to predict."⁵⁴

The high school record provides historical continuity; it links the future with the past. The ability of the high school record to predict success in college has evolved from "the principle that the best predictions of future behavior can be made from long and careful observation and analysis of relevant past behavior."⁵⁵ As Jencks and Riesman observed: "For colleges are much like [high] schools, and the student who was adept at picking up what was expected of him in school is a good bet to do the same in college, while a student who did not pick up such skills in school is not very likely to do so in college either."⁵⁶

⁵³Donahue, Coombs and Travers, p. 154.

⁵⁴Bloom and Peters, p. 4.

⁵⁵Ibid., p. 155.

⁵⁶Christopher Jencks and David Riesman, The Academic Revolution (Garden City: Doubleday and Company, Inc., 1968), p. 123.

How strong is the evidence to support the predictive ability of the high school record? A survey of the literature indicates it is conclusive.

Approximately two hundred studies, concerning this subject, were conducted from the 1930s through the 1950s. During the 1960s, more than five hundred studies were published.⁵⁷

One of the earliest studies was conducted by Lincoln, in 1917, in which he reported a correlation of .69 between high school standing and freshman college standing. Jordan, in 1922, reported a correlation of .50 between high school grades and college freshman grades. A study by Segal, in 1933, revealed a median value of .55 for the prediction of college achievement based upon average high school achievement. Crawford and Burnham, in their 1946 review of the literature on academic prediction, concluded that .50 was an average correlation between high school and college grades.

Recent studies reveal no significant differences in the conclusions formed in earlier studies. Fishman and Pasanella, in their review of some 260 studies, reported a correlation value of .50 between high school and college grades.⁵⁸ Donahue, Coombs and Travers, in

⁵⁷ Fishman and Pasanella, p. 290.

⁵⁸ Ibid., p. 300.

their survey of some three hundred articles, conclude that "in general, correlations between high school grades and first year college grades are between 0.5 and 0.7."⁵⁹ Cosand, in his review of the literature, reports that correlation values ranging from .50 to .65 "tend to bear out that the average grade is the best single criterion for predicting success."⁶⁰ It is no wonder that Fishman and Pasanella conclude that "academic grades . . . are strongly entrenched as the criteria of selective and guided admission in American higher education."⁶¹

As noted above, the high school record can be a useful predictor of success in college. Yet the question posed by a parent to the President of the College Entrance Examination Board illustrates how the college preparatory program may be a barrier to a student's access to higher education.

We had thought that our daughter was in the college preparatory course but now find, after two years, that she was in what the school calls the general course which colleges won't accept. She has been making good grades and the school says she is college material, if only she had taken the right courses. What do we do to prepare her for college?⁶²

⁵⁹Donahue, Coombs and Travers, p. 155.

⁶⁰J. P. Cosand, "Admissions Criteria: A Review of the Literature," California Journal of Secondary Education 28 (1953): 14.

⁶¹Fishman and Pasanella, p. 306.

⁶²Bowles, p. 31.

Several studies suggest that the ability of a student to succeed in college may not be due so much to the traditional college preparatory curriculum as to factors such as aptitude and motivation. Aymer J. Hamilton has concluded that ". . . there is no evidence to prove that students who came to college with traditional subjects do better work than those who do not."⁶³ His study of 774 students at Ohio State University indicated that students without the traditional college preparatory program (i.e., preparation in six academic subject areas as recommended by the college) did not differ in their academic achievement from students with the traditional college preparatory curriculum.

J. A. Yates, in a study of 706 graduates of the Universities of Cincinnati, Kentucky and Indiana, reviewed the academic progress of these students while in college in terms of their high school curricula. The curricula of these students were comprised of the four general high school courses of study: academic, general, scientific and vocational. He concluded:

There is no evidence that the traditional academic subjects either singly or in groups have any greater educational value for the individual either for life or for college preparation as compared with vocational and other subjects, and prescriptions in them for college entrance should be reduced to what can be justified. . . . Colleges

⁶³Fine, p. 85.

are surprisingly slow to change entrance requirements even in view of the evidence; and they are themselves not doing enough research to develop and perfect improved methods of selecting students.⁶⁴

Donahue, Coombs and Travers have similarly concluded:

Study after study has shown, however, that there is practically no relation between pattern of high school credits and success in college. . . . Similarly, the advantage of studying certain subjects in high school as background for specific college courses seems to have been greatly overemphasized. . . . Consequently, it may be said that the practice of college admissions officers of requiring certain high school courses, or certain prescribed sequences, lacks support of any kind from careful systematic investigation.⁶⁵

Another study, conducted at the University of Florida, concluded: "Our experience in the past ten years has demonstrated to our satisfaction that the most important factors in judging the high school record was level of achievement in subjects attempted than in the presentation of any set pattern."⁶⁶ As Fine observed, ". . . it is not altogether evident that a student who has taken a vocational or a commercial program will not be able to fit into the college life."⁶⁷

⁶⁴Ibid., p. 98.

⁶⁵Donahue, Coombs and Travers, p. 159.

⁶⁶Fine, p. 179.

⁶⁷Ibid., p. 99.

Alexander Astin, in his discussion of predicting academic performance in college, noted:

Students majoring in business, education and physical education tend to get lower freshman GPA's than students majoring in other fields. However, when high school grades, aptitude test scores and college selectivity are controlled, these relationships disappear. In other words, the lower grades received by students majoring in the three fields can be attributed entirely to their somewhat lower average ability and not to any "difficulty" inherent in the fields themselves.⁶⁸

Similarly, Paul Dressel notes, "the pattern of courses taken in high school seems to have little bearing on college success, and a number of authorities have, for years, recommended abandoning this requirement."⁶⁹

It is interesting to note that many studies utilize the grade-point-average reported by the high school. For example, Fryer, in his study, used "the correlation between average secondary school marks and average college marks at the close of the first year of college."⁷⁰ Because these averages reflect achievement in all coursework attempted, it appears most studies do not control for academic coursework only.

⁶⁸Alexander W. Astin, Predicting Academic Performance in College (New York: The Free Press, 1971), p. 13.

⁶⁹Paul L. Dressel, Evaluation in Higher Education (Boston: Houghton Mifflin Company, 1961), p. 316.

⁷⁰Fryer and Henry, p. 450.

In a study on academic prediction for selecting college entrants, Bloom and Peters concluded,

. . . there have been a large number of efforts to include or exclude other variables to predict academic success in college. For example, in using average grades to determine success, marks in such courses as physical education or military training are often excluded. . . . With a few exceptions, such attempts have led to little improvement in the effectiveness of predictions.⁷¹

Probably the most often quoted study of the value of the traditional versus the nontraditional academic program of study as a predictor of success in college is the Eight Year Study which was conducted for entering freshman classes from 1936 through 1940 (with longitudinal studies extended through 1944). It involved a study of some 3,500 students from thirty secondary schools who attended some three hundred colleges and universities. The study controlled for matching groups of students in terms of aptitude, socio-economic status, individual interests (to include sports and hobbies, etc.), academic preparation and achievement in high school and courses of study pursued in college.

The study was designed to determine if the traditional academic program (that exemplified by the 15-16 Carnegie unit system) would prepare students better for college success than students who did not take a college preparatory program. As the study asked:

⁷¹Bloom and Peters, p. 26.

Is the traditional college-entrance program the only safe and sound plan of preparation for college? Or can boys and girls be equally well--or possibly even better--prepared for college through a considerable variety of widely different programs, devised by competent secondary school teachers, with their eyes fixed primarily on the conditions and demands of modern life and the individual capacities and interests of particular students, with only incidental references to the impending college experience? Would students coming up through such a heterogeneous system be able to hold their own in a major college, or would they be foredoomed to failure?⁷²

The rationale for the study was further described as follows:

The secondary schools doubted that success in college depends upon the study of certain subjects for a certain length of time. They questioned the basic assumption upon which college-school relations were based: that only by the study of English, foreign language, mathematics, science, and history could a student be prepared for the work of the liberal arts college.

The schools believed that there are many different avenues of study and experience by way of which young people could develop the skill, understanding, and intellectual maturity necessary for satisfactory achievement at the college level. They were convinced that work in school should have meaning for each student because of its pertinence to his concerns and that such work would develop the powers needed in college.⁷³

The three hundred colleges agreed to accept students from the thirty secondary schools upon only the recommendation of the principal that the student could succeed in college-level studies. The thirty schools

⁷²Dean and Enid Chamberlin and Associates, Did They Succeed in College? (New York: Harper and Brothers, 1942), p. xix.

⁷³Ibid., pp. 22-23.

comprised public and private institutions. They included the Beaver Country Day School in Chesnut Hill, Massachusetts; Milton Academy in Milton, Massachusetts; the Junior and Senior High Schools of Denver, Colorado; Des Moines, Iowa and Tulsa, Oklahoma. The three hundred colleges and universities included Ohio State University, the University of Michigan, Oklahoma A. and M. College, Yale, Amherst, the Massachusetts Institute of Technology, the University of Denver, Bennington College and Bryn Mawr College.

The general conclusions of the study were that the students without the traditional program when compared to students with the traditional program:

1. Earned a slightly higher total grade-point-average
2. Earned higher grade-point-averages in all subject fields except foreign languages
3. Did not differ in times placed on probation
4. Received more academic honors
5. Did not differ in withdrawal rates from college
6. Demonstrated, in terms of nonachievement factors, more intellectual curiosity, objectivity, motivation and resourcefulness

The study demonstrated that

. . . strict reliance on units as a basis for admission to college cannot be considered a valid procedure. The empirical data show either that (1) sheer exposure over a specified period of time to certain courses does not guarantee the

development of basic skills, or (2) that the skills supposedly developed are not essential to successful work in college.⁷⁴

Moreover, as the study concluded, "no college can be justified in setting up requirements for admissions which have been shown to be unnecessary in preparing students to do college work."⁷⁵

One would have postulated that the significant findings of the Eight Year Study would have had a major impact upon college entrance requirements. In a study conducted ten years after the conclusion of the Eight Year Study to assess its impact, William Emanuel noted:

Suffice it to say that the profoundness of the Eight Year Study should well have been a powerful force in molding entrance-requirement policy in the last ten years. Is this, however, the case? For the present at least, a negative answer must be reported.⁷⁶

Ralph Berdie, in his study of 25,000 high school seniors in Minnesota, indicates that ". . . the student's curriculum in high school also bears a relationship to the outcomes of these plans to attend college."⁷⁷ His data revealed:

⁷⁴Ibid., p. 122.

⁷⁵Ibid.

⁷⁶William H. Emanuel, "College-Entrance Requirements Ten Years After the Eight-Year Study," The School Review 61 (December 1953): 522.

⁷⁷Ralph F. Berdie, After High School--What? (Minneapolis: The University of Minnesota Press, 1954), p. 217.

Of those metropolitan boys planning on and attending college, 79 per cent had taken the college preparatory course and only 17 per cent had taken the general course. Only 4 per cent had taken vocational curricula. Of those planning on college but not attending, only 56 per cent had taken the college preparatory course while 33 per cent had taken vocational courses.

In conclusion, if a student was in a high school course appropriate for her after-high-school plans she was more likely to realize these plans than if she was in an appropriate course . . .⁷⁸

Patricia Cross has cited additional evidence to indicate the college preparatory program is not an absolute measure for one's ability to succeed in college. As she noted, ". . . 41 percent of the men who had taken vocational courses of study in high school were actually enrolled in college one year after high school graduation."⁷⁹ As Chamberlin and his associates noted in the Eight Year Study,

. . . perception of subjects, units, and requirements of entrance examinations based upon predetermined subject matter have undoubtedly fixed the pattern of secondary education for the great majority of young people in the United States. Without intending to do so, the colleges have handicapped schools in their attempts at fundamental reconstruction.⁸⁰

It is evident that a college preparatory program may not be the only means by which a student may prepare

⁷⁸Ibid., p. 220.

⁷⁹Patricia K. Cross, New Students and New Needs in Higher Education (Berkeley: University of California Press, 1972), p. 95.

⁸⁰Chamberlin, p. 121.

for college. More importantly, it is evident that a college preparatory program may create or sustain a student's motivation to attend college whereas a general, vocational or technical course of study may not afford a student an equal opportunity for a higher education. Of course, it may be the encouragement of teachers, peer pressure from other college-bound students and familial expectations which account for such differences.

Conclusions

An examination of the origin and development of the high school college preparatory program and an examination of the principle that the achievement of a student in a college preparatory program of studies in high school is the most significant determinant of success in college have been conducted. Several conclusions can be drawn from this examination.

First, the fragile nature of predictive studies concerning success in college should serve more to balance our use of various admissions criteria than to apply any one criterion, such as achievement in college preparatory coursework, as the most significant selective determinant. As Alvin Eurich, in his study of admissions practices, concluded:

Colleges had no really reliable way of measuring their entrants; the main reliance was on aptitude tests which had little value in predicting whether the student possessed the variety of human qualities

required for success in most occupations and professions. Such characteristics as motivation, creativity, perseverance, leadership, concentration, and adaptability were plumbed hardly at all. In fact, the entire admissions process, including the tests, was none too successful at predicting success in college.⁸¹

Second, college entrance requirements have often evolved from institutional patterns related to convenience, circumstance and expediency. "It became clear that rigorous admissions criteria were often merely administrative devices to reject able students, rather than genuine educational instruments to determine who would benefit most from the institution's program."⁸²

Third, admissions policies and practices often are unrelated to educational or societal purposes. While admissions practices emphasize the importance of achievement, ". . . grades don't seem to be related to much of anything except the ability to make similar grades under similar conditions."⁸³ An American College Testing Program study cites that we should be "concerned with finding students who will do outstanding things outside the

⁸¹Eurich, p. 19.

⁸²Ibid.

⁸³Cross, p. 25.

classroom and in later life as well as students who will get satisfactory grades in college."⁸⁴

Fishman and Pasanella have noted:

Perhaps it is typically American that the operational routinization of selection and admission have developed more fully than have consideration for the criteria or the educational-societal goals upon which selection and guided admission must rest. The new influx of intellectual forces in this area may reduce this imbalance by anchoring selection and guided admission in the philosophy of education at one end and in social-science theory and methods at the other.⁸⁵

As David Lavin continues, "to look mainly for students whose academic performance will be high without considering the reasons for our interest in high performance may, in the long run, be unfair to society as well as to the excluded students."⁸⁶ As Cosand concludes, "all . . . admissions policies should be logical outgrowths of the educational philosophy of the institution; and should be made only after careful consideration of the results to be anticipated with regard to the students, the college, the secondary school, and the community or society in general."⁸⁷ It makes little sense, as Alvin Eurich has

⁸⁴American College Testing Programs Publication, "ACT Research Report Number 23," February 1968, p. 8.

⁸⁵Fishman and Pasanella, p. 308.

⁸⁶Lavin, p. 169.

⁸⁷Cosand, p. 13.

noted, to have standards unless we can "relate them to the expected outcomes of higher education."⁸⁸

Fourth, it would appear there is no significant difference between the value of the total high school record and a high school record comprised of only college preparatory subjects to predict success in college. In their appraisal of the continued use of the Carnegie unit system, Traxler and Townsend have provided a characterization appropriate to the concept of the college preparatory program.

It is a truism that educational practices frequently continue in use long after the conditions which brought them into being have changed, and after more effective procedures have been evolved which might well supersede the old ones. Yet outworn practices continue, kept alive by custom, resist nce to change, and inertia.⁸⁹

A historical perspective, a survey of the literature and an accompanying discussion cannot become the means by which these conclusions are accepted or change is effectuated. While these conclusions may compel us to examine current practices and evaluate their effectiveness, only a research study can provide the evidence to determine if a change in admissions policy and procedure is appropriate.

⁸⁸Eurich, p. 27.

⁸⁹Arthur E. Traxler and Agatha Townsend, Improving the Transition from School to College (New York: Harper and Brothers, Inc., 1953), p. 61.

CHAPTER IV

METHODOLOGY

Perspective

To determine the admissibility of an applicant to the freshman class at Michigan State University, the assessment of the high school record is the primary criterion. The assessment of the high school record involves a review of the high school transcript, the deletion of all nonacademic subjects (e.g., music, art, religion) and the computation of a grade-point-average. The computation of this grade-point-average includes the number of credits taken and the grades achieved in the academic subjects (i.e., English, mathematics, science, social studies and foreign language) for the sophomore and junior years. On the basis of this academic subjects grade-point-average, an admission counselor appraises the high school record and, subsequently, determines the admissibility of the student. This procedure for the preparation of an admissions application for review by an admissions counselor conforms to the established policy of the Office of Admissions of Michigan State University that the academic

subjects grade-point-average is a better predictor of success at the University than the total (i.e., all subjects included) high school record.

In the previous two chapters it has been suggested, in terms of a historical perspective and a survey of related research, that the assessment of the academic high school record may not necessarily serve as a better predictor of academic success in college than the all subjects high school record. To evaluate the predictive of both high school records, this study was proposed.

Purpose of Study

The purpose of this study was threefold. First, to determine the predictive value of the academic high school record for the college record earned at the end of the first term. Second, to determine the predictive value of the all subjects high school record for the college record earned at the end of the first term. Third, to determine if any significant difference existed between the predictive value of these two high school records.

If there is no significant difference between the predictive value of these two high school records or a significant difference which favors the all subjects high school record, then it may be appropriate to propose the use of the all subjects high school record as the primary criterion of admission. Because the time and effort

presently expended to determine an academic grade-point-average for each applicant may be unnecessary, the processing of the application for admission may be expedited and various cost savings realized by the University. Consequently, the applicant and the University are better served by the Office of Admissions.

If there is a significant difference between the two high school records which favors the academic high school record, then it may be concluded that the use of the academic high school record as the primary criterion of admission is appropriate. Accordingly, the Office of Admissions may be assured it continues to serve the best interests of its applicants and the University.

Selection of Data Elements

To determine the predictive value of the two high school records, four data elements were required: the academic high school record, the total subjects high school record, the college record at the end of the first term and standardized test scores. Because the admissibility of an applicant is often determined by a review of both the high school record and standardized test scores, it was necessary to include both criteria.

Although the sex and intended curriculum of the applicant are not factors in the determination of admissibility, they were utilized for analytical purposes in

this study. Because the academic grade-point-average computed by the Office of Admissions is often utilized for academic advisement purposes, it was essential to determine if the use of an alternative assessment of the high school record (i.e., the all subjects grade-point-average) would adversely affect the student or the college.

Definition of the Data Elements

The following data elements were utilized in this study. To insure a proper understanding of these terms and their use, the following definitions are provided.

High School Record.--The grade-point-average (GPA) achieved by the student in high school was reported as the high school record. The GPA appeared as a three-digit number (e.g., 3.56) within a four-point system. In some instances, a GPA higher than 4.0 (e.g., 4.07) was reported because honors courses possessed a higher point value than nonhonors courses (e.g., an A earned in an honors chemistry class has a value of five points while an A earned in a regular chemistry class has a value of four points).

Academic GPA.--This GPA included only "academic" (i.e., English, mathematics, science, foreign language and social studies) high school courses. The GPA was computed only for academic subjects which appeared on the

high school transcript and incorporated the number of credits taken, the grades earned and the point value of the grade (e.g., A = 4 points).

All Subjects GPA.--This GPA was reported by the high school and appeared on the high school transcript. It included all subjects and was computed by the high school to include the number of credits earned and the point value of the grading system (e.g., A = 4 points, B = 3 points).

Test Scores.--Standardized test scores, the Scholastic Aptitude Test (SAT) or the American College Test (ACT), are required by the University for admissions purposes. Because the majority (86 percent) of entering freshman students have ACT scores reported to the University, these test scores were used in this study. They provided the largest group of available data and were the most representative test score of entering freshman students. Because the ACT Composite score is a weighted average of the other four reported subject scores (English, Mathematics, Natural Science and Social Science) and is usually the test score determinant for admissibility, it was used in this study.

Academic Success.--Academic success was defined as the completion of the first term (Fall) of the freshman year. It was unnecessary to further restrict this

definition to the attainment of a specific GPA or to the completion of the second or third terms of the freshman year for two reasons. First, academic dismissal will not occur after the first term of study, regardless of the GPA earned. Second, various persistence studies of freshman students at Michigan State University reveal no significant difference between the GPA earned the first term and at the end of the freshman year.⁹⁰

College Record.--The college record was the GPA attained by freshman students at the conclusion of the Fall Term of 1975. The Fall Term of 1975 was selected because it provided the most recent and accessible data available (e.g., the high school transcript) and the size of that entering class was typical of recent freshman enrollments at Michigan State University.

Freshman Students.--The policy of the Office of Admissions stipulates that qualified applicants are admitted as freshmen when they have attempted either no coursework at another college or university or that such coursework attempted does not exceed twenty-four semester hours or thirty-six quarter hours. Freshman students are assigned a student number at the time of admission.

⁹⁰Charles H. Eberly, "Survey of Persistence Studies of Freshman Students at Michigan State University," Office of Evaluation Services (Internal) Report, Michigan State University, 1971, p. 34.

Subjects were selected for this study on the basis of the student number block existent for freshman students for the Fall Term of 1975.

Curriculum.--The college of the declared major rather than the major of the students for the Fall Term of 1975 was selected for curricular analysis for two reasons. First, the admissibility of a student is not determined by the intended major of study. Any analysis of data by major, for the purpose of this study, would be irrelevant. Second, the large number of majors (almost two hundred) and the small if nonexistent number of freshman students in any one major would provide little or no data for analysis and such data as may be available would be inconclusive.

Sex.--Students were designated as male or female.

Significant Difference.--This data element will be defined following a statement of the hypothesis and the statistical methodology to be employed to test the hypothesis.

Statement of Hypothesis and Methodology

A statistical study requires the formulation of a hypothesis and the construction of a methodology by which the hypothesis is accepted or not accepted. The hypothesis, in this study, provided the framework within which

statistical measurement and analysis provided evidence to determine whether there was any significant difference between the predictive value of the academic GPA or the all subjects GPA for academic success at Michigan State University.

The hypothesis of this study, stated in null fashion, was:

There is no significant difference between the value of the all subjects high school record and the academic high school record to predict the academic success of freshman students for the Fall Term of 1975 at Michigan State University.

The alternative hypothesis was that there is a significant difference between the value of the all subjects high school record and the academic high school record to predict the academic success of freshman students for the Fall Term of 1975 at Michigan State University.

If the null hypothesis is accepted, the alternative hypothesis will not be accepted. If the null hypothesis is not accepted, the alternative hypothesis will be accepted.

A statistical study also requires a methodology by which the data available can be collected, quantified, organized, presented, analyzed and interpreted. Such a methodology also provides the framework by which the hypothesis is tested and subsequently accepted or not accepted.

For the purpose of this study, the methodology employed was a multiple correlation and regression analysis. For prediction studies of similar design, this is a generally accepted methodology.⁹¹

The analysis was developed in three steps. First, multiple correlation coefficients were computed to include the academic GPA, the ACT Composite score and the Fall Term 1975 GPA. Second, multiple correlation coefficients were established for the all subjects GPA, the ACT Composite score and the Fall Term 1975 GPA. Third, the magnitude and significance of the difference between multiple correlation coefficients were determined. In addition, the multiple correlation coefficients were provided and analyzed with respect to the total modified random sample, by sex and curriculum.

The level of significance for this study was .05. This is an acceptable selection for a research study of this design.⁹² Any less stringent level of significance is unwarranted because there is a greater probability then that the hypothesis may be correct but because it cannot satisfy the greater level of significance, it will be rejected unnecessarily.

⁹¹Sidney J. Armore, Introduction to Statistical Analysis and Inference for Psychology and Education (New York: John Wiley and Sons, Inc., 1966), p. 445.

⁹²Ibid., p. 349.

To assess the significance of any difference which may exist between the correlation coefficients for the academic and all subjects GPA groups, it was necessary to develop a statistical test by which the hypothesis was accepted or not accepted. To evaluate the significance of the difference between the multiple correlation coefficients, an R SQUARES value was computed for each multiple correlation coefficient. The R SQUARES values for the all subjects and academic GPA group multiple correlation coefficients was compared and any difference in values measured. Because any difference measured will indicate the degree of variance unaccounted for between the GPA groups, the difference between the R SQUARES measures provided a basis to evaluate if the magnitude of the difference was considered significant. To determine the significance of the difference between the R SQUARES values, a measured value difference equal to or less than .05 was determined as insignificant; any value exceeding .05 was determined as significant.

Selection of the Modified Random Sample

A systematic modified random sample methodology was utilized to secure the group of subjects required for this study. To provide an adequate number of subjects for analysis by sex and curriculum, an equal opportunity for each subject to be selected from the population,

a representative sample and a convenient method of selection, it was decided to select every third student. This use of modified random selection is an acceptable technique for a study of this design.⁹³ The modified random sample was selected from the population of freshman students who had completed the Fall Term of 1975 at the University and for whom ACT scores were recorded as their standardized test scores at the time of their enrollment.

Procedure

The following data were reported for each student in the random sample: sex, college, ACT Composite score, Fall Term GPA, the high school all subjects GPA and high school academic GPA as computed by the Office of Admissions. Data for each student were matched by student number, a referent unique to each student.

Correlation coefficients were computed for the all subjects GPA group and the academic GPA group. The correlation coefficients included three variables: GPA, ACT Composite score and Fall Term GPA.

The data were reported in three stages: for the total random sample, by sex and by college. In each stage the magnitude and significance of the difference between the correlation coefficients for the GPA groups were measured and analyzed.

⁹³Ibid., p. 240.

CHAPTER V

A REPORT OF THE FINDINGS

Selection of the Modified Random Sample

An alphabetical list of 4,230 students was obtained from the University's Student Master File of the freshman students who completed the Fall Term of 1975 and for whom ACT scores were recorded. The selection of every third student produced a modified random sample of 1,410 students.

Procurement of Data Elements

The following data were reported for each student: sex, college, ACT Composite score, Fall Term GPA, the academic GPA as computed by the Office of Admissions and the all subjects GPA as reported by the high school. Data elements to include sex, college, ACT Composite score, Fall Term GPA and the academic GPA as computed by the Office of Admissions were obtained from the Student Master File. The all subjects GPA as reported by the high school was obtained from the high school transcript which accompanied the application for admission. In those instances where no GPA was provided by the high

school, a GPA was computed according to the grading scale utilized by the high school (e.g., A = 5 points) and included all subjects taken. The high school GPA was recorded on the transcript for 57.5 percent (811) of the students and computed for 42.5 percent (599) of the students.

Representativeness of the Modified Random Sample

The modified random sample of 1,410 students was representative of the entering class of 7,086 freshmen. There was little difference between the random sample and the population with respect to sex and curriculum.

For the Fall Term of 1975, 7,086 freshman students enrolled in the University's sixteen colleges. Of this entering freshman class, 51.7 percent (3,663) were women and 48.3 percent (3,423) were men.

The modified random sample was comprised of 52.8 percent (752) women and 47.2 percent (658) men. The difference between the ratio of men in the population and the modified random sample was 1.1 percent. This same percentage also represented the difference between the ratio of women in the population and the modified random sample.

There was little difference between the total enrollment of freshman students in any college and that of the modified random sample. As Table 1 indicates,

TABLE 1

COMPARATIVE DISTRIBUTION OF ENROLLED STUDENTS AMONG THE
COLLEGES FOR THE POPULATION AND MODIFIED RANDOM SAMPLE

College	Population		Modified Random Sample		Difference in Percentages
	Number	%	Number	%	
Agriculture	382	5.4	73	5.2	.2
Arts and Letters	416	5.9	83	5.9	.0
Business	682	9.6	155	11.0	1.4
Communication	281	4.0	45	3.2	.8
Education	292	4.1	59	4.2	.1
Engineering	559	7.9	115	8.2	.3
Human Ecology	194	2.7	54	3.8	.1
Human Medicine	111	1.6	24	1.7	.1
James Madison	131	1.9	26	1.8	.1
Justin Morrill	116	1.6	18	1.3	.3
Lyman Briggs	292	4.1	52	3.7	.4
Natural Science	982	13.9	184	13.0	.9
Social Science	526	7.4	87	6.2	1.2
University	1,562	22.0	344	24.4	2.4
Urban Develop- ment	5	.1	2	.1	.0
Veterinary Medicine	555	7.8	89	6.3	1.5
Total	7,086	100.0	1,410	100.0	

the largest percentage difference was 2.4 and the smallest .1 including those differences which equalled zero.

In two colleges, no difference between the population and modified random sample enrollment was recorded. For eight colleges the percentage difference ranged from .1 to .4. Two colleges had percentage differences of .8 and .9. The other four colleges had percentage differences which ranged from 1.2 to 2.4.

In eight colleges the percentage enrollment of the college was lower in the modified random sample than in the population. The lower enrollment percentages ranged from .1 to 2.4. Six colleges had a modified random sample enrollment percentage higher than that of the total enrollment. The higher enrollment percentages ranged from .1 to 2.4.

These percentage ranges reflect nonsignificant differences between the modified random sample and the population when the number of students is considered. While a difference of 2.4 percent may appear significant, it represents, for example in the University College, a change of only 31 students out of a college population enrollment of 1,562 freshman students or a change of only 7 students out of a modified random sample enrollment of 344 freshman students.

Profile of Total GPA Group
Differences

To illustrate any difference between the academic GPA as computed by the University and the all subjects GPA recorded by the high school, a comparative profile of these two GPA groups is provided. Table 2 presents a frequency distribution of the GPAs for both groups and includes the total random sample of 1,410 students.

The profiles of the academic and all subjects GPA groups were very similar. The mode GPA for both groups was 3.00. The second most frequently achieved GPA for both groups was 4.00. The median academic subjects only GPA was 3.20 and the median all subjects GPA was 3.29. The lowest GPA achieved for the all subjects group was 1.68. The highest GPA achieved for the all subjects group was 4.15. The lowest and highest GPAs attained by the academic GPA group were 1.64 and 4.24, respectively. The mean academic GPA was 3.22 and the mean for the all subjects GPA was 3.29.

The standard deviation for the academic GPA group was .4446 compared to .4228 for the all subjects GPA group. The standard error for the academic and all subjects GPA groups, respectively, was .013 and .012. The variance for the academic GPA was .232 compared with .208 for the all subjects GPA group. The standard error, standard deviation and variance for the all subjects GPA and the academic GPA groups were uniform and consistent for each

TABLE 2

FREQUENCY DISTRIBUTION OF ACADEMIC AND ALL SUBJECTS HIGH SCHOOL GRADE-POINT-AVERAGE FOR MODIFIED RANDOM SAMPLE

GPA	Academic			All Subjects		
	Freq.	Pct.	Cum. Pct.	Freq.	Pct.	Cum. Pct.
1.64	1	0	0	-	-	-
1.68	-	-	-	1	0	0
1.75	-	-	-	1	0	0
1.85	-	-	-	1	0	0
1.92	-	-	-	1	0	0
2.00	1	0	0	1	0	0
2.03	-	-	-	1	0	0
2.04	1	0	0	-	-	-
2.05	2	0	0	-	-	-
2.11	-	-	-	1	0	1
2.12	1	0	0	-	-	-
2.14	1	0	0	1	0	1
2.18	2	0	1	-	-	-
2.20	1	0	1	-	-	-
2.21	-	-	-	1	0	1
2.23	1	0	1	-	-	-
2.25	1	0	1	1	0	1
2.27	-	-	-	2	0	1
2.28	1	0	1	-	-	-
2.29	-	-	-	2	0	1
2.30	2	0	1	-	-	-
2.31	-	-	-	1	0	1
2.32	1	0	1	-	-	-
2.33	-	-	-	2	0	1
2.35	-	-	-	1	0	1
2.36	1	0	1	1	0	1
2.37	3	0	1	1	0	1
2.38	3	0	2	1	0	2
2.39	-	-	-	2	0	2
2.40	1	0	2	2	0	2
2.42	3	0	2	-	-	-
2.43	2	0	2	2	0	2
2.44	1	0	2	3	0	2
2.45	3	0	2	1	-	2
2.46	-	-	-	2	0	2
2.47	1	0	2	3	0	3
2.48	2	0	3	2	0	3
2.49	2	0	3	1	0	3
2.50	3	0	3	10	1	4
2.51	2	0	3	-	-	-
2.52	6	0	3	4	0	4

TABLE 2--Continued

GPA	Academic			All Subjects		
	Freq.	Pct.	Cum. Pct.	Freq.	Pct.	Cum. Pct.
2.53	1	0	4	5	0	4
2.54	1	0	4	1	0	4
2.55	2	0	4	8	1	5
2.56	4	0	4	2	0	5
2.57	5	0	4	5	0	5
2.58	1	0	4	6	0	6
2.59	3	0	5	1	0	6
2.60	3	0	5	11	1	7
2.61	2	0	5	5	0	7
2.62	6	0	5	10	1	8
2.63	4	0	6	7	1	8
2.64	6	0	6	11	1	9
2.65	7	0	7	8	1	10
2.66	5	0	7	9	1	10
2.67	5	0	7	7	1	11
2.68	6	0	8	10	1	12
2.69	5	0	8	5	0	13
2.70	9	1	9	5	0	13
2.71	7	0	9	16	1	14
2.72	5	0	10	7	1	15
2.73	4	0	10	13	1	16
2.74	3	0	10	3	0	16
2.75	18	1	11	20	0	17
2.76	8	1	12	6	0	18
2.77	7	0	12	16	1	19
2.78	3	0	13	8	1	20
2.79	5	0	13	3	0	20
2.80	10	1	14	12	1	21
2.81	10	1	14	12	1	22
2.82	7	0	15	10	1	22
2.83	9	1	16	25	2	24
2.84	8	1	16	3	0	24
2.85	10	1	17	5	0	25
2.86	13	1	18	8	1	25
2.87	5	0	18	12	1	25
2.88	9	1	19	18	1	28
2.89	7	0	19	5	0	28
2.90	10	1	20	9	1	29
2.91	8	1	21	2	0	29
2.92	9	1	21	7	1	29
2.93	10	1	22	12	1	30
2.94	7	0	22	20	1	32
2.95	12	1	23	9	1	32
2.96	15	1	24	4	0	33

TABLE 2--Continued

GPA	Academic			All Subjects		
	Freq.	Pct.	Cum. Pct.	Freq.	Pct.	Cum. Pct.
2.97	8	1	25	2	0	33
2.98	4	0	25	1	0	33
2.99	4	0	25	-	-	-
3.00	35	2	28	52	4	37
3.01	2	0	28	-	-	-
3.02	7	0	29	-	-	-
3.03	8	1	29	5	0	37
3.04	11	1	30	2	0	37
3.05	17	1	31	11	1	38
3.06	12	1	32	20	1	39
3.07	9	1	33	24	2	41
3.08	10	1	33	9	1	42
3.09	8	1	34	2	0	42
3.10	24	2	36	5	0	42
3.11	5	1	36	11	1	43
3.12	12	1	37	25	2	45
3.13	11	1	38	7	1	45
3.14	3	1	38	7	1	46
3.15	11	1	39	5	0	47
3.16	13	1	40	17	1	48
3.17	10	1	41	5	0	48
3.18	7	0	41	19	1	50
3.19	11	1	42	2	0	50
3.20	15	1	43	11	1	51
3.21	6	0	20	9	1	51
3.22	10	1	44	7	1	52
3.23	10	1	45	5	0	52
3.24	11	1	46	9	1	53
3.25	16	1	47	20	1	54
3.26	8	1	47	7	1	55
3.27	13	1	48	3	0	55
3.28	7	0	49	9	1	56
3.29	17	1	50	10	1	57
3.30	13	1	51	5	0	57
3.31	7	0	52	8	1	59
3.32	12	1	52	5	0	58
3.33	12	1	53	10	1	59
3.34	9	1	54	-	-	-
3.35	10	1	55	8	1	59
3.36	15	1	56	5	0	60
3.37	9	1	56	8	1	60
3.38	10	1	57	5	0	61
3.39	10	1	58	7	1	61
3.40	18	1	59	13	1	62

TABLE 2--Continued

GPA	Academic			All Subjects		
	Freq.	Pct.	Cum. Pct.	Freq.	Pct.	Cum. Pct.
3.41	8	1	60	3	0	62
3.42	12	1	60	5	0	63
3.43	10	1	61	6	0	63
3.44	13	1	62	19	1	64
3.45	13	1	63	5	0	65
3.46	7	0	63	2	0	65
3.47	10	1	64	10	1	66
3.48	9	1	65	5	0	66
3.49	3	0	65	-	-	-
3.50	25	2	67	29	2	68
3.51	4	0	67	5	0	69
3.52	13	1	68	4	0	69
3.53	5	0	68	7	1	69
3.54	9	1	69	4	0	70
3.55	14	1	70	13	1	71
3.56	8	1	71	11	1	71
3.57	8	1	71	14	1	72
3.58	12	1	72	20	1	74
3.59	14	1	73	11	1	75
3.60	18	1	74	18	1	76
3.61	7	0	75	6	0	76
3.62	11	1	76	12	1	77
3.63	10	1	76	7	1	78
3.64	9	1	77	11	1	79
3.65	12	1	78	10	1	79
3.66	5	0	78	6	0	80
3.67	20	1	79	16	1	81
3.68	9	1	80	14	1	82
3.69	7	0	81	9	1	83
3.70	15	1	82	8	1	83
3.71	6	0	82	7	1	84
3.72	6	0	83	3	0	84
3.73	7	0	83	7	1	85
3.74	3	0	83	1	0	85
3.75	18	1	85	13	1	86
3.76	5	0	85	9	1	86
3.77	9	1	86	4	0	87
3.78	5	0	86	6	0	87
3.79	7	0	86	4	0	87
3.80	10	1	87	12	1	88
3.81	7	0	88	10	1	89
3.82	8	1	89	7	1	89
3.83	13	1	89	13	1	90
3.84	6	0	89	3	0	91

TABLE 2--Continued

GPA	Academic			All Subjects		
	Freq.	Pct.	Cum. Pct.	Freq.	Pct.	Cum. Pct.
3.85	18	1	91	15	1	92
3.86	6	0	91	7	1	92
3.87	3	0	91	5	0	93
3.88	10	1	92	9	1	93
3.89	4	0	92	6	0	94
3.90	11	1	93	8	1	94
3.91	8	1	94	7	1	95
3.92	7	0	94	4	0	95
3.93	5	0	95	3	0	95
3.94	3	0	95	8	1	96
3.95	9	1	95	10	1	97
3.96	11	1	96	5	0	97
3.97	6	0	97	7	1	97
3.98	4	0	97	2	0	98
3.99	3	0	97	3	0	98
4.00	32	2	99	25	2	100
4.01	1	0	100	-	-	-
4.03	-	-	-	1	0	100
4.04	-	-	-	1	0	100
4.05	1	0	100	1	0	100
4.10	1	0	100	-	-	-
4.15	1	0	100	2	0	100
4.24	1	0	100	-	-	-

dimension measured (sex, curriculum and total modified random sample). These data are provided in summary format for each of the colleges in Table 3.

Analysis of Multiple Correlation Data for Modified Random Sample

A multiple regression coefficient was obtained to establish the relationship between all subjects or academic GPA and ACT Composite score and the Fall Term GPA. A multiple regression coefficient for each GPA group was obtained for the modified random sample of 1,410 students.

The multiple correlation coefficient for the academic GPA and ACT Composite score was .5092. A correlation coefficient of .5101 was obtained for the all subjects GPA and ACT Composite score.

The difference between the two multiple correlation coefficients was insignificant. An R SQUARE values of .2593 and .2601 were computed, respectively, for the academic and all subjects GPA groups (to include the ACT Composite score). The difference in R SQUARE values of .008 fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

Analysis of Multiple Correlation Data by Sex

A multiple regression coefficient was obtained to establish the relationship between the all subjects or

TABLE 3

SUMMARY DATA CHART FOR ACADEMIC AND ALL SUBJECTS HIGH SCHOOL GRADE-POINT-AVERAGE BY COLLEGE

	Sample Size	Academic					All Subjects				
		Mean	Median	SE	SD	Var.	Mean	Median	SE	SD	Var.
University	332	3.213	3.175	.025	.447	.200	3.260	3.245	.023	.432	.187
Agriculture	70	3.189	3.165	.045	.377	.142	3.235	3.210	.043	.365	.133
Business	152	3.103	3.080	.034	.422	.178	3.211	3.220	.032	.399	.159
Engineering	109	3.217	3.220	.045	.467	.218	3.270	3.315	.043	.455	.207
Human Ecology	54	3.183	3.155	.054	.394	.155	3.256	3.225	.054	.398	.159
Natural Science	180	3.275	3.260	.036	.485	.235	3.341	3.395	.033	.447	.200
Veterinary											
Medicine	84	3.323	3.365	.045	.412	.170	3.386	3.412	.043	.401	.161
Education	55	3.182	3.073	.056	.413	.170	3.294	3.270	.052	.398	.158
Communications	44	3.182	3.125	.064	.428	.183	3.225	3.250	.056	.376	.141
Arts and Letters	78	3.287	3.305	.048	.428	.183	3.347	3.358	.044	.403	.162
James Madison	26	3.168	3.185	.087	.443	.196	3.198	3.175	.077	.393	.154
Lyman Briggs	48	3.507	3.705	.066	.454	.206	3.565	3.695	.060	.431	.185
Justin Morrill	18	3.178	3.075	.077	.327	.107	3.214	3.130	.081	.345	.119
Social Science	87	3.152	3.060	.045	.416	.173	3.208	3.200	.041	.380	.145
Human Medicine	24	3.429	3.640	.101	.494	.244	3.459	3.505	.093	.457	.209
Urban Develop- ment	2	2.600	2.600	.050	.071	.005	2.660	2.660	.090	.127	.016
Total	1,410										

academic GPA and the ACT Composite score for male and female students and the Fall Term GPA. The male student academic GPA and ACT Composite score produced a correlation coefficient of .5008. For the all subjects GPA and ACT Composite score, a coefficient of .4980 was reported. The female student academic GPA and ACT Composite score produced a correlation coefficient of .5176. A coefficient of .5219 was achieved for the all subjects GPA and ACT Composite score.

The difference in correlation coefficients for males or females regarding the academic subjects only and all subjects GPA groups was insignificant. The value for males was .2480 for the all subjects GPA group and .2508 for the academic GPA group. The difference in R SQUARE values of .0029 fell within the established range for a value which must be equal to or less than .05 to be considered insignificant. The R SQUARE value for females was .2724 for the all subjects GPA group and .2679 for the academic GPA group. The difference in R SQUARE values of .0045 fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

Analysis of Correlation Data by College

An analysis, by college, of the relationship between the academic and all subjects GPA and ACT

Composite score to the Fall Term GPA was conducted. Multiple correlation coefficients were obtained for the academic GPA and ACT Composite score or the all subjects GPA and ACT Composite score in relationship to the Fall Term GPA.

College of Agriculture

When the academic GPA was combined with the ACT Composite score, a coefficient of .6225 was reported. A coefficient of .6423 was provided when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .3875 for the academic GPA and ACT Composite score coefficient and .4125 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0250, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Arts and Letters

When the academic GPA was combined with the ACT Composite score, a coefficient of .6091 was reported. A coefficient of .6496 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .3710 for the academic subjects GPA and ACT Composite score coefficient and .4220 for the all subjects GPA and ACT Composite score

coefficient. The difference in R SQUARE values, .0510, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Business

When the academic GPA was combined with the ACT Composite score, a coefficient of .5414 was reported. A coefficient of .5226 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .2931 for the academic GPA and ACT Composite score coefficient and .2731 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0200, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Communication Arts

When the academic GPA was combined with the ACT Composite score, a coefficient of .5925 was reported. A coefficient of .5861 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .3510 for the academic GPA and ACT Composite score coefficient and .3435 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0075, was insignificant

because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Education

When the academic GPA was combined with the ACT Composite score, a coefficient of .6670 was reported. A coefficient of .6211 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .4449 for the academic GPA and ACT Composite score coefficient and .3958 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0491, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Engineering

When the academic GPA was combined with the ACT Composite score, a coefficient of .3753 was reported. A coefficient of .3786 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .1408 for the academic GPA and ACT Composite score coefficient and .1433 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0025, was insignificant

because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Human Ecology

When the academic GPA was combined with the ACT Composite score, a coefficient of .4997 was reported. A coefficient of .5242 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .2497 for the academic GPA and ACT Composite score coefficient and .2748 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0251, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Human Medicine

When the academic GPA was combined with the ACT Composite score, a coefficient of .6328 was reported. A coefficient of .6250 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .4004 for the academic GPA and ACT Composite score coefficient and .3906 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0098, was insignificant

because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

James Madison College

When the academic GPA was combined with the ACT Composite score, a coefficient of .7047 was reported. A coefficient of .6753 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .4966 for the academic GPA and ACT Composite score coefficient and .4560 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0406, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

Justin Morrill College

When the academic GPA was combined with the ACT Composite score, a coefficient of .3533 was reported. A coefficient of .3851 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .1249 for the academic GPA and ACT Composite score coefficient and .1483 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0234, was insignificant

because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

Lyman Briggs College

When the academic GPA was combined with the ACT Composite score, a coefficient of .6677 was reported. A coefficient of .6429 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .4458 for the academic GPA and ACT Composite score coefficient and .4214 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0244, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Natural Science

When the academic GPA was combined with the ACT Composite score, a coefficient of .5397 was reported. A coefficient of .5422 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .2912 for the academic GPA and ACT Composite score coefficient and .2940 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0028, was insignificant

because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Social Science

When the academic GPA was combined with the ACT Composite score, a coefficient of .5166 was reported. A coefficient of .5202 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .2669 for the academic GPA and ACT Composite score coefficient and .2706 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0037, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

College of Veterinary Medicine

When the academic GPA was combined with the ACT Composite score, a coefficient of .6063 was reported. A coefficient of .6357 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .3676 for the academic GPA and ACT Composite score coefficient and .4041 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0365, was insignificant

because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

University College

When the academic GPA was combined with the ACT Composite score, a coefficient of .5425 was reported. A coefficient of .5420 was produced when the all subjects GPA was combined with the ACT Composite score.

The R SQUARE value was .2943 for the academic GPA and ACT Composite score coefficient and .2937 for the all subjects GPA and ACT Composite score coefficient. The difference in R SQUARE values, .0006, was insignificant because it fell within the established range for a value which must be equal to or less than .05 to be considered insignificant.

Summary

For eight of the colleges (Agriculture, Arts and Letters, Engineering, Human Ecology, Justin Morrill, Natural Science, Social Science and Veterinary Medicine) the all subjects GPA and ACT Composite score correlation coefficient was higher than that for the academic GPA and ACT Composite score. In seven of the colleges (Business, Communication Arts, Education, Human Medicine, James Madison, Lyman Briggs and University), the academic GPA and ACT Composite score correlation coefficient was higher

than that for the all subjects GPA and ACT Composite score. For the College of Urban Development the coefficients had a perfect correlation value of 1.00; however, a modified random sample of two students and a total freshman enrollment of five students for the college indicates the data are too limited for any meaningful analysis. However, the difference between the correlation coefficients, by college, as measured by the corresponding R SQUARE values, was insignificant for all of the colleges.

The correlation coefficient for the all subjects GPA and ACT Composite score with respect to the modified random sample was higher than that for the academic GPA and ACT Composite score. However, the difference between these correlation coefficients, as measured by the corresponding R SQUARE values, was insignificant.

The correlation coefficient for the all subjects GPA and the ACT Composite score for female students was higher than that for the academic GPA group. The correlation coefficient for the academic GPA and the ACT Composite score for male students was higher than that for the all subjects GPA. However, the difference between the correlation coefficients for male or female students, as measured by the corresponding R SQUARE values, was insignificant.

Disposition of the Hypothesis

For statistical purposes, the null hypothesis tested was:

There is no significant difference between the value of the all subjects high school record and the academic high school record to predict the academic success of freshman students for the Fall Term of 1975 at Michigan State University.

The difference between the correlation coefficients for the all subject and academic GPA groups to include an analysis of the modified random sample, by sex and curriculum, was determined to be insignificant. All of the R SQUARE values were within the established range for a value which must be equal to or less than .05 to be considered insignificant. Difference in R SQUARES values for the multiple correlation coefficients were, respectively, .0008 for the modified random sample, .0028 for males, .0045 for females and ranged from .0006 to .0510 for the colleges.

In view of the above finding, no significant difference between the correlation coefficients for the academic and all subjects GPA groups was determined. Therefore, it can be concluded the null hypothesis can be accepted.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

Overview of the Study

The purpose of this study was to determine if any significant difference existed between an academic and an all subjects high school GPA to predict academic success for entering freshman students for Fall Term 1975 at Michigan State University. To accomplish this purpose, a historical perspective was developed and a survey of the related literature and a statistical study were conducted.

The historical perspective demonstrated that the use of the academic high school GPA to predict academic success in college evolved more from considerations of institutional expediency and convenience and a need for uniformity in college entrance requirements between institutions than an educational philosophy or theory. Intended as a quantitative measurement of the high school college preparatory program, the Carnegie unit system gradually achieved so much importance that the GPA

attained in the college preparatory subjects was utilized by most offices of admissions as the primary criterion of admission.

Evidence was provided in the survey of the related literature that the predictive value of achievement in a high school program of studies for academic success in college has been well established. It was also noted that there was much less than universal support for the proposition that a GPA computed only for academic subjects in high school served as a better predictor of success in college than did a GPA which incorporated all subjects taken in high school.

The statistical study was designed and conducted to determine if any significant difference existed between the use of an academic and an all subjects high school GPA to predict success in college. For statistical purposes, the null hypothesis to be tested was:

There is no significant difference between the value of the all subjects high school record and the academic high school record to predict the academic success of freshman students for the Fall Term of 1975 at Michigan State University.

A modified random sample of 1,410 freshman students of the 7,086 freshman students who entered Michigan State University for the Fall Term of 1975 was selected. The statistical study consisted of a multiple correlation and regression analysis. Correlation coefficients were

determined for the academic high school GPA, the all subjects high school GPA, standardized test scores and the collegiate academic record for the Fall Term of 1975. A comparative analysis of these coefficients was conducted and included a determination of the magnitude and significance of the two grade-point-average groups in terms of the modified random sample, by sex and curriculum. The level of significance employed in this study was .05. To determine significance of the difference between the correlation coefficients, a measured R SQUARE value equal to or less than .05 was utilized.

Summary of Findings

The major finding of this study was that no significant statistical difference existed between the use of the academic and all subjects high school GPA to predict academic success. This finding was applicable for an analysis of the data with respect to the modified random sample, by sex and curriculum.

Resolution of the Hypothesis

The null hypothesis to be tested was:

There is no significant difference between the value of the all subjects high school record and the academic high school record to predict the academic success of freshman students for the Fall Term of 1975 at Michigan State University.

Because no significant statistical difference was established between the correlation coefficients for the academic and all subjects high school record groups, the null hypothesis was accepted.

Implications

Because no significant statistical difference was established between the predictive use of the academic and all subjects high school GPA, it could be postulated that the all subjects GPA could be used in lieu of the academic GPA as the major admissions criterion for freshman students. The use of this criterion of admission, it is believed, would generate cost savings to the University and enable the University to provide more efficient service to its applicants. In the very competitive environment within which offices of admissions are likely to exist for the next five to ten years, these advantages are significant.

Recommendations for Further Research

It was demonstrated in this study that there was no significant difference between the academic and all subjects high school grade-point-average to predict academic success for freshman students for the Fall Term of 1975. To determine whether the all subjects high school grade-point-average could be used as an admission

criterion at Michigan State University and other institutions, it is recommended that:

1. This study be replicated for other entering freshman classes at Michigan State University. Therefore, it can be determined if the findings for the entering class for the Fall Term of 1975 are applicable to other entering classes.
2. This study be replicated in other institutions of higher education which utilize a selective admissions program. Therefore, it can be determined if findings applicable at Michigan State University are appropriate for other institutions of higher education.

It could then be determined if the use of the academic grade-point-average as the primary admissions criterion of admission may represent what Benjamin Fine has suggested as another indication that "college gates are barred by artificial or arbitrary restrictions, by the rigid guardians of tradition or by a host of outmoded educational shibboleths."⁹⁴

⁹⁴Fine, p. 1.

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