SUCCESS IN PROFESSIONAL PHYSICAL EDUCATION AT THE UNIVERSITY OF ILLINOIS (CHICAGO)

THESIS FOR THE DEGREE OF Ed. D.

MICHIGAN STATE UNIVERSITY

SHELDON LEROY FORDHAM

1963

This is to certify that the

thesis entitled

A STUDY OF THE RELATIONSHIP OF SELECTED FACTORS TO ACADEMIC SUCCESS IN PROFESSIONAL PHYSICAL EDUCATION AT THE UNIVERSITY OF ILLINOIS (CHICAGO)

presented by

Sheldon LeRoy Fordham

has been accepted towards fulfillment of the requirements for

Ed.D. degree in Education

Major professor

Date 9/23/63

O-169

A STUDY OF THE RELATIONSHIP OF SELECTED FACTORS TO ACADEMIC SUCCESS IN PROFESSIONAL PHYSICAL EDUCATION AT THE UNIVERSITY OF ILLINOIS (CHICAGO)

by

Sheldon LeRoy Fordham

AN ABSTRACT OF A THESIS

Submitted to

Michigan State University

for the degree of

DOCTOR OF EDUCATION

Department of Health, Physical Education and Recreation

1963

ABSTRACT

A STUDY OF THE RELATIONSHIP OF SELECTED FACTORS TO ACADEMIC SUCCESS IN PROFESSIONAL PHYSICAL EDUCATION AT THE UNIVERSITY OF ILLINOIS (CHICAGO)

by Sheldon LeRoy Fordham

This study was designed to analyze thirty-four variables associated with academic success among freshman male students in professional physical education at the Chicago Undergraduate Division of the University of Illinois. The data used were from the records of 124 students covering a period of four years (1958-62). The variable used as the criterion for academic success was grade point average.

The variables studied were commuting time, occupation of father, education of father, education of mother, extra-curricular participation, high school rank, high school attended, previous grade point average, grade point average by profession of father, grade point average by college, and test scores on the School and College Ability Test, the Bild-Dutton Academic Interest Test, and the United States Army Five-Item Physical Fitness Test.

A separate IBM card was made up for each of the subjects, into which was punched values for each of the variables. Part of the calculations were done by electronic computer. Thus it

was possible to develop the upper correlation matrix consisting of correlations for each variable with the criterion and the correlations for each variable with every other variable. The calculation of Multiple R was completed by hand. A multiple regression analysis was made of the data which resulted in a prediction equation. Seventy-two students in the sample entered the institution directly from high school and 52 students entered from other colleges within the university. These two groups of students were identified as "regular" and "transfer" students respectively. The data obtained on the two groups of students were analyzed separately.

High school rank had the highest correlation with the criterion for regular students ($r = .31$). Previous grade point average correlated .45 with the criterion for transfer students. Four variables for both the regular and transfer students were found to give as much predictive power as could be obtained. The transfer student variables were (1) index for previous college, (2) previous grade point average, (3) interest in geology as measured by the interest inventory test, and (4) high school rank (Multiple $R = .62$). The best set of predictors for regular students were (1) high school rank, (2) high school attended index, (3) fitness test score, and (4) achievement test score in social science (Multiple $R = .48$). A few of the zero order correlation coefficients for regular students were as follows: verbal learning compared with social science achievement, .59; mathematics achievement with natural science achievement, .57; and verbal learning with vocabulary, .56.

Education of father and education of mother correlated .97 for transfer students. Other correlations for transfer students were: quantitative learning with mathematics achievement, .68; verbal learning with vocabulary, .67; and verbal learning with social science achievement, .62. The analysis of students who withdrew indicated that students who participate in intercollegiate and intramural sports are more likely to stay in school. The variables significant at the .05 level, namely, high school rank, verbal learning, mathematics, vocabulary, and grammar were in favor of the students who remained in school. Extra-curricular participation correlated negatively with the criterion for both groups of students. There was a significant difference between the occupation of the father in the two groups of students.

The general conclusions were that high school rank is a valuable criterion in predicting college success, particularly for incoming students directly from high school. However, the previous college record provides the best information for prognosis for students who have been enrolled in other colleges within the university. A formal testing program does not provide ready or complete answers in predicting college success. It is useful in making a contribution to the total situation rather than to a specific case.

A STUDY OF THE RELATIONSHIP OF SELECTED FACTORS TO ACADEMIC SUCCESS IN PROFESSIONAL PHYSICAL EDUCATION AT THE UNIVERSITY OF ILLINOIS (CHICAGO)

by

Sheldon LeRoy Fordham

A THESIS

Submitted to

Michigan State University

for the degree of

DOCTOR OF EDUCATION

Department of Health, Physical Education and Recreation

1963

6/24/64

PREFACE

This study was undertaken to determine the relative value of several selected factors with respect to academic success. The study sample included one hundred twenty-four male students in the College of Physical Education at the Chicago Undergraduate Division of the University of Illinois.

The study was designed to determine the factors related to academic success and to develop a predictive equation which might be used in the selection and retention of male students majoring in physical education. Student withdrawals were also studied to gain further insight into the problem.

Even though there have been several studies related in one way or another to this one, the study samples were quite different because of the nature of the institution. The results of these studies indicate a need for further investigation of the variables related to academic success in college.

The author is indebted to his wife, Margaret Fordham, whose constant encouragement helped make this study possible.

The writer is particularly indebted to Dr. Wayne Van Huss for his guidance and assistance in the organizational phases of this work.

Acknowledgment is also made to James Creaser of the University of Illinois (Chicago) for his help in the statistical analysis.

Sheldon LeRoy Fordham

TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

CHAPTER I

THE PROBLEM AND IMPORTANCE OF STUDY

The problem was to determine the relationship of several selected factors to academic success among freshman male students in the College of Physical Education at the Chicago Undergraduate Division of the University of Illinois.

The objectives of this study were (1) to develop criteria which might prove useful in the selection of college students majoring in physical education, (2) to develop a predictive equation based on the variables used in the study, and (3) to determine some of the basic reasons why students withdraw from the university.

In view of the expanding school population, the problem of the correct choice of a profession and the need for some predictive criteria to use as a means of selection becomes exceedingly more important. Students dropped for poor scholarship or for the various other reasons represent a considerable loss of human resources to society in addition to the almost astronomical cost. We can no longer afford to ignore or blandly dismiss the problem of both the entering and the continuing student. We need to apply realistic research to his problems and the end, which is the dropout, needs to be analyzed in terms of the means that caused the end. The nature

and extent of the college dropout problem may be completely different in one school as compared to another. Therefore, the problem needs to be studied in each school in order to answer such questions as (1) What are dropouts like? (2) What caused them to leave school? (3) How can we identify potential dropouts? (4) How may we evaluate possible remedies?

The limitations of this study were that (1) the data are applicable only to the College of Physical Education at the University of Illinois (Chicago), (2) the validity of some of the instruments used in the comparisons may be open to question, (3) the study is limited to the factors studied, and (4) some of the students may return to the university after withdrawal or academic failure.

Two definitions are necessary in order for the reader to differentiate between the two groups of students in the study sample. "Regular students" refers to those students who entered the College of Physical Education immediately upon completion of high school. "Transfer students" refers to those students who transferred to the College of Physical Education after completing one semester in one of the other three colleges within the university (Commerce, Engineering, or Liberal Arts and Science).

The Chicago Undergraduate Division of the University of Illinois is a two year institution offering courses in four areas: Commerce, Engineering, Liberal Arts and Science, and Physical Education. The school is co-educational, with approximately forty-seven hundred students in full-time at-

tendance. The Colleges of Engineering and Liberal Arts each have approximately two thousand students enrolled. The College of Commerce has approximately five hundred students. The College of Physical Education has an enrollment of approximately one-hundred fifty students, consisting of one hundred men and fifty women. This study was limited to the male students in the College of Physical Education.

CHAPTER II

REVIEW OF THE LITERATURE

Considerable research has been done relative to the drop-out problem on all levels of the educational system. However, the majority of the studies have been completed on the elementary and secondary levels. Many of the investigations also lack adequate statistical evaluation. For the sake of reasonable brevity, only the more pertinent studies are reviewed in the following.

Nardelli, following his analysis of college freshman drop-outs in 1959, made a plea for realistic research on drop-out patterns and asked that educators not accept answers that are too obvious.[1] His analysis of the drop-out pattern showed that much of it could be traced to naive interpretation and manifestation of orientation programs. Further research was recommended, especially to be directed toward determination of the cause of dropouts.

Iffert, in 1956, studied a sample of 14,000 students from 152 institutions.[2] The survival record showed that the probability of graduating from the institution of first regis-

---

[1]W. Nardelli, "An Analysis of Drop-Outs of Freshmen," Junior College Journal, XXIX (February, 1959), 322.

[2]R. Iffert, "The Student Retention and Withdrawal Study," College and University, XXX (July, 1956), 406-411.

tration was in the same order as rank in high school graduating classes. The prospects of graduating were about twice as good for students in the top fifth of their high school class and about eight times as good for those as for the students from the bottom fifth. The percentage reaching university graduation from the third and fourth quintiles of their high school classes was about one-third of that for students from the top fifth. The mortality rates showed that approximately sixty per cent of the students left the university of original registration without a degree and forty-five per cent did not graduate from any college or university during the four year period.

Koelsche interviewed 180 former students at Indiana University between the years 1948 and 1952.[3] He was primarily concerned with isolating the characteristics of those persons who enrolled as freshman students but who withdrew prior to completion of graduation requirements. This study indicated that low scholarship was not entirely dependent upon lack of ability, but rather the result of a number of factors exerting influence on the individual. The reasons listed by students for withdrawal were a combination of lack of funds, low scholarship, contemplated marriage, ill health, and loss of interest. Out of 2,091 new freshman enrollees at Indiana University in September of 1948, 1,173 (56.2 per cent) withdrew without graduating. Twenty-five per cent of these drop-outs

---

[3]C. L. Koelsche, "A Study of the Student Drop-Out Problem at Indiana University," Journal of Educational Research, XLIX (January, 1956), 357-364.

ranked in the highest one-fifty of their respective graduating classes. The median for the group of drop-outs was located in the middle fifth. Twenty-seven and eight-tenths per cent of the fathers of drop-outs were in proprietary and managerical positions, and 15 per cent were skilled laborers. Twenty-nine and four-tenths per cent of fathers of drop-outs had attended college, and 15 per cent had graduated.

Shuman summarized much of the research on college drop-outs in 1956.[4] He stated that, although statistics on drop-outs vary considerably, the consensus was that about 50 per cent of college and university freshmen fail to graduate. It was his opinion that a considerable number of those who drop out might, with proper pre-college guidance, discover abilities to better qualify them for some other pursuits. He envisioned an ideal college program as one that would select students more carefully, orient them more fully, counsel them more effectively, and, in event of withdrawal, interview them and attempt to aid in their fuller development.

Patton, at Louisiana State University for the years 1953-1955, attempted to determine if twenty-one selected factors were significantly related to drop-outs.[5] Students of low socio-economic status were more likely to drop out (P = .05). A low score on the American Council Psychological Exam-

---

[4]R. B. Shuman, "College Drop-Outs: An Overview," Journal of Sociology, XXIX (April, 1956), 347-350.

[5]B. K. Patton, "A Study of Dropouts from the Junior Division of Louisiana State University" (unpublished Doctoral dissertation, Louisiana State University, 1958).

ination and a low point credit ratio was also more prevalent among drop-outs.

Linns and Pitt, in evaluating staying power and rate of progress of University of Wisconsin freshmen, found percentile rank in the high school graduating class and the American Council Psychological Examination test scores were related to college success.[6] Less than 56 per cent of the original group of 1,994 students attained sophomore standing or higher during the second year after entrance. Less than half of the original group was registered the eighth semester after graduation. There was a positive relationship between the number of semesters registered and (a) percentile rank in the high school class with which graduated ($r = .374$), (b) percentile rank on the American Council Psychological Examination (1957 edition) ($r = .288$), and (c) first semester university grade point average ($r = .541$); all correlation coefficients for these variables were significant ($P = .001$).

Fults and Taylor studied 2,462 college freshmen from forty-four different high schools from the standpoint of staying power.[7] In this sample the high schools did not differ significantly. In this study the greatest number of drop-outs came between the end of the freshman year and the end of the sophomore year.

---

[6] L. Linns and H. Pitt, "Staying Power and Rate of Progress of University of Wisconsin Freshmen," College and University, XXIX (October, 1953), 98.

[7] R. S. Fults and S. E . Taylor, "Staying Power of College Students," National Association of Secondary Schools Principals' Bulletin, XLIII (October, 1959), 109.

Michigan State University freshman drop-outs and non-drop-outs were compared by Russell according to six selected factors (occupation of father, high school rating scale, Basic College Inventory of Attitudes and Beliefs, education of parents, sex, and American Psychological Council Examination Test scores). Significant differences (P = .01) between drop-outs and non-drop-outs were found only in education of father and education of parents.[8]

Quarles has suggested sub-freshman non-credit courses and recommended that a final decision should be withheld on admission on conditional or unconditional status until the completion of an orientation program.[9] He concluded that rank in the high school graduating class was a sounder guide than the pattern of courses followed. It was his opinion that a college with an effective guidance program could reduce the number of withdrawals.

Marsh selected nine factors to equate with drop-outs and non-drop-outs.[10] His conclusions indicated that the best predictors of college success were evidences of actual achievement (high school rank, College Board Verbal Scores, and participation in a reading improvement program). Although these

---

[8] J. W. Russell, "A Comparison of Michigan State College First-Term Drop-outs and Non-Drop-outs According to Certain Factors" (unpublished Doctoral thesis, Michigan State College, 1952).

[9] B. Quarles, "Student Separations from Schools," Association of American Colleges Bulletin, XXXV (October, 1949), 408.

[10] R. E. Marsh, Jr., "An Analysis of Failure among University Freshmen" (unpublished Doctoral dissertation, Boston University, 1959).

measures predicted freshman failure with a 70 per cent degree of accuracy, a need for further study was indicated. Commuting time, parental education, participation in extra-curricular activities, regular employment, and a fifth year in secondary school were found to be unrelated to failure.

Yoshimo studied college drop-outs at the end of the freshman year at the State College of Washington in Pullman.[11] In comparing 52 students who remained in school with the 45 who dropped out, the high school grade point average and American Council Psychological Examination scores were significantly higher for those remaining in school ($t = 4.37, 5.19$ respectively; $P = .01$). There was also a significant difference ($P = .01$) between the students who dropped out for academic reasons and those who withdrew owing to other factors ($t = 4.56$, high school grade point average; $t = 4.92$, psychological examination). The significance was in favor of students' withdrawing due to other factors. He emphasized the need for guidance to place the academic setting of college life and the social aspects in proper perspective.

Cumings, following his study of the causes of student withdrawals at De Pauw University,[12] suggested that colleges have an exit interview to help the drop-out crystallize his reasons for leaving and to realize the importance of this deci-

---

[11] R. Yoshimo, "College Dropouts at End of Freshman Year," Journal of Educational Sociology, XXXII (September, 1958), 42.

[12] E. C. Cumings, "Causes of Student Withdrawals at De Pauw University," School and Society, LXX (September, 1949), 152-153.

sion. Such an exit interview eliminates the many general, and usually hazy, reasons given by students who are allowed to withdraw without going through a carefully worked-out procedure.

The United States Office of Education studied the retention and withdrawal of college students.[13] Their findings indicated that a majority of the students who discontinued their higher education program attributed their withdrawals to factors identified with themselves rather than with the institutions they attended. Principal institutional complaints centered on services, notably orientation and teaching, rather than institutional facilities. This study was based on a sampling of approximately 13,700 men and women enrolled in institutions of higher learning in the fall of 1950. It was found that no more than sixty per cent of all students who enter degree granting institutions receive degrees. The first year of college was the most critical drop-out period. Two hundred seventy-three students per thousand left school during the first year in comparison with 283 per thousand during the next three years.

Metzger investigated male graduates and scholastic drop-outs at Cortland Teachers College from the aspect of a group of selected characteristics.[14] Sample students were en-

---

[13] U.S. Office of Education Bulletin, "Retention and Withdrawal of College Students," XV (1958), 177 pp.

[14] S. M. Metzger, "A Study of Selected Characteristics of Male Graduates and Scholastic Dropouts of the 1951 Freshman Class Entering the State University of New York Teachers College at Cortland" (unpublished Doctoral dissertation, New York University, 1959).

rolled in physical education and elementary education curriculums. Findings showed that 85 per cent of the school drop-outs in elementary education achieved a high school grade average below 77 per cent. Achievement of a satisfactory grade point average during the first semester at this institution was significantly related to a high school average of 77 per cent or above.

Rogers interviewed 97 selected freshman students at Appalachian State Teachers College in 1959.[15] His recommendations leading to a reduction of drop-outs from that institution were:

1. Development of a testing and placement service for in-coming students.
2. Strengthening of the present faculty advisory system.
3. Restriction of students to the campus for the first semester.
4. Initiation of an orientation course during the first quarter of the freshman year.
5. Proper handling of student applications for financial aid.
6. Appropriate involvement of students through the student council.

Fenelon investigated the secondary school drop-out

---

[15] L. L. Rogers, "Problem Analysis Study of Selected Freshman Students at Appalachian State Teachers College" (unpublished Doctoral dissertation, University of Tennessee, 1959).

problem at Port Washington, Wisconsin High School.[16] In this questionnaire study of 111 cases it was discovered that many variances existed in this school situation. However, the findings were conclusive enough to show definite relationships between individual backgrounds and leaving school early. He cited a need for study of students' backgrounds and of their influences on leaving. No single reason was found for leaving school early.

In a review of the literature on secondary school dropouts, Tesseneer and Tesseneer discovered that those pupils who engage in at least one extra-curricular activity are much less likely to drop out than those who do not.[17] It was felt that a low income status might affect this factor.

Mowers investigated self-judgments and objective measures as they relate to first semester academic achievement in a group of non-selected college students.[18] Statistical analysis indicated that decile rank in high school and test scores on the Ohio State Psychological Examination were equally effective in the prediction of first semester collegiate academic success. No significant difference was found in the effective-

---

[16]W. J. Fenelon, "A Study of the Secondary School Dropout Problem at Port Washington, Wisconsin High School" (unpublished Doctoral dissertation, Northwestern University, 1960).

[17]R. A. Tesseneer and L. M. Tesseneer, "Review of the Literature on School Dropouts," National Association of Secondary School Principals' Bulletin, XLII (May, 1958), 143-153.

[18]G. E. Mowers, "Self-Judgments and Objective Measures as Related to First Semester Academic Achievement of Non-Selected College Students," (unpublished Doctoral dissertation, Pennsylvania State University, 1960).

ness of one variable over the other. However, it was demonstrated that the proper combination of the variables produced a significantly superior prediction of first semester collegiate grade average over the prediction derived from either variable taken alone.

Fullmer studied the success and perseverance of university students at the University of Denver in 1956.[19] The sample included 1,028 students, and the study was designed to test the hypothesis that students who change educational objectives during their college careers are poor risks for academic success and perseverance. Changing of educational objectives as expressed by a change in major subject was not an indication of weakness on the part of the student. A higher percentage (44.3 per cent) of students graduated from the University of Denver in the "changed" group than did those in the "not changed" group (31.3 per cent). These figures included all the schools at the University of Denver (Arts and Science, Business Administration, and Engineering). Most students retained about the same grade point average following a change of major subject (r = .98). The correlation between freshman grade point average and final grade point average was .90 or higher for each group.

Lynch, in an analysis of drop-outs in three public junior colleges in Florida, found that 34 per cent of the study sample withdrew during the first semester and 30 per cent

---

[19]E. W. Fullmer, "Success and Perseverance of College Students," Journal of Higher Education, XXVII (November, 1956), 445-447.

of the study sample dropped out before completing the two year program.[20] Eighty-six per cent of the drop-outs in the study were freshman students. Student mortality was caused by a constellation of factors. It was recommended that junior colleges consider the advisability of having each freshman select, or be assigned to, a faculty advisor. It was the investigator's opinion that approximately 65 per cent of the drop-outs could have been helped.

Lowe studied capable high school graduates of twenty Illinois high schools.[21] Of the 1,117 subjects in the sample, 542 were in college and 575 were not. The type and number of extra-class activities engaged in while in high school was significantly related to attendance in college (P = .05). Student rank in high school was significantly related to attendance at college (P = .05). The educational level attained by both the father and mother was significantly related to college attendance (P = .05).

Rank in high school graduating class was significantly associated with social factors involved in academic mortality in Slocum's study of 1,019 freshmen entering the State College of Washington (Pullman) in the falls of 1951, 1952, and

---

[20]D. F. Lynch, "An Analysis of Dropouts in Selected Public Junior Colleges of Florida" (unpublished Doctoral dissertation, Pennsylvania State University, 1959).

[21]W. T. Lowe, "Factors Related to Attendance or Non-Attendance by Capable Illinois High School Graduates" (unpublished Doctoral dissertation, University of Illinois, 1961).

1953.[22] This writer rated the importance of personal and social adjustment of the students second only to intellectual development. He cited a need for an effort by faculty members to communicate to students the existence of a genuine interest in them as individuals. In this study, size of high school was not related to academic survival or academic performance ($r = .06$) at the college. The average percentile rank in high school was 73 for enrolled students and 58 for drop-outs. Median scores on the Ohio State Psychological Council Examination were 55 and 42 respectively ($P = .01$).

Cape studied characteristics of 302 drop-outs at Dillard University over a ten year period.[23] Education or occupation of parents was not significantly related to academic achievement. Forty-nine per cent of the drop-outs were doing passing work at the time of their leaving the University.

Faunce, following a study of in-term drop-outs at Michigan State University for a two year period (1947-49), concluded that there should be a closer working relationship among those personnel officers interested in the living situation, academic advisory services, student health, and professional counselors.[24] Within the college community the potential

---

[22] W. L. Slocum, "Social Factors Involved in Academic Mortality," College and University, XXXII (Fall, 1956), 53-55).

[23] W. J. Cape, "A Study of Selected Characteristics of Drop-outs at Dillard University" (unpublished Doctoral dissertation, Indiana University, 1958).

[24] L. D. Faunce, "A Study of Within-Term Dropouts at Michigan State University for the School Years 1947-49" (unpublished Doctoral dissertation, Michigan State University, 1952).

within-term drop-out failed to participate as much with others in campus organizations. Poor academic work was acknowledged by students only when some other reason was lacking.

In studying 1,547 students in the School of Education at the University of Minnesota Landskov found that 36.8 per cent dropped out during their freshman year, 13.2 per cent during the second year, 7.4 per cent during the third year, and 4.4 per cent during the fourth year.[25] The author stressed the need for careful counseling during the freshman year.

A study by Hanks at the University of Arkansas in 1954 compared several factors related to retention and withdrawal of freshmen.[26] Of the 1,902 freshman students included in this study, 595, or 31.3 per cent, failed to enroll for their second year of study. Freshman withdrawals, compared with those who remained in school, had lower scholastic aptitude as measured by the American Psychological Council Examination, poorer mastery of the English language as measured by the Cooperative English Test, and lower high school cumulative grade point average.

Munger studied 891 freshman students, from the lower third of their high school graduating classes, at the University of Toledo to determine whether a discernible pattern could

---

[25] N. L. Landskov, "Suggested Student Survival Techniques Recorded at the University of Minnesota," College and University, XXIII (June, 1948), 235-236.

[26] C. J. Hanks, "A Comparative Study of Factors Related to Retention and Withdrawal of Freshman Students at the University of Arkansas" (unpublished Doctoral dissertation, University of Arkansas, 1954).

be observed to account for the various lengths of residence of college students.[27] The biographical variables of sex, age, veteran status, and religion were only slightly, if at all, related to persistance. Significant relationships were found between the means of the persistance groups for most of the data on course work. Success in the first courses in English, history, mathematics, and social science were significantly related to persistance (P = .01). The higher the grade received for these courses, the longer the student remained in college.

Over 3,000 drop-outs at Los Angeles City College were studied by Snyder.[28] The profile of the drop-outs differed little, except in academic ability, from those of the other collegians. The most significant findings were in respect to differing academic abilities of the two groups (withdrawals and continuing). The withdrawal group consistently showed inferior ability as measured by mental and reading tests. The mean for the Thurstone Psychological Examination Scores of the withdrawal group was 151.3, in contrast to 164.9 for the college as a whole (P = .01). The mean for the withdrawal group on the Iowa Silent Reading Examination was 126.1, in contrast to 134.7 for the college as a whole (P = .01). There was no significant difference in occupational level of the parents.

---

[27] P. F. Munger, "Factors Related to Persistance in College of Students Who Were Admitted to the University of Toledo from the Lower Third of Their Respective High School Classes" (unpublished Doctoral dissertation, University of Michigan, 1954).

[28] L. Snyder, "Why D o They Leave?," Journal of Higher Education, XI (January, 1940), 26-32.

Johnson, in an analysis of drop-outs at a state college in Alabama, concluded that a high percentage of the reasons for drop-outs could be corrected by a counseling program which would assist the student in making academic, financial, personal, and social adjustments, particularly during his first semester at the college.[29] Subjects for the study were a representative sample of 1,948 students attending the college as sophomores and a like sample of freshmen who did not return after the freshman year. Subjects took the American Psychological Council Examination, the Iowa Silent Reading Test, and the California Test of Personality. Grade point averages were also computed. The only significant difference between the men who stayed and those who left was found in the grade point average, which was significant at the .01 level.

Heaton and Weedon, in discussing the failing student, stated that scores on psychological examinations indicated that mental ability as measured by such an examination is one important factor, but not the only important factor, to be considered in the prediction of academic success or failure.[30] Subjects for the study were 916 students from Albion College, Central State Teachers College, Michigan State College, and Olivet College, who took the American Council Psychological Examination. The author took the national summary of scores for four year colleges as a basis for classifying the students at

---

[29] G. B. Johnson, "A Proposed Technique for the Analysis of Dropouts at a State College," Journal of Educational Research, XLVII (January, 1954), 381-387.

[30] K. L. Heaton and V. Weedon, The Failing Student (The University of Chicago Press, 1940), p. 37.

Albion, Michigan State, and Olivet and the national summary for teachers colleges as the basis for classifying students at Central State Teachers College. The distribution for the 916 students showed that 9.7 per cent of the total were in the highest one-fourth of freshmen, 21.8 per cent were in the third fourth, 30.8 per cent were in the second fourth, and 37.8 per cent were in the lowest fourth. Approximately one-third of the failing students were above the average of all students in similar colleges on psychological scores, while two-thirds were below average. The fact that 9.7 per cent, or 89 students of the total group of failing students, scored between the 75th and 99th percentile would indicate that those of superior ability as measured by the test are not uniformly successful in academic efforts.

Crews compared 22 intellectual and non-intellectual factors with college success for 326 graduates from the School of Science at Oregon State College.[31] The best predictive factor was the high school decile. For students who had been enrolled in college one or more terms, the previous college record provided the best information available for prognosis. Selected correlations were as follows: high school decile vs. success in the College of Arts and Letters, .415, vs. over-all college success, .402; credit transferred from other colleges vs. over-all success, .692; first-term college grades vs. first year grades, .812, and vs. over-all grades, .645.

---

[31]G. T. Crews, "Selected Factors in Relation to College Success for Science Majors at Oregon State College" (unpublished Doctoral dissertation, Oregon State College, 1957).

Lunn studied the effectiveness of scholastic aptitude and other selected variables in prediction of success in the three sequential professional education courses of the teacher education program at the University of Oklahoma.[32] The greater the scholastic aptitude, the greater the achievement was likely to be in reading comprehension, English, mathematics, science, history, and grade point average for the first year of college. Social class identification, occupation of parent, and educational level of parents did not affect scholastic aptitude.

A study at Purdue University by Palcios of 264 college men and women dealt with an investigation of the validity or predictive efficiency of a battery of tests selected by the Committee on Selection and Guidance at that institution.[33] The best single predictor of future academic success was the post academic achievement as measured by the first year grade point index ($r = .532$).

Kramer's study of 2,202 students at Rutgers University dealt with students who enrolled as freshmen entering directly from New Jersey public secondary schools in 1953, 1954, 1955,

---

[32] M. S. Lunn, Jr., "The Prediction of Success of Students Enrolled in Professional Education Courses at the University of Oklahoma" (unpublished Doctoral dissertation, University of Oklahoma, 1961).

[33] J. R. Palacios, "A Validation Study of Selected Tests for Possible Use in Admission to Professional Education Sequences at Purdue University" (unpublished Doctoral dissertation, Purdue University, 1959).

and 1956.[34] The effectiveness of reported rank in class as a criterion for admission to Rutgers University was analyzed. The relationship between reported high school ranks and cumulative averages in college was computed and expressed by a correlation (r = .393). The results of this study, in contrast to some of the earlier studies, showed better predictive results could be secured if high school ranks were considered separately for each of the schools.

Giusti investigated the relative importance of curriculum experiences in high school for the prediction of academic success in the College of Education at Pennsylvania State University.[35] Six variables were studied, namely: high school index and achievement test scores in English, mathematics, history, science, and foreign language. Of the six predictive variables, the high school index was the best predictor of college grade point average. High school index correlated .47 with academic success. The combination of all high school subject fields and high school index yielded a multiple R of .484.

Waller attempted to find some factors which might be meaningful for predicting persistence at Trenton State College.[36] The sample consisted of 58 men and 199 women who persisted to graduation and 72 men and 135 women who withdrew

---

[34]G. A. Kramer, "High School Class Rank and Academic Performance in College" (unpublished Doctoral dissertation, Rutgers University, 1959).

[35]J. P. Giusti, "The Prediction of Academic Success in a College of Education Based on High School Curriculum Experiences" (unpublished Doctoral dissertation, Pennsylvania State University, 1962).

[36]C. Waller, "Predicting Persistence to Graduation at Trenton State College" (unpublished Doctoral dissertation, Columbia University, 1962).

before graduation from the entering class at Trenton State College in 1957. Data studied included: curriculum in college, high school rank, grades in college, high school personality rating, sex, father's occupation, educational level of parents, geographical location of high school, extra-curricular activities, College Entrance Examination Board scores or School and College Ability Test scores (verbal and quantitative). A stepwise regression analysis was made for fourteen factors known for 435 students of the total sample. First semester grade average was the best single predictor for persistance with a correlation of .45. High school rank was the second best predictor (r = .31). The objective data did not reveal any factors which would give a high prediction, but certain data showed a positive relationship to persistance. These were high school rank, sex, verbal and quantitative test scores, and the writing test. Socio-economic factors (particularly educational level of parents and financial resources) showed some relationship (r = .14).

In summarizing the related research studied by the author, several generalizations may be made. In every study involving high school rank it was found that this was an important criterion for prediction of academic success in college. Though some studies tended to minimize the importance of psychological test scores as being useful in predicting college success, most of the research showed them to be a reliable predictor. Many investigators made strong pleas for effective guidance, counseling, and orientation programs. There appeared

to be divided views on the importance of education and occupation of parents in the prediction of academic success. Most of the research investigating the importance of participation in extracurricular activities in both high school and college showed that drop-outs tended to participate less. It was clearly shown that the first year in college is the critical one in terms of drop-out and withdrawal patterns. The figure of 50 per cent of all university freshmen who fail to graduate from the institution of first registration was also shown to be stable. In studies which tended to isolate the reasons for students' withdrawal, a multiplicity of reasons were listed by students, but no definite pattern was apparent. Sex, age, or veteran status were not significantly related to persistence in college in any of the literature reviewed.

It is clear that much work needs to be done before the real causes of drop-outs are isolated. The need for developing a more comprehensive and dependable predictive criterion of college success becomes increasingly more important as college enrollments continue to soar and financial support of universities becomes more critical.

CHAPTER III

METHODS OF RESEARCH

This study utilizes correlational procedures and causal analysis to determine the factors related to academic success in the university physical education curriculum. Subjects for the study were 124 male students enrolled in the College of Physical Education at the Chicago Undergraduate Division of the University of Illinois from 1958 to 1962. Seventy-two of the students (mean age, 18.27 years) entered the university directly from high school; 52 students (mean age, 18.69 years) transferred to the College of Physical Education from other colleges within the university. The data obtained on the groups of students were analyzed separately.

A total of 34 variables were studied. Grade point average was used as the criterion for academic success. The grade point average was based on the 5 point scale: 5.0 = A, 4.0 = B, 3.0 = C, 2.0 = D, and 1.0 = E or failure.

Commuting time represented the amount of time students spent in minutes going to and from school. Approximately 30 per cent traveled by private automobile, while the remaining 70 per cent commuted via public transportation. There were no housing facilities for students on the campus.

Occupation of father was categorized into one of seven

areas; namely, clerical, laborer, managerial, professional, sales, service occupations, and skilled laborer on the basis of the Occupation Index.[1]

Education of father and mother was studied in terms of number of years of formal education.

Each subject took the School and College Ability Test (SCAT), which measures ability in verbal and quantitative skills.[2] SCAT yields a verbal score based on 60 items, a quantitative score based on 50 items, and a total score based on 110 items. Individual performance was interpreted by means of converted scores and percentile bands.[3]

Test scores on the Essential High School Content Battery were also used.[4] This test is a comprehensive battery of high school achievement tests covering mathematics, science, and social studies. The basic premise underlying this battery is that there is a common body of knowledge and skills which it is reasonable to expect a high school graduate to possess. The mathematics test measures broad understandings of general mathematical concepts rather than specific "course work." The science test probes the student's capacity for applying his scientific knowledge to familiar and unfamiliar situations.

---

[1]Occupation Index, Dictionary of Occupational Titles, Vol. II, Occupational Classifications, 2nd Ed., March, 1949.

[2]Educational Testing Service, College Ability Test (Princeton, N.J., 1955), p. 1.

[3]Ibid., p. 2.

[4]P. Harry and W . N. Durost, Essential High School Content Battery (World Book C ompany, New York, 1951), p. 1.

The social studies test measures the student's grasp of those concepts considered essential for the effective development of the world in which he lives. Each of the above listed tests yielded a single score. Individual performance was interpreted by means of a converted score and a percentile band.

All of the subjects took the Cooperative Reading Comprehension Tests.[5] These tests are divided into tests of expression and tests of reading comprehension which includes vocabulary, reading comprehension, reading speed, and grammar. The vocabulary test consists of 60 multiple-choice recognition items. The reading test consists of 60 items based on selected reading passages. The grammar test measures several aspects of correct English by testing grammatical usage, punctuation, capitalization, and spelling. These tests are interpreted using the Chicago Undergraduate Division norms for entering freshmen.

The subjects also completed the Bild-Dutton Academic Interest Test, which measures student interest in the areas of commerce, engineering, mathematics, chemistry, geology, biology, sociology, education, history, English, foreign language, and fine arts.[6] In this test the subject expressed his preferences for studying different phases of college subject matter or doing the work involved in various courses. The subject

---

[5]Educational Testing Service, The Cooperative Tests (Princeton, N.J., 1951), p. 3.

[6]B. Bild and E. Dutton, Academic Interest Inventory (Chicago: Publication of University of Illinois, Chicago Undergraduate Division, 1951), p. 1.

matter and activities were chosen from courses in various academic departments as cited above, with the hope that the student's preferences might help him decide upon a major field of specialization or might aid him in the selection of specific courses.

Extra-curricular activity participation was another variable studied, though it was confined to intramural sports and intercollegiate athletics.

Student's rank in high school, both in terms of sten score and percentile rank, was studied. Sten scores are standard scores with a base, or range, of ten.

Other variables included grade point average by profession of father; grade point average by high school attended index; grade point average by college from which the student transferred within the University (i.e., Commerce, Engineering, Liberal Arts and Science); and previous cumulative grade point average prior to transfer into the College of Physical Education.

The Physical Fitness Test used was the Army three-item test consisting of the 250 yard indoor shuttle run, timed sit ups (two minutes), and floor push ups.[7] These test items measure strength, muscular endurance, cardio-respiratory endurance, agility, and coordination. The same personnel administered the test to all students in the study and the same items were used in all tests. Scoring tables were used to determine

---

[7]Physical Training, Field Manual 21-20, Department of the Army Field Manual, November, 1950, chap. xvii, p. 289-304.

each man's total score in the study sample.

Several variables were quantified; namely, high school index, grade point average by college from which the student transferred, and extra-curricular participation. The technique used for determining the grade point average by high school attended was to investigate the academic record of students who had previously attended the university from the high schools attended by the students in the sample, some high schools being better than others. The student from the better high school usually tends to do better in college than one from a less good high school. Thus, if it is known that a student comes from a good high school for college attendance, it is possible to predict a higher college grade-point average for him. The relative standings of the high schools may be determined by finding out how well the student from each high school does in college. Thus, the high school is evaluated on the basis of performance of its students in college. After the high school has been evaluated on the basis of one group of students, it is possible to predict the level of achievement for the next group of students. It is the average student from a high school that will give the true picture of that high school's worth. If one takes an average of all students that come from one high school, it will be a biased sample, weighted too much on the high or low end. Thus, it is necessary to pick a sample of students from each high school that will be representative of the whole class, with an equal number from the upper and lower ends. In this study the author tried to balance the

students equidistant from the 49-1/2 percentile. If one student was at the 49th percentile, another student from the 50th percentile was chosen. A student at the 38th percentile was balanced by one from the 61st percentile. Since few students come from below the 30th percentile, the sample was drawn from students between the 30th and 70th percentiles. By averaging the grade point average for these students, the writer obtained, as accurately as possible, a picture of the "typical" student from each high school, and thus arrived at a quantitative value for that high school. The sample of entering students which was used for this quantifying process was for the years 1956 through 1958. This was not the same as the sample for this study. However, this is of minor concern since the high school values are quite constant.[8]

The grade point average by profession was quantified by finding the mean of each of the professions represented. The grade point average by college from which the student transferred was determined by computing the mean of the grade point averages of the students from each college. (There were 15 students who transferred from the College of Commerce, 14 from the College of Engineering, and 23 from the College of Liberal Arts and Science.)

The extra-curricular participation variable was quantified by coding into three categories with #1 representing

---

[8]J. W. Creaser, Predicting College Success from Equated High School Ranks: A Cross Validated Study (Chicago: Publication of the University of Illinois Chicago Undergraduate Division, 1962), 98 pp.

numeral award, #2 representing letter award, and #3 representing no participation.

The university student counseling bureau administered the School and College Ability Test, the Essential High School Content Battery, the Cooperative Reading Tests, and the Bild-Dutton Interest Inventory Test. These tests were given each semester during Freshman Week. The results of these tests in sten scores were punched on IBM cards. Commuting time and occupation of father were available on the reverse side of student class schedules. Extra-curricular participation figures were available in the departmental office. High school rank and academic averages were obtained in the college office.

A separate IBM card was made up for each of the 124 subjects, into which was punched the values for each of the 34 variables. The means, standard deviations, and correlations were completed, using an electronic computer.

Multiple R was calculated by hand, using the Jenkins technique.[9] The multiple correlation was arrived at by choosing those variables which would seemingly have the most effect on the Multiple R. This technique was adapted from Jenkins.[10]

The multiple regression equation, using beta weights, means, and standard deviations, was used as described by McNemar.[11] These computations resulted in a predictive equation.

---

[9]W. L. Jenkins, "Quick Estimation of Multiple R," Educational and Psychological Measurement, X (Summer, 1950), No. 2, 346-348.

[10]Ibid., p. 347.

[11]Q. McNemar, Psychological Statistics (New York: John Wiley and Sons, 1949), p. 182.

The fluctuations in a given series were seldom dependent upon a single factor or cause.[12]

Since the multiple correlation coefficient is subject to a positive bias, the magnitude of which depends upon the degree to which (n) approaches (N), a correction for shrinkage was made. The relative importance of the individual independent variables in a multiple correlation was determined by using the beta coefficients.[13]

The beta coefficients are comparable measures which indicate the increase in the dependent variable resulting from an increase of one standard deviation in each independent variable.[14] Once the beta coefficients are calculated, one can (1) readily compute the betas needed in the raw score form of the predicted equation, (2) determine the value of the multiple correlation coefficient and the error of estimate, and (3) ascertain the relative importance of the independent variables as predictors or, if causation can be assumed, as contributors to the variance of the dependent or criterion variable.[15]

The reader is reminded that the multiple correlation coefficient represents the maximum correlation to be expected between the dependent variable and a linearly additive combi-

---

[12]H. Arkin and R. Colton, Statistical Methods (New York: Barnes and Noble, Inc., 1961), p. 94.

[13]Q. McNemar, op. cit., p. 186.

[14]H. Arkin and R. Colton, op. cit., p. 96.

[15]Ibid., p. 97.

nation of independent variables.[16] The extent of errors of prediction is indicated by the standard error of the estimate.[17]

---

[16] Q. McNemar, op. cit., p. 178.

[17] Ibid.

CHAPTER IV

RESULTS: MULTIPLE CORRELATION AND MULTIPLE REGRESSION

The first variable chosen to be included in the multiple was the one which had the highest intercorrelation with the criterion. After this variable was selected, the variable which had a combination of the highest correlation with the criterion and the lowest positive (or highest negative) intercorrelation with the variables already included was chosen next, since it would add most to the total. Four variables for both the transfer and regular students were found to give as much predictive power as could be obtained. The variables were not the same for the two groups of students.

The correlation matrices are shown in Tables I and II. Tables III and IV show the progressive increase of R with the addition of variables. Tables V and VI present the means, standard deviations, beta weights, and present contribution of selected variables to the correlation and prediction equations.

Each variable that was chosen added considerably to the multiple with the exception of high school rank for transfer students. From the magnitude of R, it is clear that previous college work is a better measure of success in another college than any of the tests or high school measures.

TABLE I

INTERCORRELATIONS: TRANSFER STUDENTS

	Criterion (Grade Point Average)	Previous College	Previous Grade Point Average	Geology Interest	High School Rank
Previous College	.46	-	.45	.27	.33
Previous Grade Point Average	.45		-	-.13	.34
Geology Interest	.27			-	.01
High School Rank	.33				-

R = .65, δest. = .3 (grade point units)

TABLE II

INTERCORRELATIONS: REGULAR STUDENTS

	Criterion (Grade Point Average)	High School Rank	High School Attended	Fitness Test	Social Science Achievement
High School Rank	.31	-	-.16	.10	.10
High School Attended	.19		-	-.07	-.14
Fitness Test	.23			-	.25
Social Science Achievement	.29				-

R = .51, δest. = .3 (grade point units)

TABLE III

PROGRESSIVE INCREASE OF MULTIPLE R:
TRANSFER STUDENTS

Variable	Multiple R
Previous College Index	.46
Previous College Grade Point Average	.57
Geology Interest	.63
High School Rank	.65

TABLE IV

PROGRESSIVE INCREASE OF MULTIPLE R:
REGULAR STUDENTS

Variable	Multiple R
High School Rank	.31
High School Attended	.39
Fitness Test	.45
Social Science Achievement	.51

TABLE V

TRANSFER STUDENTS: MEANS, STANDARD DEVIATIONS,
AND BETA WEIGHTS

Variable	Mean	St. Dev.	Beta Wt.	Beta Wt.^{2}	% Contrib.
Grade Point Average (Criterion)	3.4	.4			
Previous College Index	3.4	.3	.26	.0676	20.98
Previous Grade Point Average	2.6	.4	.36	.1296	40.22
Geology Interest	5.8	1.2	.31	.0961	29.82
High School Rank	5.7	1.0	.17	.0289	8.98
				.3222	100.00

College Success (Grade Point Average) =
.30 + .35 (Previous College Index)
+ .36 (Previous Grade Point Average)
+ .10 (Geology Interest) + .07 (High
School Rank).

TABLE VI

REGULAR STUDENTS: MEANS, STANDARD DEVIATIONS, AND BETA WEIGHTS

Variable	Mean	St. Dev.	Beta Wt.	Beta Wt.^{2}	% Contrib.
Grade Point Average (Criterion)	3.0	.4			
High School Rank . . .	5.2	1.4	.33	.1089	42.02
High School Index . . .	2.5	.3	.27	.0729	28.12
Fitness Test Score	55.	21	.14	.0196	7.52
Social Science Achievement	4.8	1.4	.24	.0579	22.34
				.2585	100.00

College Success (Grade Point Average) = 1.080 + .096 (High School Index) + .003 (Fitness Test) + .070 (Social Science Achievement).

Since the Multiple R might be different if calculated for another sample of students, it is important to determine how much it might vary. Applying the shrinkage formula, the probable lower limit of R obtained with a new sample is .62 for transfer students and .48 for regular students.[1]

The multiple regression equation for regular students has weights of three decimal places, whereas two decimals were considered adequate with transfer students, the reason for this being the large values for the fitness test scores relative to the values of the other scores. For transfer students, the means and standard deviations of all variables were reasonably similar, and thus their weightings were not too discrepant. The fitness test score, however, was twenty times as great as the standard deviation of the high school index. The

[1]Q. McNemar, op. cit., p. 186.

small weighting it receives eliminates the score altogether (by rounding to zero), unless carried out to three decimals.

The regression equations present the prediction of grade point average to .3 grade points for the transfer and regular students. The formulas should be tested on future students and other sources of predictive variance sought.

CHAPTER V

RESULTS: CHOSEN VARIABLES

This chapter presents a discussion of the variables used in obtaining the multiple correlation. As was pointed out in Chapter IV, the variables chosen for the 72 regular students were high school rank, index of high school attended, fitness test, and social science achievement. High school rank had the highest coefficient of correlation with the criterion (.31). These results add further support to the value of rank in high school as one of the best predictors of academic success in college.

The sample of 72 students came from 41 different high schools--43 from public high schools in Chicago, 18 from parochial and private schools in Chicago, and 11 from suburban schools. The caliber of education in these schools varied considerably. For this reason the index was developed which reflected the success of the graduates of the various high schools.

The physical fitness test correlated (r) with the criterion ($r = .23$ and $r = .21$ respectively for regular and transfer students).

A comparison was made of the top twenty regular students (grade point averages) with the low twenty regular stu-

dents. The mean fitness test scores were 60.5 for the former and 59.6 for the latter. The difference was not statistically significant. However, the top twenty transfer students scored significantly higher on the fitness test than the top twenty regular students ($t = 4.45$; $P = .01$ level). The low twenty transfer students also made significantly higher scores on the fitness test than the low twenty regular students ($t = 4.45$). The top twenty transfer students also scored significantly higher on the fitness test than the low twenty transfer students ($t = 3.46$).

The problem of commuting added considerably to the length of the school day for most students (mean: regular students, 117.50 min.; transfer students, 117.69 min.). This loss of time made the school day longer and may have had implications relative to fitness.

Social science was another variable used in the combination of those variables contributing most to the Multiple R. An even higher correlation was expected because students majoring in Physical Education are for the most part socially-oriented individuals with out-going personalities. Over 90 per cent of the students in the sample had camping or scouting experiences which would tend to make them more skilled in human relationships even though they might not have had the actual social studies curriculum background.

The four variables chosen for transfer students were somewhat different than those for regular students, with the exception of high school rank. The other three variables

which contributed most to the multiple correlation were previous college index, previous grade point average, and geology interest. Correlations were highest between the criteria and previous college index (r = .46) and previous grade point average (r = .45). High school rank (r = .33) and geology interest (r = .27) followed in order.

The previous college index was quantified by determining the average grade (mean) for the students during their first semester in the College of Physical Education according to their previous college. The attrition of students who transferred to the College of Physical Education from other colleges within the university was exceptionally low. Only six students of the total of 52 were dropped for poor scholarship at the end of their first semester, a figure considerably lower than the all-university figure of 18 per cent. The reasons advanced for this low attrition rate are (1) added motivation of students in the new college, (2) prior experience in university work and thus possible better study habits and wiser utilization of time, (3) student-faculty advisory program within the College of Physical Education, and (4) extra maturity over regular students--approximately six months. The correlation of high school rank and the criterion were almost identical among regular and transfer students. The grade point average by previous college and grade point average during the semester before transfer had high correlations with the criterion (r = .46 and r = .45 respectively). This was expected because these students had already survived the

first semester of study and also because these provide a measure of previous college success in the same university.

The correlation of geology interest with the criterion ($r = .27$) is an interesting phenomenon since with the regular students the correlation was only $r = .01$. It is understandable that in the case of evaluation of interest battery information, students are most likely to express an interest in areas in which they had already been accepted or were contemplating entrance. There may be a reasonable explanation, but it is not clear from these data.

CHAPTER VI

RESULTS: OTHER VARIABLES

Many variables that the author presumed would be significant, following review of the literature at the beginning of the study, proved to be of little value. Commuting time, for example, which had a mean of 117.50 minutes for regular students and 117.69 for transfer students, correlated poorly with academic success.

Extracurricular participation (limited to intramural and intercollegiate sports competition) was negatively correlated with academic success ($r = -.10$ and $r = -.20$) for regular and transfer students respectively. This is in disagreement with most of the previous work. The explanation of this pheonomenon may be associated with the problem of commuting. The time spent in participation in sports activities when added to commuting time considerably reduces study time. The problems faced by students attending urban universities are much different from those of students who live on or adjacent to the campus, since time spent in commuting cannot be used productively.

The occupation of the father was unrelated to academic success ($r = .00$ for transfer students and $r = .09$ for regular students). The skilled laborer classification, which

dominated the study sample, represented 41 per cent of the sample of regular students and 37 per cent of the sample of transfer students. The service occupation comprised 22 per cent of the regular students sample and 14 per cent of the transfer students. Twenty-one per cent of the transfer students' fathers were in managerial positions, and seven per cent of the students in the regular group had fathers in this category. In a statistical analysis of the occupation of the fathers of regular and transfer students, it was found that a significantly greater number of the fathers of the transfer students came from the professional and managerial occupations (X^2 = 8.051, P = less than .05). The occupations were grouped for analysis into four classifications; namely, sales and service, professional and managerial, laborer and skilled laborer, and clerical.

The education of the father for both regular and transfer students correlated .09 with the criterion. Education of the mother correlated .10 for regular students and .05 for transfer students.

There were several high intercorrelations between variables for both groups of students. However, the variables were not necessarily the same for regular and transfer students. The highest in both categories were high school rank by sten score and high school rank by percentile (r = .98 for regular students and r = .97 for transfer students). These should be high because they are measures of the same thing.

Table VII presents these higher intercorrelations be-

tween variables for regular and transfer students. The differences between the correlations were tested for significance using the r to z transformation and testing with the "t" test.[1] None of the correlations were significantly different.

TABLE VII

INTERCORRELATIONS BETWEEN VARIABLES: REGULAR AND TRANSFER STUDENTS

		Regular	Transfer	t
High School Rank (sten score)	High School Rank (percentile)	.98	.97	-1.15
Verbal Learning	Soc.Sci.Achieve.	.59	.62	- .27
Verbal Learning	Vocabulary	.56	.57	-1.02
Quantitative Learning	Mathematics Achievement	.54	.68	-1.30

The twenty high and low (academically) regular and transfer students were compared on the twenty-three variables shown in Tables VIII and IX using the "t" test. Two variables in each category (regular and transfer students) were found to be significant (high school rank and fitness test score). In each instance the scores of the transfer students were significantly higher.

[1] H. M. Walker and J. Lev, Statistical Inference (New York: Holt, Rinehart and Winston, 1953), p. 254.

TABLE VIII

SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS: TOP TWENTY TRANSFER AND REGULAR STUDENTS

Variable	Mean (regular students)	Mean (transfer students)	t
High School Rank (%ile)	51.7	63.8	4.30 (.01)
Verbal Learning (sten)	5.2	5.5	.19 (NS)
Quantitative Learning	4.6	6.3	1.95 (NS)
Mathematics Achievement	4.7	6.3	1.95 (NS)
Natural Science Achievement	4.5	5.5	1.14 (NS)
Social Science Achievement	5.1	5.6	.60 (NS)
Vocabulary	5.0	5.1	.11 (NS)
Reading Comprehension	4.4	4.9	.51 (NS)
Reading Speed	4.9	5.5	.67 (NS)
Grammar	5.2	5.2	.00 (NS)
Fitness Test Score	60.5	75.2	4.45 (.01)
Commerce Interest	4.6	5.0	.42 (NS)
Engineering Interest	4.5	5.6	1.09 (NS)
Mathematics Interest	3.9	5.3	1.62 (NS)
Chemistry Interest	4.0	5.5	1.74 (NS)
Geology Interest	4.9	6.2	1.47 (NS)
Biology Interest	5.4	5.8	.44 (NS)
Sociology Interest	6.0	4.8	1.30 (NS)
Education Interest	6.7	5.2	1.74 (NS)
History Interest	5.6	4.8	.85 (NS)
English Interest	4.9	5.2	.30 (NS)
Foreign Language Interest	4.3	4.8	.62 (NS)
Fine Arts Interest	4.6	5.5	.95 (NS)

TABLE IX

SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS: LOW TWENTY TRANSFER AND REGULAR STUDENTS

Variable	Mean (regular students)	Mean (transfer students)	t
High School Rank (%ile)	32.7	44.2	4.15 (.01)
Verbal Learning	4.4	5.4	1.19 (NS)
Quantitative Learning	4.9	5.7	.88 (NS)
Mathematics Achievement	4.8	5.7	1.08 (NS)
Natural Science Achievement	4.3	5.4	1.18 (NS)
Social Science Achievement	4.8	5.0	.02 (NS)
Vocabulary	4.8	5.1	.42 (NS)
Reading Comprehension	4.6	4.9	.24 (NS)
Reading Speed	4.7	4.9	.22 (NS)
Grammar	5.1	4.5	.69 (NS)
Fitness Test Score	59.6	70.7	4.81 (.01)
Commerce Interest	4.4	6.0	1.71 (NS)
Engineering Interest	4.7	5.4	.86 (NS)
Mathematics Interest	4.1	4.9	.93 (NS)
Chemistry Interest	4.2	5.2	1.21 (NS)
Geology Interest	5.1	5.3	.10 (NS)
Biology Interest	5.3	5.0	.30 (NS)
Sociology Interest	5.8	5.6	.22 (NS)
Education Interest	6.0	5.6	.48 (NS)
History Interest	5.0	5.5	.49 (NS)
English Interest	5.0	5.6	.71 (NS)
Foreign Language Interest	4.4	4.9	.55 (NS)
Fine Arts Interest	4.5	5.2	.88 (NS)

Table X presents a comparison between the twenty high and low (grade point average) regular students. High school rank was found to be significantly higher for the high academic group.

TABLE X

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS: TOP TWENTY REGULAR AND LOW TWENTY REGULAR STUDENTS

Variable	Mean (High Regular)	Mean (Low Regular)	t
High School Rank (%ile)	51.7	32.7	2.25 (.05)
Verbal Learning	5.2	4.4	.96 (NS)
Quantitative Learning	4.6	4.9	.24 (NS)
Mathematics Achievement	4.7	4.8	.12 (NS)
Social Science Achievement	5.1	4.8	.37 (NS)
Vocabulary	5.0	4.8	.23 (NS)
Reading Comprehension	4.4	4.6	.21 (NS)
Reading Speed	4.9	4.7	.24 (NS)
Grammar	5.2	5.1	.11 (NS)
Fitness Test Score	60.5	59.6	.28 (NS)
Commerce Interest	4.6	4.4	.23 (NS)
Engineering Interest	4.5	4.7	.25 (NS)
Mathematics Interest	3.9	4.1	.22 (NS)
Chemistry Interest	4.0	4.2	.23 (NS)
Geology Interest	4.9	5.1	.22 (NS)
Biology Interest	5.4	5.3	.10 (NS)
Sociology Interest	6.0	5.8	.22 (NS)
Education Interest	6.8	6.0	.83 (NS)
History Interest	5.6	5.0	.59 (NS)
English Interest	4.9	5.0	.11 (NS)
Foreign Language Interest	4.3	4.4	.10 (NS)
Fine Arts Interest	4.6	4.5	.10 (NS)

The twenty high and low (grade point average) transger students were compared in Table XI. High school rank and fitness test scores were found to be significantly higher for the high ranking students academically.

TABLE XI

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS: TOP TWENTY TRANSFER AND LOW TWENTY TRANSFER STUDENTS

Variable	Mean (High Transfer)	Mean (Low Transfer)	t
High School Rank (%ile)	63.8	44.2	6.24 (.01)
Verbal Learning	5.5	5.4	.11 (NS)
Quantitative Learning	6.3	5.7	.66 (NS)
Mathematics Achievement	6.3	5.7	.69 (NS)
Natural Science Achievement	5.5	5.4	.11 (NS)
Social Science Achievement	5.6	5.0	.71 (NS)
Vocabulary	5.1	5.1	.00 (NS)
Reading Comprehension	4.9	4.8	.11 (NS)
Reading Speed	5.5	4.9	.68 (NS)
Grammar	5.2	4.5	.74 (NS)
Fitness Test Score	75.2	70.7	3.46 (.01)
Commerce Interest	4.2	6.0	1.33 (NS)
Engineering Interest	5.6	5.4	.23 (NS)
Mathematics Interest	5.3	4.9	.49 (NS)
Chemistry Interest	5.5	5.2	.23 (NS)
Geology Interest	6.2	5.3	1.01 (NS)
Biology Interest	5.8	5.0	.82 (NS)
Sociology Interest	4.8	5.6	.71 (NS)
Education Interest	5.2	5.6	.47 (NS)
History Interest	4.8	5.5	.75 (NS)
English Interest	5.2	5.6	.42 (NS)
Foreign Language Interest	4.8	4.9	.01 (NS)
Fine Arts Interest	5.5	5.2	.33 (NS)

The results of the "t" test of significance substantiate the importance of high school rank and fitness for both groups of students (regular and transfer). The probability of one out of twenty variables being significantly different due to chance at the .05 level is one in twenty. With four samples, the one that would be significant would normally be different for each sample. The fact that the variables were

the same (high school rank and fitness test score) in each case could hardly be due to sampling.

CHAPTER VII

LOOKING AT STUDENT WITHDRAWALS

The original study began with a total of 177 students. However, during the course of the four-year period (1958-1962) there were many students who withdrew before completing one semester. The reasons advanced by these students for leaving school were many and varied, as is the case in any withdrawal situation. W. P. Pillsbury, Dean of Students at Knox College in Illinois, stated in an address to that student body that parents, students, and educators are falling down somewhere when half of our high school seniors in this country who demonstrate their ambitions for higher education by enrolling in colleges change their minds in midstream or become discouraged or submit to outside attractions, and fail to finish the college training which they so hopefully began as freshmen.[1] It is obvious that college withdrawals cannot be completed eliminated, but the author--like many others in education--believes that they can be reduced.

In a nation-wide survey by the United States Department of Health, Education and welfare, slightly less than 40 per cent of the freshman class remained at the institution of

---

[1]W. P. Pillsbury, "Address to Knox College Students," Chicago Tribune, July 12, 1962.

first enrollment to graduate four years later.[2] Further data from this study revealed the great majority of reasons given for withdrawal referred to personal problems and deficiencies rather than to deficiencies in the facilities of the institution.[3] This indicated the importance of greater attention to services which can assist in solving these problems. This study, which included a sample of 13,700 men and women, also revealed some interesting figures on retention of interest in subject-fields of interest.[4] Men whose initial interests were in subject-fields of engineering, physical education, business administration, and agriculture were least likely to change to other subject-fields, and more changes were to related fields than to unrelated fields.[5] Student reports of reasons for going to college, interests in subject-fields, and financial reasons, plus institutional reports of student standing in high school graduating class and on college placement tests, showed that many students enrolled in institutions of higher education in which the prospects of completing their programs of study were poor.[6] A majority of students who discontinued their higher educational programs attributed their withdrawal to factors identified with themselves rather than with the institutions they attended.[7]

---

[2]United States Office of Education Bulletin, op. cit., p. 100.

[3]Ibid., p. 106.

[4]Ibid., p. 104.

[5]Ibid., p. 104.

[6]Ibid., p. 109.

[7]Ibid., p. 109.

A questionnaire survey was conducted at the University of Illinois, Chicago, among 184 men students who withdrew from the university between April 15, 1961 and June 1, 1962 (all colleges). The questionnaire used was one-half page in length, requiring short answers and no signature. Only six of the total respondents listed lack of teacher help as the reason for withdrawal. Table XII presents a summary of their reasons for withdrawal and the number of students in each category.

TABLE XII

REASONS WHY STUDENTS WITHDRAW

Personal	59
Illness	36
Failing academically	26
Poor study habits	20
Poor college choice	18
Military service	12
Transferring to another college	7
Lack of teacher help	6
Total	184

This survey substantiated the findings of the United States Department of Health, Education, and Welfare cited above. It should also alert all those persons who work directly or indirectly with students to the many problems faced by the college student. The withdrawal problem is a myriad one and needs to be continually studied and evaluated in the light of all information that is available.

Table XIII presents a comparison of 22 variables between 22 regular students who withdrew and 72 students who remained in school.

TABLE XIII

SIGNIFICANCE OF VARIABLES BETWEEN REGULAR STUDENTS WHO WITHDREW AND REGULAR STUDENTS WHO REMAINED IN SCHOOL

Variable	Mean for Regular Students who Withdrew	Mean for Regular Students who Remained in School	Difference	Probability
High School Rank (sten score)	4.38	5.19	.81	.05
Extra-curricular Participation	2.90	2.54	.36	.001
Occupation of Father	4.90	5.94	1.04	NS
Education of Father	10.33	10.75	.42	NS
Education of Mother	10.71	11.14	.43	NS
Verbal Learning	3.95	4.79	.84	.05
Quantitative Learning	4.04	4.88	.83	NS
Mathematics Achievement	3.85	4.78	.92	.05
Natural Science Achievement	3.38	4.39	1.00	NS
Social Science Achievement	4.04	4.82	.78	NS
Vocabulary	4.09	5.07	.98	.05
Reading Comprehension	3.76	4.72	.96	NS
Reading Speed	4.61	5.01	.40	NS
Grammar	3.76	4.92	1.16	.05
Grade Point Average by Profession	3.08	3.05	.03	NS
Grade Point Average by High School	2.61	2.52	.11	NS
Commuting Time	98.57	117.50	18.93	.01
Commerce Interest	5.19	4.69	.50	NS
Engineering Interest	4.00	4.04	.04	NS
Mathematics Interest	3.14	4.08	.94	.05
Chemistry Interest	4.04	4.22	.18	NS
Geology Interest	4.33	4.98	.63	NS
Biology Interest	5.14	5.18	.04	NS
Sociology Interest	5.80	5.70	.10	NS
Education Interest	7.00	6.25	.75	.05
History Interest	5.82	5.70	.12	NS
English Interest	4.85	5.10	.25	NS
Foreign Language Interest	4.57	4.44	.13	NS
Fine Arts Interest	4.76	4.51	.25	NS

The one variable of the twenty-eight studied that was significant at the .001 level (extracurricular participation) indicated that students who participate in intercollegiate and intramural sports are more likely to stay in school. These data were coded so that the lower value indicates greater participation. The students who withdrew might have been more likely to remain, however, if there had been some group or team attachment with the accompanying motivation that is generally present. The socialization process that occurs in extracurricular activities has a "holding power" for many students and, despite the fact that students at this age are more selective of their groups and idols, the urge to join and be a member of a group is still strong in most instances.

The variables significant at the .05 level, namely, high school rank, verbal learning, mathematics, vocabulary, and grammar, are inter-related with the academic process and are in the expected direction.

There was a considerable difference in commuting time for students who withdrew and regular students who completed the semester in favor of the withdrawing students. That is, withdrawing students spent an average of 18.93 minutes less in commuting time than the regular students. This was in the opposite direction than had been expected.

The two variables significant in the interest inventory category were mathematics and education. The mathematics differences were in favor of the regular student. The education category of the interest inventory was significantly in

favor of the withdrawing student even though they did withdraw. It is a paradox that they reflected significantly greater educational interest. This sheds little light on their withdrawal, but rather intensifies the interest as to the real reasons why they withdrew. Mathematics achievement was also statistically significant.

The findings in this section of the study strengthen the premise that high school rank is an important criterion in predicting academic success for students who withdrew as was the case for regular and transfer students in other sections of the study. A follow-up of the present disposition of all students in the study which appears in Tables XIV and XV supports the findings of the study of the United States Office of Education that 60 per cent are still in school or graduated and 40 per cent are no longer in school.[8]

TABLE XIV

DISPOSITION OF SEVENTY-TWO REGULAR STUDENTS

Present Status	No. of Students	% of Total
Graduated from a Four Year School	7	.09
Still in School	37	.52
No Longer in School	28	.39

[8]Office of Education, op. cit., p. 99.

TABLE XV

DISPOSITION OF FIFTY-TWO TRANSFER STUDENTS

Present Status	No. of Students	% of Total
Graduated from a Four Year School	3	.04
Still in School	28	.54
No Longer in School	21	.42

CHAPTER VIII

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Findings

This study of 124 male students majoring in physical education over a four year period (1958-1962) has shown the predictive value of several variables as they relate to academic success. The four variables resulting in a Multiple R of .62 for transfer students were previous college index, previous college grade point average, geology interest, and high school rank. The four variables with the highest Multiple R for regular students were high school rank, high school attendance index, fitness test score, and social science achievement. The Multiple R for these variables was .48. The shrinkage formula was applied to all computations. A prediction equation was derived from the multiple regression analysis. Despite the fact that students in the sample came from over 40 different high schools--both public and private--and represented many different socio-economic backgrounds, high school rank was a reliable criterion in predicting academic success. This variable was important in the study samples of both regular and transfer students.

The high correlations between variables other than the criterion followed a logical pattern. Some of the high

correlations were verbal learning with social science achievement, verbal learning with vocabulary, and quantitative learning with mathematics achievement. The pattern of high correlations between variables other than the criterion were much the same for both regular and transfer students with the exception of education of mother and father, which had an r = .72 for transfer students.

The importance of physical fitness was illustrated by the inclusion of this variable in the Multiple R for regular students and the level of significance (.01) between the means of test scores for both regular and transfer students.

Extracurricular participation correlated negatively with the criterion for both groups of students. When regular students who remained in school were compared with students who withdrew, the regular students was found to be significantly more active in extracurricular activities (P = .001).

Commuting time was negatively correlated with academic success for transfer students.

Statistical analysis revealed that there was a significant difference between the occupation of the father in the two groups of students (regular and transfer).

Students who transfer to the College of Physical Education from other colleges within the university tend to do well academically with a correspondingly low attrition rate.

Students who withdrew from the College of Physical Education, when compared with regular students who remained in school, tended to rank lower in their high school graduating

class, participated less in intramural and intercollegiate sports, made lower scores on verbal learning tests (School and College Ability Test), made lower scores on mathematics achievement tests (Iowa High School Content Battery), made lower scores on vocabulary and grammar tests (Cooperative Reading Comprehension Test), and made lower scores on mathematics interest tests (Bild-Dutton Interest Inventory Test). Students who withdrew tended to spend less time in commuting and had higher scores on the education inventory test (Bild-Dutton Inventory Test) than regular students who remained in school.

Forty-eight (61 per cent) of the sample of 72 regular students were in school or had graduated from a four-year institution at the conclusion of the study. Thirty-one of the 52 transfer students (68 per cent) had graduated from a four-year institution or were still in school at the completion of the 1961-62 academic year.

Conclusions

1. High school rank is a valuable criterion in predicting college success despite the fact that there may be an appreciable difference in the level of academic programs of high schools from which the students graduate.
2. A formal testing program does not provide ready or complete answers in predicting college success. It is useful in making a contribution to the total situation rather than to a specific case.

3. Male students who transfer to the College of Physical Education from other colleges within the University of Illinois (Chicago) tend to do well academically provided they have done satisfactory work prior to enrollment in the new college.
4. Transfer students have significantly higher scores on the physical fitness test and rank higher in their high school graduating class than regular students.
5. Students who withdraw from the College of Physical Education at the University of Illinois (Chicago) have significantly lower test scores on verbal learning, mathematics achievement, vocabulary, grammar, and mathematics interest tests than regular students who remain in school. Withdrawing students also tended to spend less time in commuting and less time participating in intramural and intercollegiate sports when compared with regular students who remained in school.
6. The time available for sports participation by the student attending an urban university is somewhat reduced by the commuting situation.

Recommendations

1. There is an acute and immediate need for further predictive criteria for use in the selection of professional students in the College of Physical Education at the University of Illinois (Chicago).
2. The search should be continued for other variables besides those used in this study for use in the selection process.

3. Because the first year of college is the most critical drop-out period, every effort should be made to provide counseling and advisory services, particularly by the college, to the first-year student. Faculty members should arrange not only to be available for student consultation, but should be interested enough in every student with whom he comes in contact to make a contribution to the student's total educational experience.
4. Because of the apparent effect of physical fitness on academic success, it is recommended that physical fitness activities should be included to a greater extent in the course content of the professional program in physical education. Those activities which best contribute to the components of physical fitness (endurance, strength, power, agility, and coordination) should be emphasized in all physical education courses.
5. It is further recommended that a physical fitness test be given to all incoming students into the professional physical education program prior to or shortly after registration and that these test scores be used constructively by faculty members in the college.
6. The present advisory program in the College of Physical Education at the University of Illinois (Chicago) in which each staff member serves as an advisor should be continued.

BIBLIOGRAPHY

A. BOOKS

American Association for Health, Physical Education and Recreation. Research Methods Applied to Health, Physical Education and Recreation. 1st ed., 1949.

Arkin, A., and R. Colton. Statistical Methods. New York: Barnes and Noble, Inc., 1961.

Campbell, W. A Form Book for Thesis Writing. Boston: Houghton Mifflin Co., 1939.

Edwards, A. L. Statistical Methods for the Behavioral Sciences. New York: Rinehart and Co., 1954.

_____. Statistical Analysis. New York: Rinehart and Co., 1954.

Freyer, H. C. Elements of Statistics. New York: John Wiley and Sons, Inc., 1954.

Good, C. V., A. S. Barr, and D. C. Scates. The Methodology of Educational Research. New York: D. Appleton-Century Co., 1935.

Heaton, K. L., and V. Weedon. The Failing Student. Chicago, Ill.: The University of Chicago Press, 1940.

McNemar, Q. Psychological Statistics. New York: John Wiley and Sons, 1949.

Occupation Index. Dictionary of Occupational Titles, Vol. II, Occupational Classifications. 2nd ed. Washington, D.C.: Government Printing Office, 1949.

Physical Training, Field Manual 21-20. Department of the Army Field Manual. November, 1950.

Walker, H. M., and J. Lev. Statistical Inference. New York: Holt, Rinehart and Winston, 1953.

Yates, F., and R. Fisher. Statistical Tables. London: Oliver and Boyd, 1949.

B. PERIODICAL LITERATURE

Cumings, E. C. "Causes of Student Withdrawals at DePauw University," School and Society, LXX (S eptember 3, 1949), 152-153.

Fullmer, D. W. "Success and Perseverance of College Students," Journal of Higher Education, XXVII (November, 1956), 445-447.

Fults, R. S., and S. E . Taylor. "Staying Power of College Students," National Association of Secondary Schools Principals' Bulletin, XLIII (October, 1959), 109-114.

Iffert, R. "The Student Retention and Withdrawal Study," College and University, XXX (July, 1955), 406-411.

Jenkins, W. L. "Quick Estimate of Multiple R," Educational Psychology Measurement, X (Summer, 1950), 2.

Johnson, G. B., Jr. "A Proposed Technique for the Analysis of Dropouts at a State College," Journal of Educational Research, XLVII (January, 1954), 381-387.

Koelsche, C. L. "A Study of the Student Drop-out Problem at Indiana University," Journal of Educational Research, XLIX (January, 1956), 357-464.

Landskov, N. L. "Suggested Student Survival Techniques Recorded at the University of Minnesota," College and University, XXIII (June, 1948), 235-236.

Linns, L. J., and H. Pitt. "Staying Power and Rate of Progress of University of Wisconsin Freshmen," College and University, XXIX (October, 1953), 98.

Nardelli, W. "An Analysis of Drop-Outs of Freshmen," Junior College Journal, XXIX (February, 1959), 322.

Quarles, B. "Student Separations from School," Association of American Colleges Bulletin, XXXV (October, 1949), 408.

Shuman, R. B. "College Dropouts: An Overview," Journal of Educational Psychology, XXIX (August, 1956), 347-350.

Slocum, W. L. "Social Factors Involved in Academic Mortality," College and University, XXXII (September, 1956), 53-54.

Snyder, L. "Why Do They Leave?," Journal of Higher Education, XI (1940), 26-32.

Tesseneer, R. A., and L. M. Tesseneer. "Review of the Literature on School Dropouts," National Association of Secondary School Principals Bulletin, XLII (May, 1958), 141-153.

United States Office of Education Bulletin. "Retention and Withdrawal of College Students," XV (1958), 1 - 109.

Yoshimo, R. "College Dropouts at End of Freshman Year," Journal of Educational Sociology, XXXII (September, 1958), 242.

C. UNPUBLISHED MATERIALS

Cape, W. J. "A Study of Selected Characteristics of the Dropouts at Dillard University." Unpublished Doctor of Education dissertation, Indiana University, 1958.

Crews, G. T. "Selected Factors in Relation to College Success for Science Majors at Oregon State College." Unpublished Doctor of Education dissertation, Oregon State College, 1957.

Faunce, L. D. "A Study of Within-Term Dropouts at Michigan State University for the School Years, 1947-49." Unpublished Doctor of Education dissertation, Michigan State University, 1952.

Fenelon, W . J. "A Study of the Secondary School Dropout Pattern at Port Washington, Wisconsin High School." Unpublished Doctor of Education dissertation, Northwestern University, 1960.

Giusti, J. P. "The Prediction of Academic Success in a College of Education Based on High School Curriculum Experience." Unpublished Doctor of Education dissertation, Pennsylvania State University, 1962.

Hanks, C. J. "A Comparative Study of Factors Related to Retention and Withdrawal of Freshman Students at the University of Arkansas." Unpublished Doctor of Education dissertation, University of Arkansas, 1954.

Kramer, G. A. "High School Class Rank and Academic Performance in College." Unpublished Doctor of Education dissertation, Rutgers University, 1959.

Lowe, W. T. "Factors Related to Attendance or Non-Attendance by Capable Illinois High School Graduates." Unpublished Doctor of Education dissertation, University of Illinois, 1961.

Lunn, M. S. "The Prediction of Success of Students Enrolled in Professional Education Courses at the University of Oklahoma." Unpublished Doctor of Education dissertation, University of Oklahoma, 1961.

Lynch, D. F. "An Analysis of Dropouts in Selected Public Junior Colleges of Florida." Unpublished Doctor of Education dissertation, Pennsylvania State University, 1959.

Marsh, R. E., Jr. "An Analysis of Failure among University Freshmen." Unpublished Doctor of Education dissertation, Boston University, 1959.

Metzger, S. M. "A Study of Selected Characteristics of the Male Graduates and Scholastic Dropouts of the 1951 Freshman Class Entering the State University of New York Teachers College at Cortland." Unpublished Doctor of Education dissertation, New York University, 1959.

Mowers, G. E. "Self-Judgments and Objective Measures as Related to First Semester Academic Achievement of Non-Selected College Students." Unpublished Doctor of Education dissertation, Pennsylvania State University, 1959.

Munger, P. F. "Factors Related to Persistence in College of Students Who were Admitted to the University of Toledo from the Lower Third of Their Respective High School Classes." Unpublished Doctor of Philosophy dissertation, University of Michigan, 1954.

Palacios, J. R. "A Validation Study of Selected Tests for Possible Use in Admission to Professional Education Sequences at Purdue University." Unpublished Doctor of Education dissertation, Purdue University, 1959.

Patton, B. K. "A Study of Dropouts from the Junior Division of Louisiana State University." Unpublished Doctor of Philosophy dissertation, Louisiana State University, 1958.

Rogers, L. L. "Problem Analysis Study of Selected Freshmen Students at Appalacian State Teachers College." Unpublished Doctor of Education dissertation, University of Tennessee, 1959.

Russell, J. W. "A Comparison of Michigan State College First Term Dropouts and Non-Dropouts According to Certain Factors." Unpublished Doctor of Philosophy dissertation, Michigan State College, 1952.

Waller, C. "Predicting Persistence to Graduation at Trenton State College." Unpublished Doctor of Education dissertation, Columbia University, 1962.

D. NEWSPAPERS

Chicago Tribune, July 12, 1962.

E. PARTS OF SERIES

Bild, B., and E. Dutton. Academic Interest Inventory. Chicago: Publication of the University of Illinois, Chicago Undergraduate Division, 1951, p. 1.

Creaser, J. W. Predicting College Success from Equated High School Ranks: A Cross Validated Study. Chicago: University of Illinois, Chicago Undergraduate Division Publication, Student Counseling Service, February, 1962.

Educational Testing Service. College Ability Test. Princeton, N.J.: 1955, p. 1.

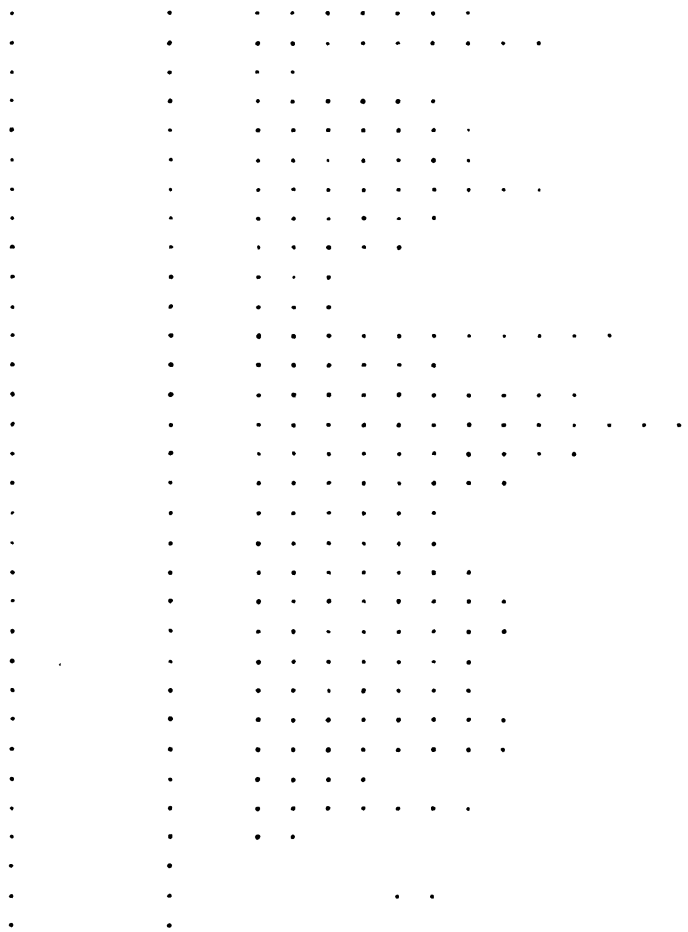
_____. The Cooperative Tests. Princeton, N.J., 1951, p. 3.

Harry, P., and W. N. Durost. Essential High School Content Battery. New York: World Book Company, 1951, p. 1.

APPENDIX

MEANS AND STANDARD DEVIATIONS: REGULAR STUDENTS

Variable	Mean	Standard Deviation
Grade Point Average	2.98	.36
Commuting time	117.50	31.17
Extracurricular participation	2.54	.51
Occupation of father	5.94	2.14
Education of father	10.75	2.38
Education of mother	11.14	1.96
Verbal Learning	4.94	1.56
Quantitative learning	4.88	1.56
Mathematics achievement	4.78	1.42
Natural Science achievement	4.39	1.46
Social Science achievement	4.82	1.44
Vocabulary	5.07	1.45
Reading comprehension	4.72	1.38
Reading speed	5.01	1.67
Grammar	4.92	1.63
Fitness test	55.22	21.38
Commerce interest	4.69	1.43
Engineering interest	4.64	1.19
Mathematics interest	4.08	1.45
Chemistry interest	4.22	1.32
Geology interest	4.96	1.73
Biology interest	5.18	1.61
Sociology interest	5.71	1.56
Education interest	6.25	1.55
History interest	5.31	1.75
English interest	5.10	1.51
Foreign language interest	4.44	1.61
Fine Arts interest	4.51	1.49
High School Rank (Sten score)	5.19	1.40
Grade Point Average (profession)	3.04	1.14
Grade Point Average (H.S. index)	2.51	.27
High School Rank (percentile)	.44	.20



MEANS AND STANDARD DEVIATIONS: TRANSFER STUDENTS

Variable	Mean	Standard Deviation
Grade Point Average	3.35	.40
Commuting time	117.69	27.33
Extracurricular participation	2.25	.47
Occupation of father	5.54	1.79
Education of father	10.98	2.19
Education of mother	11.09	1.89
Verbal learning	5.33	1.28
Quantitative learning	5.81	1.52
Mathematics achievement	5.96	1.21
Natural Science achievement	5.52	1.05
Social Science achievement	5.31	1.13
Vocabulary	5.21	1.18
Reading comprehension	4.90	1.19
Reading speed	5.15	1.34
Grammar	4.96	1.33
Fitness test	55.44	22.65
Commerce interest	5.17	1.52
Engineering interest	5.37	1.11
Mathematics interest	4.94	1.20
Chemistry interest	5.19	1.28
Geology interest	5.81	1.18
Biology interest	5.38	1.46
Sociology interest	5.19	1.18
Education interest	5.27	1.16
History interest	5.23	1.45
English interest	5.33	1.57
Foreign language interest	4.56	1.29
Fine Arts interest	5.15	1.35
High School Rank (Sten score)	5.69	1.03
Grade Point Average (profession)	3.11	1.16
Grade Point Average (H.S. index)	2.50	.20
Grade Point Average (by college)	3.39	.20
Grade Point Average (by previous college)	2.64	.38
High School Rank (percentile)	.54	.17

RAW DATA - REGULAR STUDENTS

I.D.#	GPA	CT XP OPE REM V Q M SC SS VRB RSOR FIC EQ M CH O RBUS ORD HIL FLRA HS R GPA PRO GPA HS	HSR %
094224	319	0900306141206050706030606050600050303040307070702050306052953100000000	36
075089	325	1200307121204050604020304060500030407050904030404040504073112400000000	70
093616	319	0800308081205080702050606050667050503050704030804010305063072300000000	57
077498	263	1600308121201010505040304040500030505050605020404030604043072600000000	27
076221	191	1200306121204030102020305040353060404020305050706060505062952200000000	56
092333	268	1200308081203050604030503050689050505040102050704060506073072300000000	74
080592	294	1200301121205060506060405020500030508050402050208050305062922700000000	53
081469	282	0300308081205040405060406050465040403030306050508050704053072300000000	49
080627	325	1200307081205060404040406050785040403040607050805010105053112700000000	42
097149	267	1200308080803070504040304020332030708050306060607050505043072400000000	22
097450	300	0900308101607040405050805040838070706080602040206040704063073200000000	55
081946	275	1200308121203060604040403070662030404040508060602020506033072300000000	12
075988	335	0400208111104030302020401040366050402030603090704030506073073000000000	72
081483	344	0300307040404040202050403020486020403040506070505060304063112300000000	61
090734	268	1600208081206060507060705050543060503030602040706050105053072300000000	34
089696	247	0900307121308070506050705030756050203030404080605060408043112500000000	29
075991	308	0300202131005040502060205050558060203030304080706060306042732500000000	27
095479	301	1200207121201040203020203020167020503050708030405040506043112800000000	30
088614	327	1200202101204020303030403070350090405030408060807070506052732300000000	36
082730	341	1500208121106050302040404050500060805080806040405030503063072300000000	52
086881	320	0800203070904020303040504040660404030407070407070707070333327000000000	07
077284	140	0900208111102020202010402010200060606050405050505050605033072300000000	23
080170	270	0800307101203070605040304050760020305040407060401050607043113200000000	22
075105	281	1200305101203040507050604040578050607040805060406050705043292300000000	27
092680	218	1200107050407060604080706060574020302030804050708070504043112300000000	22
077798	358	1000308141208060508060706060552070401030306050909090603043073100000000	29
096766	364	1200306101304040504050606070675080405020306090908050603062952600000000	56
097127	337	1200303141205040505080708070650060507030605070606050405063333000000000	56
075132	266	1200207121205040506050405060628020804070607020105030503053112700000000	36
074180	273	0900308101203040303060902040562080403030704060706050201043072300000000	27
083790	299	1200306121203030303020404010574060304020205060906060302052952800000000	46
089390	324	1200207141207050707080806080779040301040606060809080704063112600000000	60
090367	342	1000208001306070504050505040875030503040605060705040106063073200000000	51
092403	302	1400308121204070604070503060559040504050202030709090303063072300000000	66
091340	293	0600307081006040303030605040255060805040203080608070406023112300000000	04
081101	342	1800208121405050605070503020580040704060705050803030608053072300000000	32
075131	282	1200301121303020101030305060542060402040304070609060204032922300000000	14
082198	314	0900208121206030505050606050200050703030703070506050105033072700000000	13
074638	371	1200207100604040507040301070165010404050608070406020303053112300000000	32
094437	385	1500308141209030506080807070759070402020501060607090502083072300000000	90
096524	325	2100303101207090707060703020867050304060508080703060607083332300000000	90
073830	333	1500208151401010705040506060580020607040308040704020203063072700000000	57
083593	297	1200308080805070606050405030653050307060206040503040403063072700000000	65
090988	322	1000302161207080807060605040756040505070704020304050205082732400000000	89
075855	257	1200308131506050606040407070657040502050408090602050303013072700000000	02
087297	300	1500106081205080804050605070979050506030807080605040603062952300000000	56
074515	352	1800203141305030504050402040658060302030305050806060305033333100000000	12
079797	315	0900208101005040505060505090400040404030304060705060603083072300000000	90
095482	196	1500301121206060402030504030356060507050806050704060704062922300000000	52
088773	329	0900205131209040407090708070466070403040506090809080501043292300000000	26
082995	303	1200206101207070707060808080773030606080705020206070903052952100000000	31
086283	313	1800208101203040404030403040278040402060808060903060505063072000000000	62
079604	291	1800307130904060506050606030176050505050709040702030105043112500000000	23
089169	256	1200301101003040402060606070673050505020406070707070309042922700000000	26
085794	249	1000308080805050404020504050400030605070709070901050105063072700000000	58
079837	259	0900301141204060703050505060600050504030705050502030403042922000000000	29
075476	291	1200208081004030101030405040157030303040306070805030405023072300000000	04
095714	247	1200303101005050603050606070787205040102030607070406070406333230000000	52
082837	340	1800308081004050302040302010470030606050104040603040306093072300000000	94
094162	232	1500307121204060403030404040454060405050607070707050504053113000000000	32
076921	316	0900302101201010406050803060455030702040405050705060303052733200000000	40
076089	301	0600307080801040304040306090372060303030604070705060500093112300000000	93
087316	326	0900307191604050404060304040256040404040206060707070608063112300000000	52
093491	314	1400106121209080805080909090774070305010604080807060303062952700000000	58
088133	314	1200301111109050904050407060606770604020306040809050708070929223000000	93
093493	340	1500206121206070705060606080855506040402020205070705050606295260000000	53
076322	319	1800208100804050406050403030562020504050906030405020603063072500000000	57
080086	283	1200302120803060304080204030775050402050504090801030204052732100000000	41
081890	317	0900201120506050503060505070476030303050405060405060603052922300000000	43
096912	288	1500301080806030504060505060370060707080503040805040304062922400000000	55
089280	314	1200205121204050504040405030357706070404040505060406080703307320000000	14
090846	266	1600108141307060805070707070652060404040201060509060404043072300000000	26

RAW DATA - TRANSFER STUDENTS

I.D.#	GPA	CT	XP	OP	EF	EM	V	Q	M	SC	SS	V	RB	RS	G	F	CO	EG	M	CH	G	BI	SO	ED	H	EL	FL	FA	HSGP R	HSGP PR	GP HS	GP CO	PR GP	HR %
081612	420	060	03	06	12	12	07	07	07	08	05	06	06	05	08	62	06	06	05	06	07	07	09	06	04	06	01	04	06	295	280	360	352	68
087864	338	140	02	08	13	12	05	05	06	05	07	06	03	02	05	49	07	07	05	05	08	07	06	04	07	04	06	02	05	307	230	360	181	46
072526	363	150	02	03	08	10	04	06	03	07	06	04	03	04	03	00	04	06	05	05	07	03	04	03	03	04	00	08	07	333	280	347	266	69
080969	300	120	03	08	12	12	07	06	05	07	06	06	06	05	07	56	01	05	05	07	03	03	06	07	05	06	04	06	04	307	240	298	217	30
089410	346	090	01	07	12	12	04	06	04	04	05	04	04	05	03	47	02	04	03	04	07	04	05	06	05	06	04	08	06	311	230	347	200	51
070022	364	120	02	07	12	12	04	05	05	05	05	04	06	07	04	00	07	06	05	02	09	05	05	05	05	01	03	02	06	311	230	298	288	56
085708	340	080	03	03	12	14	05	05	07	05	05	05	06	06	03	53	05	04	06	07	07	03	04	07	07	05	02	05	05	333	270	347	283	44
077686	357	120	02	08	12	12	05	01	04	05	06	04	04	06	05	70	04	08	04	06	07	05	06	05	04	05	05	08	02	307	240	347	283	03
076497	357	100	01	01	13	12	06	04	06	04	05	05	07	09	04	87	05	08	05	05	06	06	06	07	05	04	05	04	06	292	230	360	262	52
092560	314	150	03	08	12	12	07	06	06	04	04	05	05	04	07	83	08	05	05	03	04	03	06	08	06	08	06	07	07	307	230	298	292	72
080642	346	120	01	08	08	08	05	04	03	07	06	05	06	09	06	77	05	05	01	04	06	05	06	06	05	04	04	04	05	307	270	298	234	39
083817	380	040	03	08	11	11	03	09	07	05	05	03	05	05	08	56	08	08	08	06	07	04	02	04	05	05	04	08	05	311	320	347	280	38
083557	326	120	02	03	12	11	05	[illegible]	[illegible]	06	05	06	05	05	06	00	05	05	08	04	04	05	05	05	01	01	03	07	07	333	310	347	350	82
086834	293	120	02	02	10	12	02	04	05	03	03	01	03	07	03	78	06	07	04	06	09	07	05	05	04	03	05	06	04	273	230	298	200	26
090154	380	180	01	05	18	12	05	04	04	05	04	05	02	03	01	43	02	05	08	07	04	08	05	03	07	06	04	05	04	329	290	360	300	24
080655	250	080	02	03	00	00	06	05	03	08	08	05	05	04	02	00	04	08	06	08	04	07	07	05	03	04	05	05	06	333	230	360	280	68
076667	407	090	03	08	08	08	03	05	05	03	04	05	01	05	06	58	04	05	05	05	02	07	06	09	05	07	07	07	08	307	230	360	247	91
081566	308	120	02	08	05	08	07	08	06	07	07	06	05	06	06	72	05	07	06	08	08	07	04	03	06	04	03	02	04	307	270	347	190	16
074093	314	180	03	05	14	16	04	05	05	04	05	03	03	05	04	40	08	03	05	02	04	02	05	05	08	06	06	03	05	329	230	298	284	40
088212	341	120	03	01	12	08	07	08	06	05	07	08	07	05	07	60	04	05	05	06	05	05	05	06	08	08	05	04	06	292	230	360	320	56
086017	350	120	03	08	08	12	04	04	04	04	08	02	05	06	04	84	06	04	01	03	05	04	07	08	09	09	08	04	05	307	280	360	267	59
080641	228	240	03	06	12	12	05	04	05	07	06	04	05	07	02	00	05	06	02	06	07	05	06	05	05	08	05	06	04	295	230	298	120	18
094664	314	180	02	08	10	12	06	05	04	07	04	06	06	06	02	65	07	06	05	04	05	05	06	07	06	05	04	05	05	307	230	298	258	40
083544	305	090	03	08	10	12	06	08	07	06	05	06	02	02	03	00	07	05	06	03	05	01	06	06	07	07	05	07	05	307	250	305	313	45
080974	290	100	01	07	16	12	04	03	04	04	01	03	02	02	03	97	08	07	05	07	05	06	05	05	04	03	04	07	04	311	290	360	158	25
090312	370	120	02	02	12	12	04	03	06	03	06	04	02	03	04	89	02	06	08	07	05	06	04	03	02	06	04	02	07	273	230	347	223	83
085616	240	120	02	03	12	12	05	06	07	07	06	06	05	03	04	76	04	07	06	06	04	06	02	04	00	02	04	07	06	333	240	347	250	57
096127	330	090	02	08	12	12	05	05	05	05	05	03	02	01	04	50	04	04	04	07	07	07	05	01	05	02	05	02	08	307	250	360	283	88
082619	464	160	02	03	13	12	08	08	09	07	06	08	08	08	06	71	02	01	05	05	07	09	04	03	02	03	07	05	06	333	230	360	314	66
080892	350	120	01	01	05	05	04	04	03	06	04	04	04	05	06	77	05	06	03	06	08	08	06	02	08	05	04	05	05	307	230	360	193	40
082452	235	180	03	06	10	12	08	06	07	08	05	07	06	06	06	62	05	03	04	05	06	04	09	08	07	07	06	03	05	295	230	298	278	42
075521	400	120	03	08	06	12	08	09	08	05	07	07	07	06	07	95	02	07	06	06	06	05	04	06	05	09	02	07	09	307	230	347	250	98
072757	350	180	02	07	05	05	07	07	07	05	08	07	06	07	07	00	08	02	04	01	06	03	05	05	08	06	05	02	05	311	230	298	285	38
085795	400	120	02	08	10	14	05	08	05	07	06	06	07	08	07	73	03	05	07	09	08	08	07	04	01	03	06	05	09	307	240	360	300	94
088198	357	120	02	03	12	12	07	07	07	05	06	06	05	04	05	82	07	05	04	04	08	04	05	07	08	07	05	06	07	333	230	360	240	83
083434	390	120	02	07	12	12	05	08	08	04	04	06	04	03	06	79	05	06	05	03	05	03	04	05	06	06	01	06	08	311	270	347	320	88
072132	300	090	02	07	12	08	03	03	05	06	03	04	04	03	03	78	05	05	05	02	04	02	03	05	06	07	06	05	04	311	320	360	268	28
076295	316	080	02	08	13	12	04	09	08	05	04	07	06	05	05	00	05	05	07	04	06	04	05	04	05	06	02	02	04	307	230	298	176	27
078334	364	080	02	07	12	12	08	07	04	07	06	06	06	05	06	84	06	08	06	06	06	03	03	04	04	00	03	05	06	311	240	360	310	59
092601	276	080	03	03	12	12	06	06	06	03	04	05	05	09	05	62	06	04	03	05	06	08	07	08	04	06	05	08	07	333	230	360	246	69
074461	400	090	02	03	12	12	04	04	05	04	04	05	05	08	04	90	03	04	04	06	07	09	06	06	06	04	03	07	04	333	310	400	275	24
086187	380	060	02	01	13	08	09	08	08	08	09	08	07	06	09	00	02	04	06	08	06	05	01	06	04	07	07	07	08	292	240	360	330	92
088007	321	090	02	03	12	10	01	01	08	07	01	07	07	06	06	55	08	06	02	03	05	05	05	05	06	03	05	04	05	333	230	298	218	40
075914	441	150	02	08	13	14	05	09	08	08	05	04	04	03	04	81	05	06	07	07	06	09	05	05	04	04	05	04	06	307	230	360	320	62
081052	308	120	02	03	08	10	04	01	03	04	06	04	05	04	05	60	08	03	03	03	04	05	08	07	08	09	07	04	04	333	230	298	280	26
088692	300	180	02	08	11	12	07	07	08	07	07	06	05	04	05	83	05	07	07	08	06	05	02	04	04	06	05	05	06	307	230	360	243	66
087220	353	120	03	08	12	12	06	06	06	06	06	06	05	06	06	67	06	05	05	06	04	08	06	05	03	07	06	06	07	307	240	360	268	83
081795	314	090	03	05	16	16	03	08	08	03	04	03	06	06	03	00	08	06	06	05	08	07	05	05	06	03	01	03	07	329	230	347	256	78
080102	390	100	02	05	10	11	05	04	04	05	06	03	05	05	02	76	02	04	03	05	07	07	06	06	07	08	06	07	06	329	300	347	350	68
081617	290	090	03	02	08	10	09	08	07	06	07	03	08	06	03	80	02	04	03	05	05	08	06	05	05	09	08	08	06	273	230	360	381	53
075593	313	150	03	06	12	12	04	05	04	04	05	05	06	03	06	00	09	06	05	04	02	01	06	06	09	07	07	04	05	295	290	298	281	49
082739	163	070	03	08	12	12	04	04	05	05	04	04	03	03	04	76	09	05	06	05	03	05	06	05	05	06	04	05	05	307	240	298	169	38

Correlations — Upper Triangular Matrix — Regular Students

	Grade Point Ave.	Commuting Time	Extra Curr. Part.	Occupat. Father	Education Father	Education Mother	Verb. Learn.	Quant. Learn.	Math. Ach.	Nat. Sci. Ach.	Soc. Sci. Ach.	Vocabulary	Read. Comprhen.	Read. Speed	Dream	Fitness Test	Commerce Int.	Engineer. Int.	Math. Int.	Chem. Int.	Geol. Int.	Biol. Int.	Sociol. Int.	Education Int.	Hist. Int.	Engl. Int.	For. Lang. Int.	Fine Arts Int.	High Sch. Rank (sten)	Gr. Pt. Ave. Prof.	H.S. Index	HSR (%)
Gr. Pt. Ave.	1.00	.05	-.10	.05	.09	.05	.18	.00	.16	.25	.22	.11	.04	.18	.15	.23	-.00	-.08	-.18	.04	-.01	-.03	.05	.10	.13	-.00	-.07	-.07	.36	.06	.19	.29
Commuting Time		1.00	-.16	.02	.17	.16	.06	.18	.24	.23	.10	.08	-.06	-.11	.12	.09	.01	.13	.21	.20	.13	.11	-.26	.10	-.11	-.13	-.01	.03	.14	.11	.12	.10
Extracurricular Participation			1.00	-.16	.08	.09	-.21	.01	-.21	-.08	-.22	-.13	-.10	-.24	.03	-.09	.08	.03	.13	.09	-.21	.02	.00	.03	-.24	.00	-.10	.05	.15	-.02	.04	.18
Occupation Father				1.00	-.18	.14	-.07	.01	.03	.14	-.14	-.03	-.09	-.10	-.15	-.05	-.19	.14	-.03	.07	.01	.03	-.15	.05	-.05	-.21	-.00	-.12	-.05	.37	.09	-.01
Education Father					1.00	.46	.09	-.07	.21	.24	.13	.01	.15	.12	-.04	.22	.21	.08	-.01	-.04	-.12	-.01	.02	-.08	.03	.12	.07	-.02	-.06	-.12	.04	-.09
Education Mother						1.00	.05	-.04	.19	.18	-.04	.17	.14	.03	.26	-.12	.31	.14	.05	-.04	-.12	-.08	-.04	-.01	.08	.01	.07	.11	-.10	.03	.26	-.07
Verbal Learning							1.00	.45	.38	.39	.55	.56	.54	.29	.39	.03	.30	-.13	-.16	.01	.05	-.27	.18	.03	.27	.35	.03	-.01	.07	.03	.32	.08
Quantitative Learning								1.00	.54	.28	.30	.23	.23	.04	.46	.17	-.04	-.17	.08	.11	.14	-.05	.04	-.01	-.15	-.01	.06	.16	.28	-.03	.12	.26
Mathematics Achievement									1.00	.57	.46	.42	.37	.39	.55	.03	-.09	-.06	.15	.03	.08	-.08	-.13	-.11	-.11	-.03	-.05	-.06	.15	.01	.05	.15
Natural Science Achievement										1.00	.48	.45	.32	.25	.25	-.00	-.08	.00	.00	.13	.08	.03	-.11	-.21	.09	.14	.08	-.15	.09	.15	.14	.07
Social Science Achievement											1.00	.50	.46	.36	.39	.25	.10	-.13	-.19	-.10	.02	-.32	.07	.02	.34	.29	-.01	-.16	.10	.00	-.14	.09
Vocabulary												1.00	.46	.38	.41	.14	.36	.03	-.11	-.15	.16	-.27	.06	.12	.29	.36	.07	.13	.09	.09	.00	.09
Reading Comprehension													1.00	.55	.33	.05	.24	-.09	-.03	-.22	.02	-.14	.12	.05	.27	.24	.03	-.23	-.03	-.02	.24	.02
Reading Speed														1.00	.25	.04	.16	-.20	-.21	-.29	.01	-.09	.18	.09	.26	.24	.10	-.34	.10	-.08	.09	.09
Grammar															1.00	.17	.17	-.21	-.07	-.14	.00	-.21	.05	.01	-.05	-.08	.10	.04	.20	-.00	.17	.21
Fitness Test																1.00	.01	-.24	-.24	-.19	-.06	.10	.13	.34	.08	.11	.11	.10	.10	.07	-.07	.09
Commerce Interest																	1.00	-.10	-.05	-.33	-.10	-.31	.31	.39	.31	.36	.05	-.09	.02	-.12	-.01	.03
Engineering Interest																		1.00	.40	.50	.19	-.06	-.37	.34	.07	-.24	.00	.03	-.09	-.02	.05	.12
Mathematics Interest																			1.00	.35	.04	-.00	-.28	-.38	-.08	.24	.05	.01	.13	-.05	.02	.11
Chemistry Interest																				1.00	.30	.17	-.46	-.34	-.31	-.31	.05	-.01	.06	-.01	.06	.05
Geology Interest																					1.00	.21	-.22	-.20	-.21	-.30	.08	-.16	.08	.13	-.10	.02
History Interest																						1.00	.08	.12	-.37	-.25	.05	.08	-.22	.19	.10	.23
Sociology Interest																							1.00	.46	.06	.23	-.07	.11	-.10	.01	.01	-.07
Education Interest																								1.00	.03	.23	-.19	.12	.06	-.02	.02	.07
Physics Interest																									1.00	.54	.14	-.17	-.11	.06	-.02	-.12
English Interest																										1.00	.28	-.01	.04	.02	-.03	.06
Foreign Lang. Interest																											1.00	.05	.11	.20	-.11	.09
Fine Arts Interest																												1.00	-.14	.03	.16	.17
High School Rank (sten)																													1.00	-.10	-.16	.98
Gr. Pt. Ave. by Profession																														1.00	.10	-.09
High School Index																															1.00	-.11
Gr. Pt. Ave. (Rank)																																1.00

Correlations -- Upper Triangular Matrix -- Transfer Students

	Grade Point Ave.	Com. Time	Ex. Curr. Part.	Occ. Father	Educat. Fath.	Educat. Moth.	Verb. Learn-ing	Quant. Learn-ing	Math. Achieve.	Nat. Sci. Ach.	Soc. Sci. Ach.	Vocabulary	Read. Compreh.	Read Speed	Grammar	Fitness Test	Commerce Int.
Grade Pt. Ave.	1.00	-.09	-.21	.00	.09	.10	.12	.26	.22	-.01	.12	.11	.12	.19	.26	.21	-.34
Commuting Time		1.00	.04	.11	.04	.13	.17	-.07	-.04	.15	.14	-.01	-.03	.04	.21	-.10	.03
Extracurricular Participation			1.00	.17	-.04	-.25	.15	.26	.24	.08	.15	.17	.15	.00	.28	-.15	.21
Occupation Father				1.00	.03	.22	.01	.14	-.10	.03	-.04	-.08	-.22	-.25	-.02	.05	.22
Education Father					1.00	.72	-.16	.01	.11	-.24	-.42	-.08	-.14	-.18	-.19	.03	.09
Education Mother						1.00	-.07	.12	.20	-.27	-.29	-.20	-.05	-.01	-.16	.17	.12
Verbal Learning							1.00	.52	.35	.45	.62	.67	.49	.18	.47	.09	-.38
Quantitative Learning								1.00	.68	.21	.37	.50	.26	-.04	.44	-.19	-.16
Mathematics Achievement									1.00	.28	.12	.50	.34	.08	.39	-.18	-.12
Natural Science Achievement										1.00	.33	.47	.33	-.01	.21	-.09	-.27
Social Science Achievement											1.00	.33	.32	.14	.31	-.17	-.35
Vocabulary												1.00	.69	.14	.63	-.08	-.28
Reading Comprehension													1.00	.58	.48	-.02	-.12
Reading Speed														1.00	.20	.07	-.18
Grammar															1.00	.08	-.06
Fitness Test																1.00	-.16
Commerce Interest																	1.00

	Engineer. Int.	Math. Interest	Chemistry Int.	Geology Int.	Biology Int.	Sociol. Int.	Education Int.	History Int.	English Int.	For. Lang. Int.	Fine Arts Int.	High Sch. Rank (sten)	Gr. Pt. Ave (Prof)	Gr. Pt. Ave (HSA)	Prev. Gr. Pt. Ave	Pre. GPA	HSR (%)
Grade Pt. Ave.	-.10	.14	.07	.27	.26	-.15	-.09	-.06	-.08	-.09	.02	.33	.06	.17	.46	.45	.37
Commuting Time	-.17	-.11	-.14	-.03	-.08	.10	-.06	.15	.14	.17	-.21	-.17	-.03	-.24	-.34	-.15	-.18
Extracurricular Participation	-.17	.03	-.09	-.25	-.22	.19	.40	.16	.43	.13	.08	-.15	-.12	-.08	-.20	-.18	.18
Occupation Father	.12	.09	.10	-.07	-.22	.11	.04	.06	.04	-.05	-.12	-.07	-.09	.09	-.23	-.18	-.08
Education Father	-.04	.25	-.01	-.00	.01	-.19	-.05	-.05	-.18	-.08	-.02	-.08	.05	.12	.07	-.03	-.06
Education Mother	-.06	.17	-.02	.15	-.05	-.02	.07	-.06	-.09	-.15	-.00	.06	.02	-.01	-.07	.01	.06
Verbal Learning	-.21	.13	.32	.10	.14	.08	.09	.11	.22	.19	.06	.34	-.21	-.27	.19	.38	.32
Quantitative Learning	-.01	.52	.17	.18	.03	-.27	-.14	-.22	-.05	-.22	-.01	.50	-.12	-.08	.21	.28	.47
Mathematics Achievement	-.08	.46	.12	.16	.04	-.29	-.13	-.40	-.13	-.22	.03	.49	.08	-.10	.16	.27	.48
Natural Science Achievement	.09	.14	.35	.07	.08	-.07	-.26	-.36	-.17	-.04	-.07	.01	-.04	-.05	.00	.16	.03
Social Science Achievement	-.10	.02	.21	.10	.00	-.11	-.03	-.03	.26	.23	-.08	.21	-.14	-.19	.18	.28	.26
Vocabulary	-.17	.18	.09	-.14	.00	-.09	.07	-.11	.14	.05	.05	.19	-.08	-.21	.03	.28	.16
Reading Comprehension	-.14	-.14	-.01	.18	.04	-.05	.19	-.03	.04	.06	-.06	.12	-.02	-.16	-.06	.30	.10
Reading Speed	-.17	-.31	-.01	.35	.27	.16	.27	-.14	-.06	.03	.03	.02	-.06	-.18	-.04	.01	-.04
Grammar	-.10	.02	.04	-.02	-.02	-.06	.06	-.09	.15	.11	.09	.32	-.29	-.08	.05	.31	.29
Fitness Test	.12	-.14	.21	.02	.31	-.01	.09	-.06	.09	.14	.15	.01	-.16	.02	.34	-.05	.01
Commerce Interest	.13	-.09	-.49	-.13	-.40	.18	.16	.38	-.08	-.08	-.27	-.22	.11	.01	-.45	-.21	-.22
Engineering Interest	1.00	.30	.36	.11	.00	-.23	-.20	-.26	-.33	-.36	.10	-.07	-.20	.05	.14	-.27	-.08
Mathematics Interest		1.00	.39	-.13	.01	-.46	-.33	-.40	-.27	-.32	-.06	.22	.01	.12	.19	.17	.23
Chemistry Interest			1.00	.21	.54	-.18	-.31	-.46	-.19	-.10	.13	.14	-.17	-.01	.49	-.09	.14
Geology Interest				1.00	.28	-.05	-.30	-.05	-.34	-.32	-.13	-.01	-.04	-.10	.16	-.13	-.06
Biology Interest					1.00	.18	-.24	-.38	-.22	.08	.01	.13	.01	-.14	-.51	.00	.13
Sociology Interest						1.00	.44	.29	.24	.19	-.10	-.17	.00	-.12	-.22	.03	-.15
Education Interest							1.00	.31	.48	.26	.25	.02	.00	-.08	-.21	.11	-.05
History Interest								1.00	.50	.20	-.29	-.33	.00	.06	-.26	-.04	-.32
English Interest									1.00	.39	.18	-.02	-.26	-.06	-.12	.06	.00
Foreign Language Interest										1.00	.03	-.07	-.22	-.20	-.04	.13	-.02
Fine Arts Interest											1.00	.12	.14	.23	.26	.15	.10
High School Rank (sten score)												1.00	.00	-.20	.32	.34	.97
Grade Point Ave. by Profession													1.00	.22	.14	.08	.03
High School Index														1.00	.27	.22	-.16
Grade Point Ave. (Previous College)															1.00	.26	.36
Previous Grade Point Average																1.00	.40
High School Rank (percentile)																	1.00

T——— 198