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The Ohio State University, Ph.D., 1966
Education, guidance and counseling

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DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Allen Edward Segrist, B.S. in Ed., M.A.

* * * * * * *

The Ohio State University
1966

Approved by

Herman J. Peters
Adviser
School of Education
ACKNOWLEDGMENTS

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VITA

September 11, 1931 Born, Wauseon, Ohio

1953 .......... B.S. in Ed., Miami University, Oxford, Ohio


1956 .......... M.A., The Ohio State University, Columbus, Ohio

1957-58 .......... Teacher, Libbey High School, Toledo, Ohio

1958-60 .......... School Counselor, Shaker Heights High School
Shaker Heights, Ohio

1960-63 .......... Assistant Supervisor, Guidance Services, Division of Guidance and Testing, State of Ohio Department of Education, Columbus, Ohio

1963-66 .......... Assistant Director of Admissions, The Ohio State University, Columbus, Ohio

PUBLICATIONS


FIELDS OF STUDY

Major Field: Education

Studies in Guidance and Counseling. Professor Herman J. Peters

Studies in Counseling Psychology. Professor Francis P. Robinson

Studies in Higher Education. Professors Earl W. Anderson and Collins W. Burnett

Studies in Secondary Education. Professors Frederick R. Cyphert and W. Frederick Staub.
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CHAPTER I

INTRODUCTION OF THE PROBLEM

So, then, to every man his chance--
To every man, regardless of his birth,
His shining, golden opportunity--
To every man the right to live,
To work, to be himself,
And to become
Whatever thing his manhood and his vision
Can combine to make him--
This, seeker,
Is the promise of America.

Thomas Wolfe

The opportunity for young men and women today to develop their relative contributions is best enhanced through the educational ladder. Dependence upon formal schooling has become the pattern for depicting job opportunities. This emphasis has been most apparent in the press toward college for educational benefits and experiences. These demands have focused on the process of admissions to collegiate institutions.

The common conception of the problems of admission to colleges and universities centers on the high school student looking forward to becoming a college freshman. The assistance provided to students

---

through their school counselors and college admissions personnel emphasizes the quality of the high school preparation and the expectancies of the college campus. Admissions procedures and school-college articulation emphasize this normal system of transition from one educational level to another.

Less understood and more confusing is the plight of the presently enrolled college student who would attempt to transfer to another collegiate institution. The common assumption is made that something must be wrong, because it is not a normal wish to leave "Alma Mater" for another competing institution. It is satisfactory to withdraw from college studies altogether or to complete them with success and progress to more advanced studies. But to leave before the program has been properly concluded marks the college transfer as suspect and peculiar.

In the face of these conceptions, a fact of importance at The Ohio State University is that for every pair of students admitted as freshmen one other student is admitted who has attended college elsewhere. Only a count of the completed admissions exists to describe the makeup of this group of students. No data describe the typical transfer student, if one is typical. No information has been compiled to compare the successfully admitted student with the one who has been rejected. No local follow-up of the academic success of these transfer students has been reported. No measure has been given to the relative significances of certain conditions and factors which are regularly employed in the admissions process. It appears that the student admitted to The Ohio State University with advanced undergraduate
standing does so with a minimum of personal assistance, advice and information.

**Statement of the Problem**

The problem of this study was twofold: (1) to describe the advanced undergraduate student who transfers to The Ohio State University, and (2) to develop predictive criteria for the admission of these students to specific colleges within The Ohio State University.

The study group was those students admitted to The Ohio State University (OSU) during the calendar year 1964 with advanced undergraduate standing. The independent variables were the grade point average (GPA) earned elsewhere and the American College Test (ACT) standard scores. The criterion employed was their academic success as determined by first and third quarter cumulative grade point averages (GPA).

**Purposes of the Study**

The purposes for this study have been classified to formulate the outline for the study. The first area of purposes concerns the effectiveness of certain intellective variables as predictors of academic success. These include the following:

1. To determine the effectiveness of previous academic performance in the prediction of success at OSU as determined by the GPA in the first and third quarters.
2. To determine the effectiveness of the ACT for the prediction of success at OSU as determined by the GPA in the first and third quarters.

The second area of the study was concerned with differences of performance as they were related to various other factors, including personal-social data. The purpose was:

3. To determine the extent to which sex, former college attended, classification of the college and high school rank in class were factors in differences in performance which existed.

The third area of the study was concerned with the dilemma presented by predictive information and selective bases as reflected in admissions policies. The purpose which emphasized this area was:

4. To compare among the undergraduate colleges the transfer students admitted by regular procedures to those admitted by special action.

**Importance of the Study**

The importance of this study is best depicted by the effects of certain pressures and the needs for reliable information. The following points are demonstrative of these circumstances:

1. Increasing press is placed on young people to make choices among colleges.

2. Increasing emphasis is given to points of transition during undergraduate education; i.e., from junior or community college to advanced standing or pre-professional to professional school.
3. Opportunities for academic recovery are available to a lesser extent.

4. Policies are adopted for admissions standards by necessity of physical and personal limits but are frequently based on opinion or intuitive rationale.

5. Dependence upon testing results tends to provide the basis for confidence in selection by "cut-off" scores.

6. Transfer admissions data have not been regularly collated and reported, and yet could aid in improvement of policy determination and the ritual of practices.

7. Realignment of vocational choice often follows experience and/or awareness in educational and professional training activities and work.

8. The prime factor in the problem is the importance of information from predictive schema to the individual student. The prospective student could be more efficient in his choice-making when he uses the comparative odds; he may even become more motivated to meet the challenge.

The points above represent the range of important contentions observed to operate, reflecting motives of efficiency, economy, and humanity. Some suggest that the attrition rate of college students is too high, too expensive, and too wasteful. But others recognize that

the so-called "open-door" system of higher education has been an American strength emulated by the other countries of the world.³

Most emphasis has been placed on the effects of mobility through the educational opportunities of the American system. The several avenues and points of transition extend the variety of choices and pitfalls of possibilities. Neudling, in his contribution to review of research,⁴ reported that the articulation process has been stimulated by the growth of junior and community colleges, even extending upward to graduate and professional schools.

The most apparent shortcoming in the widespread interest in higher education is the paucity of legitimate research information. Hardee stated that "pronouncements about college students, the college environment, the interaction of students and campus are being made by educators on something less than the results from systematic research."⁵ So, the subject's popularity has not been dampered by the inconsistency apparent in the shortage of legitimate conclusions from research.


And yet, as Gummere⁶ pointed out, about one of five students entering college is in actuality a transfer student coming from another institution of higher education to enter with advanced standing. At The Ohio State University, it appears that one of every four entering students is a transfer from elsewhere. Young⁷ learned that in spite of increasing numbers of transfers very little research has been conducted on them. The few reports reflect institutional interest with small populations. Whether or not similar to processes of admission for freshmen, the lack of understanding about the qualities of admission features in the transfer of students from one undergraduate campus to another leads to specious reasoning and authoritarian policy development. Hence, the importance of the problem is significantly related to the ratio of known to unknown.

The point of view of this writer supports the development of individual persons in increasing awareness of themselves. This concept of self-growth can be related to the choice-making in admissions and the educational-vocational implications of the transfer from one college to another. The elements of concern primarily based on manpower utilization and control of economic waste and loss are not prime contributors to this viewpoint. The implications of responsible self-choice and maximal experience in education for each student reflect


indeed upon the economics or population parameters so typical in today's federal and state legislation affecting educational services. But the inherent emphasis is placed on the individual person and his maximal utilization of his strengths and weaknesses. With each earning his greatest achievement, he contributes to the greatest state of the society.

The importance of this study is related to supplying the descriptive and predictive information to be used by individual students as they plan their educational and vocational patterns in their careers of life.

**Definition of Terms**

**Transfer.** The advanced undergraduate student admitted to OSU has completed some college study elsewhere and has been considered in recognition of that experience.

**GPA.** Grade point average includes all courses attempted and all credit points earned. An "A" equals four points, "B" three, "C" two, "D" one, and "F" zero. GPA refers to the average earned in former college studies and to the marks earned at OSU.

**Regular admission.** Admission as a regular procedure is accorded to applicants, male and female, who meet the minimum requirement of 2.00, or "C", in previous college studies.

**Special action admission.** Admission by special action is approved for those applicants who are Ohio residents with less than 2.00 standing if the following conditions are met:

1. He has been encouraged to raise his standing with additional study elsewhere.
2. He has been invited to take special testing available regularly on campus.

3. If suspended or dismissed, he has met a period of deferment of six to twelve months.

4. After testing with ACT, he has been approved with scores of average college-level.

5. The statement "Admitted by Special Action of the Admissions Office" is entered upon his records, although no probationary status is otherwise designated or required.

Limitations

The study is limited because it can make few comparisons with other studies. Generally no standards exist to describe the "normal" population of transfer students; therefore, the relationships which are developed cannot necessarily be taken to be definitive, but may serve as groundwork for developing further hypotheses for research.

Additionally, the outcomes may be said to be distorted by the idiosyncratic features of the local institutions. The smaller colleges of the University may not give thoroughly effective information because of the restrictions of the sample size. The outlines of the individual colleges may not be so discrete that the strength of purposes of individual students in their specialized or unique needs will be obliterated.

This research employed as the study group those who were admitted to the University during the year 1964. No particular
conditions existed which tended to mark this group as different from those admitted in prior years. However, the stability of the total number of admissions from one year to another coupled with the fact that this group was admitted under continuing practices for admission policies, similar for males and females, suggests that in fact the year 1964 was the last of the normal years.

The factors of the former college attended and the marks earned there impose obvious differentials in terms of standards and expectancies for performance. It is probable that each college in the country has a similar distribution of marks earned by students. However, the level of the "C" may be like oil upon the water, rising and lowering with the tides of potential and performance. The classification of these former colleges by the U. S. Office of Education is only one means of classification which could have been employed, but represented an approach for which some data have been developed in the national program of ACT.

This study did not include analysis of the individual interests or subject preferences of students. The segmental breakdown of these interests referred to the college of admission only.

Limitations are inherent in all statistical methods; therefore, to some extent limitations may exist in the statistical methods used.

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in this study. Appropriate controls, corrections and tests have been 
employed when needed.

The next chapter is a review of literature of relevance to the 
problem of studying the college transfer student.
CHAPTER II

REVIEW OF LITERATURE

Introduction

To establish the background for this study, this review of literature presents a systematic and concise analysis of the writings and studies which reflect upon the admission of the transfer student. The citations included have met a test of relevancy to the problem and have been viewed with a critique of the nature of their contributions. The emphasis has been upon prediction studies, particularly as these reflect upon admissions policies and other educational programs. The actual contributions of professional literature and scholarly research provide guidelines for the development of policies and practices which can be based on heuristic or empirical evidence. The implications of these several studies have been utilized to varying degrees by colleges and universities in assessing or directing their own particular activities. Sometimes it would appear that the research had been conducted simply because of the convenience of the study population offered by the student body.

Need for research

The need for scholarly research has been regularly demanded and emphasized. The preceding chapter on the importance of the problem
employed Hardee's opinion\(^1\) that something less than systematic research was the general rule and yet pronouncements of policies and practices were devised to regulate educational matters. Young\(^2\) also could report that little actual study had been accomplished for the special group of students who transfer from one institution to another.

Gummere asked the following questions:

Some think a transfer is a better risk than a freshman. But do transfers actually improve after switching? Do they get what they want by transferring? How does their shuttling around affect the institutions involved?

In general, no one knows the answers to these questions.\(^3\)

So, Gummere proceeded to gather his thoughts and essay his opinions but could not add substantive data gleaned from research.

**Popularity of studies**

Although little has been done for the transfer student, the fact remains that perhaps the most popular field for research is that of academic prediction. The professional literature in educational and psychological journals contains numerous studies on the prediction of academic success of college students. Fishman and Pasanella\(^4\) in their

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\(^1\) Hardee, loc. cit.

\(^2\) Young, loc. cit.

\(^3\) Gummere, loc. cit.

review of the literature on college admissions and selection studies indicated that this field has become the most actively studied topic in educational research. A review a decade earlier had showed 194 studies; their review located 580 in the ten years to 1960. They reported that these generally reflected the availability of the population for study and an integral interest in research on such campuses.

But little research, if any, is available on the transfer student. The study of Iffert\textsuperscript{5} on the retention and withdrawal of students was a massive project which helped to delineate the problems of follow-up of the college student. But few institutional studies have been reported as well as the broader survey. The most concerted efforts representing their vested interests have come from the junior colleges.

Overview for the sections

Because of the numerous studies completed in college admissions and selection, the review which follows has been made to spotlight the significant conclusions which are extant. The sections to follow focus on the review of the literature in specific detail. The following major sections will be discussed:

1. Research relevant to the problem
2. Research relevant to the instrument

Research Relevant to the Problem

Many studies and other writings with problem relevancy can be cited. From the copious supply of potentially applicable reports, this selection represents a critical survey of the literature. This review section is organized to follow the outline of these topics:

1. Academic prediction
2. Admissions policies
3. Education and guidance policies
4. Transfer students

The first topic represents the emphasis of the first, second, and third for this study. The second and third sections contribute understanding for the fourth purpose. The fourth section on transfer students emphasizes the dearth of reported literature on the special group in this study. This outline has been devised in the manner listed to depict the general principles of measurement and prediction, to reflect these in actual policies which have been developed, and to dramatize the paucity of actual study on the transfer student.

Academic prediction

The increasing incidence of studies of academic prediction is confounded by the ambiguity of predictors and the lack of reliable criteria. As cited by Fishman and Pasanella⁶, the frequency of studies of this topic has risen greatly in the decade of the 1950's. The topic is popular in attention though not always fruitful in effect. Endler

⁶Fishman and Pasanella, loc. cit.
and Steinberg\textsuperscript{7} criticized the assumption of adequate academic marks as the standard for college success. They extended their remarks to include the effects of the interaction of numerous factors; e.g., aptitude, previous achievement record, personality and health, social factors, maturity and attitudes of parents and family. The frustrations presented by these writers have not caused a restriction of studies in the field; they have continued to be numerous and have somewhat different emphases, as highlighted by the following statement:

College prediction studies, though considered a sterile field by many psychologists, have shown some new emphases in the past several years. One has been the utilization of more homogeneous groups of students rather than studying the entire range of ability and curricula concurrently. . . . Use of new prediction models . . . might be considered a second new emphasis.

A third, though not so new, trend is a greater emphasis on non-intellectual predictors.\textsuperscript{8}

It is generally agreed that the accessibility of the study populations and the importance of new predictive devices and their validation continues the burgeoning literature of these studies.

Bereiter warned of the frequently negative results of studies inherent in review of the problems of effects of counseling or

\textsuperscript{7}Norman S. Endler and Danny Steinberg, "Prediction of Academic Achievement at the University Level," \textit{The Personnel and Guidance Journal}, XLII, No. 8 (April, 1963), p. 694.

educational policies. He contended that the researcher will institute studies the nature of which will portend results with statistical significance so that something of conclusive nature can be reported. He mentioned that the researcher "sometimes . . . goes so far as to make predictions where there is no use in making them: predicting success in a course which all students must take, predicting progress in therapy when there is no intention of turning away unpromising clients." But the cautions which should be obvious to employers of research data and conclusions do not inhibit the need to know the up-to-date information by those who work with young people in the making of their educational plans. McCormick and Asher reported that "high school counselors and college admissions officers are in desperate need of more valid and reliable measures for prediction of success in colleges and universities."10

This need to know and to develop these sources of predictive information is mixed with the cautions of responsibility for professional know-how. Such sophisticated data as developed in some studies are not so well understood by those not prepared adequately in professional competencies. A frequent device of value and worthwhile assistance is the college characteristics profile developed from frequency tables. But Hills from his experience with the state-wide


program developed in Georgia warned of the errors in the use of test scores from profiles; i.e., (1) judging institutional quality as the jumping-off place for the student rather than the progress and achievement records made by a student in a long-range period, and (2) treating the mean test results of the college as if these were the minimum or cutting scores of that college. He emphasized that "it is important that the probabilistic nature of these predictions remains prominent in the minds of the counselor and counselees." The implications of the limitations of the data should be at least as prominent in interpretive sessions as the conclusions from the same data. The general applications are more broadly conceived; the individual assimilation must be careful and so qualified as the perceptions of the student dictate.

Fishman and Pasanella in their review of the literature reported that the common design for the research studies was correlation and regression with one or more predictors "attempting to approximate one or more criteria." These have been accepted as predictors and criteria dealing with either intellective or nonintellective characteristics. Brown and DuBois noted in a previous citation the increasing emphasis placed on nonintellective predictors. They concluded: "A common logical, though not statistical, approach is to assume that a


12 Fishman and Pasanella, loc. cit.
minimum amount of scholastic aptitude is necessary for academic success but that above this minimum, success is determined more by non-intellectual variables.\(^{13}\)

The split of emphases between intellective and nonintellective variables as employed in the plentiful studies surveyed is the basis for the following analysis and report of the literature. The material of the next section reflects the conclusions based on these factors.

**Intellective and nonintellective factors.** This section reviews the studies which reflect the contributions of the range of factors both intellective and nonintellective in nature. Studies employing primarily intellective criteria are most common in regularly completed research. Primarily studies of grade point averages and their prediction are emphasized. The applications of academic ability and achievement test results in the prediction of academic success generally involve somewhat more sophisticated research methodology. As was indicated by Fishman and Pasanella,\(^ {14}\) these intellective factors are firmly entrenched as the factors employed in the selection and admission of young people for colleges. The following material reflects studies and commentary upon the factor of GPA prediction and then upon those which more specifically related to the proficiency of testing results as predictive devices.

\(^{13}\) Brown and DuBois, loc. cit.

\(^{14}\) Fishman and Pasanella, op. cit., p. 306.
Fishman and Pasanella pointed out:

The most obvious intellective predictor is the high school record, usually expressed as total average grade or rank in class. For 263 studies in which it was employed, this measure correlated roughly .50 with college freshman-year intellective criteria. In 31 additional studies, it correlated .48 with college intellective criteria beyond the first year.\(^\text{15}\)

Welck\(^\text{16}\) reported steady, nearly efficient, results of the combination of high school marks of "C" or higher with testing results to devise stanine distributions for students enrolling at the University of New Mexico. He indicated that this high school mark average "does a rather effective job in excluding students of low ability and achievement." His study confirmed the "superlative job" of the data in identifying the satisfactory students.

Jackson, in a study involving students at Michigan State University, reported on the prediction of academic success of college freshmen. His results indicated a somewhat lower relationship of GPA with the predicting test for men than for women; the correlations were .43 and .52, respectively. He concluded with the generalization that "the percentage of an ability group failing to obtain at least a C average increases as the ability of the group decreases, but some students in the low-ability group make satisfactory grade point

\(^{15}\)Ibid., p. 300.

averages. The statement would appear to be a sine qua non of statistical manipulation, but is not represented in the efficiency of the "superlative job" lauded by Wellick in the study reported above.

The pitfalls of the GPA as a factor were thoroughly discussed by Chansky. He commented quite basically that

Once determined, the GPA is a seemingly continuous variable with units correct to two significant digits to the right of the decimal point. In this form it is manipulated in predictive and comparative studies. In addition, GPA is a vital statistic referred to in making decisions about placement and selection.

The particular shortcoming which was most impressive to him was that the grade, the mark itself, as the essential unit of the GPA, "has no inherent stable meaning." He further analyzed the failure of marks and the system to resemble the normal distribution required in parametric statistics. He recommended that grades are indicative of the order of achievement in a nominal scale, but that then the GPA is the modal grade. This is not completely extended because the categories are not equal. He recommended the ordinal scale to be the most suitable means of distribution, which does not require any assumption of the shape of the scale; by this device he suggested that the median would be the GPA. He concluded that the findings would be limited to


19 Ibid.
the particular population under study because GPA would be a non-parametric technique. This is implicit in the variance of schools and colleges in curricular goals, local population, and marking practices.

The outgrowth of the GPA as a means of administrative policy led into the determination of "cutting-off" zones. The category of probation was reviewed by Crane in a study at Eastern Michigan University. He implied that, although the system was established as a second chance for students who had not done well, it was in essence "a second chance for success for a minority and a second chance for failure for a majority." He indicated that the study results pointed up the conclusion that "the aptitude test scores did not suggest that a lack of basic skills was the reason for poor grades."

Doleys and Renzaglia injected an interesting element into the research on the GPA with their report on self-estimates of college grades. They reported that student predictions of marks are significantly accurate predictors, although not so accurate as are actuarial predictions made from scores on a college ability test. They introduced the element of individual differences with the conclusion that

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21 Ibid.

"intelligently more able students tend to underestimate or accurately estimate their college performance, while less able students tend to overestimate their future grades."

As the studies and comments indicated to this writer, the contributions of the GPA are available, entrenched, operant, and potentially more useful in adaptation to special groups and individual students. The next materials review the implications of testing data as a major area of intellective prediction.

The studies covering the employment of standardized tests as predictors of academic success are more common. The reports of correlational studies are plentiful indicating the nearly universal acceptance of the basic strength of the standardized data. This allows comparison with national populations and longitudinal extension of results based on local norms.

Fishman and Pasanella have reported the general correlations of several studies employing tests. In 62 studies employing counseling and reading tests compared with freshman average, the correlations ranged from .13 to .64, with the median correlation of .47. Achievement tests were the basic predictor of 84 studies of freshman average with correlations of .03 to .74 and the median of .45. Studies beyond the first year numbered 18 in which the median was .43.

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23 Ibid., p. 530.
24 Fishman and Pasanella, op. cit., p. 300.
Multiple correlational studies with freshman average were 216 in number; the range of correlations reported was .37 to .83, with the median of .62. Eleven studies beyond the freshman year showed a range of .50 to .72 with a median of .65. The reviewers observed that the narrowing of the range of the study population reduces the quality of the multiple correlation.

Barclay \(^{25}\) has observed that "the best correlations of entrance batteries in college with grade point averages range between the 0.60-0.70 level." He confirmed the difficulties inherent in the population of college students in the following statement: "Obviously there are many students who score highly and still fail in college level work. There are others who are apparently low in academic promise and may end up in the upper ranks of graduating seniors." \(^{26}\) He introduced other elements of distraction in the gathering of tight predictions; i.e., GPA, institutional differences, departmental similarities.

Nothman \(^{27}\) reported a significant correlation between college entrance test results and changes in marks and attitudes of students who took part in group counseling for probationary students. Generally


\(^{26}\) Ibid.

students improved their standings more readily if their potential was higher and if they accepted positive standards for academic improvement. Sgan reported low to moderate correlations between test scores and GPA from year to year in his study. He indicated the following:

It seems quite obvious that the higher SAT score intervals yield the greater number of top academic students and the least number of bottom academic students. It must be observed, however, that all intervals (with one exception) contributed to both the bottom and top of the graduating class. The prediction at lower levels appeared to produce general information which had to be adapted to the needs of individual students.

Kirk and others at the counseling center of University of California, Berkeley, reported on some of the complications of the use of subtests and results for the differential prediction of area or major field success. It must be known whether or not a subtest result is more predictive to a significant extent of GPA than other subtests or the composite. Differences contributed by the major field are also important. They were also concerned with the development of characteristic patterns of abilities.

Other studies report on the contribution of high school rank as it reflects itself in the prediction of college-level success.

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McCormick and Asher concluded in their review that most prediction studies indicated a consistent validity of certain variables of prediction. They reported the following:

The correlation between general college freshman achievement and high school achievement is about 0.56; between general achievement test scores and college freshman marks about 0.49; and between measured intelligence and college freshman achievement about 0.45.  

In a particular study connected with selection for pharmacy, Lewis at the State University of Iowa reported the effects of four variables: high school rank, high school GPA, number of high school physical science units, and entrance test composite scores. The following conclusions were reached:

1. High school rank and entrance test composite scores were significant predictors of freshman GPA.

2. Freshman GPA and entrance test composite scores were significant predictors of sophomore GPA. Freshman GPA contributed more to this prediction than test results.

3. None of the pre-college variables was significant for predicting achievement beyond the sophomore level.

This study emphasized the importance of actual achievement on location for extension into prediction of later achievement.

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30 McCormick and Asher, loc. cit.

In his study, Scannell reported that "high school GPA was the best single predictor of college success yielding correlations of .67 and .59 with freshman and four-year GPA, respectively." He inserted the other finding that this was not significant for those students who entered college from small high schools.

Nichols and Holland reported some of the efforts employed in discriminating finely in the selection of students in the National Merit Scholarship Program. Their several conclusions included the following:

1. Further selection employing an additional aptitude test did not improve appreciably selection for high-level college performance.

2. Selection on high school rank as the basis produces high academic performance, but not necessarily other kinds of achievement.

3. A broad range of high school achievements employed in selection produces a broad range of achievements at college without lowering the level of academic performance.

The authors concluded that "clearly the best of the objective selection methods were the two methods based on high school achievement." They confirmed the strongest effects of this factor were as a predictor of similar high achievement at the college level.

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34 Ibid., p. 39.
Endler and Steinberg reported a study of the relationship of high school standing with college success in Canada. They concluded that the results of their study indicated "that the best single predictor of the first year college Final Grades Average was the Grade 13 High School Average for both the Male and Female samples."  

A study by Nunnery and Aldmon surveyed the effects of undergraduate marks as indicators of success in graduate programs, in this case, in the education field. They concluded that "the over-all undergraduate GPA will tend to differentiate those students who achieve the highest from other students." Their study included more than 80 graduate students from each of two undergraduate programs.

Usage of the data is implicit in its development. Barclay stated the simplest conclusion about the employment of testing results: "Without testing, the only alternative would be to return to judgment based on subjective criteria whether empirically derived from individuals or groups of individuals or simply by personal intuitive means." His confirmation is implicit in his phrasing; statistical prediction may be adjusted by, but cannot be substituted by, clinical conclusions.

The term "nonintellective" attempts to describe by the effect of negation from the more clearly understood intellective factors; cognitive

35 Endler and Steinberg, op. cit., p. 697.
36 Michael Y. Nunnery and Howard F. Aldmon, "Undergraduate Grades as Indicators of Success in Master's Degree Programs in Education," The Personnel and Guidance Journal, XLIII, No. 3 (November, 1964), pp.280-86.
37 Barclay, op. cit., p. 16.
and affective have identified the factors, perhaps, more definitively. But it can be shown that some terms may be cognitive in nature without necessarily being intellective in limit. The often unexplained factors of effect in studies are suggested to be the personal whims or vagaries of the human being.

Nonintellective factors are often the unexplained conditions of effect which determine the rest of prediction formulae and explain the individual exceptions. Brown and DuBois cited this continuing trend of emphasis on nonintellective predictors. They stated: "A common logical, though not statistical, approach is to assume that a minimum amount of scholastic aptitude is necessary for academic success but that above this minimum, success is determined more by non-intellectual variables."\(^3\) But Lehmann pointed out that "we all know that our cognitive measures only account for, at best, about 40 per cent of the variation in grades."\(^4\) He suggested that this fact may be responsible for the recent impetus to study the effects of nonintellective factors in the prediction of academic success.

Lang and his co-authors\(^4\) concluded that the college’s reliance on intellective factors as admissions criteria should be challenged by nonintellective factors, such as psychological needs as "important, if

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\(^3\) Brown and DuBois, op. cit.


\(^4\) Lang, Sferra, and Seymour, op. cit., p. 359.
not more important, determinants of college success." Capretta et al. 41 decried the fact that little has been done to supplement objective criteria with information concerning noncognitive variables; i.e., attitudes, motivation, values, personality characteristics.

As Fishman and Pasanella pointed out, most studies are currently employing multiple conditions with intellective and nonintellective factors being included. They reported 42 that the numbers of studies employing these factors will continue to rise because of the expansive interests of institutions to attempt to understand the range of the contributing factors to academic success. They concluded that over 90 per cent of those studies reviewed were concerned with the criterion of earned marks as predicted by intellective, nonintellective, or both sets of factors. But those studies employing nonintellective predictors were less than one-fourth of this group.

Generally the reason for this shortcoming in proportion of studies undertaken is reflected in the questionable conclusions which have resulted. Juolo concluded that his review of studies intended to isolate noncognitive correlates of college success showed "that the multitude of studies have been relatively unfruitful." 43 His study ended with


42 Fishman and Pasanella, op. cit., p. 299.

the conclusion that non-cognitive inventories as predictors of academic success proved totally inadequate. Stone and Foster stated that studies of personality measures are seldom of any practical value in academic prediction beyond that obtained from intellective measures. They suggested that intuitively they suspected that personality factors were important in college success, but that perhaps the scholastic ability tests are confounded by these variables of nonintellective features.

Nichols and Holland in their study of top scholars learned that the addition of personality and interest variables to evidence of high school achievement tended to decrease selection efficiency. They also reported that with a heterogeneous group with a not too high rejection rate that selection is difficult to improve by adding non-intellective predictors to measurements of aptitude.

Fishman and Pasanella summed up the elements of the dilemma with their conclusion:

Few studies came to the point of combining intellective and nonintellective predictors by means of multiple correlation techniques. Where this was done, the gain in multiple correlation attributable to the nonintellective predictor was discouragingly small. As a result much of the literature on nonintellective predictors dealt with attempts to improve their technical and theoretical foundations.

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45 Nichols and Holland, op. cit., p. 33.

46 Fishman and Pasanella, op. cit., p. 303.
They stated that the optimistic ambition of researchers on the basic ideas of prediction by nonintellective factors is that some of a group of applicants of similar superior academic talents will be better able to apply their talents to college work than others, as a result of motivational, attitudinal, or personality factors. As this preceding overview indicates, little is truly known, much is hoped for, and efforts are still being made to refine the procedure.

The differential aspects of the demands of colleges of the university were discussed by Brown and DuBois. Their findings showed that students' characteristics are rewarded differently by colleges within the same university. Their results revealed that engineering students had high scholastic aptitude, effective study habits, conforming tendencies and high aspirations. Students in liberal arts had good ability and high aspirations but did not appear to be so hard driving and efficient. They tended to be more flexible, aesthetic, relaxed, and acceptant of educational philosophy and goals.

A recent study by Brown and Russell depicted the problems of present selection standards when used with culturally disadvantaged students. The overuse of standardized testing results to the exclusion

47 Ibid., p. 304.
48 Brown and DuBois, op. cit.
of other factors; e.g., 'personal discipline, study habits, parental influence, the influence of certain teachers and counselors, and the determination to overcome odds imposed by limited educational and vocational opportunities,'\textsuperscript{50} ignores the effects of these operative factors. They recommended provisional admissions to serve as demonstrations of academic worth.

The demands of the college curriculum are normed on grading scales which accept the pass-fail model. Congdon reported a study of the relationship of personality factors to the successful and failure groups. He reported the following conclusions for the successful students:

Their involvement, rather than being narrow or exclusive, tended to be broad; they demonstrated a minimum of avoidance; they were likely to be more rather than less involved with their own age group; and they revealed more self-acceptance in that their test data showed fewer reaction formations.\textsuperscript{51}

For the failure group, he reported that "the group revealed more intense needs in relation to parents; more avoidance of environmental demands; less involvement with their own age group; and greater frequency of emotional conflict."\textsuperscript{52} These results indicate support of differential prediction of factors of personality. Crane\textsuperscript{53} reported a study of the

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\textsuperscript{50} Ibid., p. 304.
\textsuperscript{52} Ibid., p. 774.
\textsuperscript{53} Crane, op. cit.
effects and outcomes of the policy for probation. While the policy gave students a second opportunity, in essence it supplied that circumstance to a few whereas the majority failed again. He suggested that the system did not supply a motivational role. He found that aptitude scores did not reveal differences between the groups but that a lack of basic skills was the suggested reason for poor grades. He concluded that nonintellective factors had great bearing upon success and that a definite program emphasizing these factors could be established.

Differences between student groups were reported in additional studies. Capretta et al.\textsuperscript{54} depicted Honors group students as oriented toward academic work and rather flexible thinkers; unsuccessful members of the group and those not accepting the program followed a more practical approach to college and were more constricted in their thought.

Over- and under-achievement was the topic surveyed by DeSena\textsuperscript{55} with 1,061 freshman male students. He determined that such common nonintellective factors as interests, personality, problem areas, values, personal background and academic and social adjustment to college do differentiate the over-, normal and under-achieving students.

\textsuperscript{54} Capretta et al., op. cit.

He described the over-achieving student with the following characteristics:

- Stable measured occupational interest pattern
- Increasingly strong interest in chosen curriculum
- Self-sufficient but increasingly submissive
- Concentration
- Serving fellow man
- Strongest values theoretical and weakest esthetic
- Hesitant to discuss problems
- Desire to attend graduate school
- Not in disciplinary action
- Curricular acceptance
- Studying, self-directing
- Concerned and conscientious about academic work

Wyer and Terrell\(^{56}\) reported on the motivational variables and personality factors behind achievement differences for college males and females. They concluded that (1) male overachievers are typified by an intense desire for a career to be attained through academic competence, perhaps generated by excessive parental demands, (2) male underachievers may react against a restricting academic environment in which they feel competent, (3) female overachievers may be sublimating feelings of social inadequacy with high academic interest and are seen to be timid and insecure with high social needs, and (4) underachieving females are relatively socially independent. They contrasted the aspirations of males and females on academic ambition and social goal attainment.

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Jackson reported commonly assumed conclusions in his study of the prediction of academic success of college freshmen. He found a correlation between GPA and ACE for men of .43 and women of .52. The women obtained significantly higher marks than men and tended to perform more nearly in accord with their abilities. Summerskill and Darling reported a study of 1,018 freshmen who entered college in 1949. In four years a 40 per cent rate of attrition had occurred; more women than men had left without scholarship difficulty. Shaw and Brown also studied underachievement of bright college students by emphasizing causal factors. Their findings showed that level of ability and achievement test results do not vary, although the GPA does significantly. They identified the personality characteristics of effect, such as hostility toward others or authority, perhaps unconscious or masochistic in form.

Watley and Martin in a study of the prediction of successful students in a college of business administration distinguished between males and females in a multiple regression analysis. For the

57 Jackson, op. cit.


male business student they found a multiple correlation of .82 for GPA with (1) Restraint and Thoughtfulness traits of the Guilford-Zimmerman Temperament Survey, (2) Scholastic Aptitude Test Verbal and Mathematics scores, and (3) high school rank. They concluded that the combination of these factors could be identified as a "studiousness" factor, composed of traits of serious-mindedness, deliberateness, persistent effort, self-control, reflectiveness, meditatively, interest in thinking, and mental poise. The academically successful females did not possess high scholastic ability but were highly motivated and efficiently applied. The marginal students of both sexes were found to be identified by the traits of deliberateness, inefficiency, low production, carefree, and impulsive.

DuBois and Wientge attempted to study the variables that are related to age as a factor in academic prediction. They concluded that a selection of significant items may be useful in forming a maturity scale to help in the prediction of adult students. The factors indicating a correlation of .20 or higher were summed to devise a "maturity scale." This scale showed a correlation of .68 with age and an internal consistency coefficient of .81, but showed a validity of .18 for predicting academic success. They concluded that chronological age has much overlap with other biographical factors which only appear to be different.

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Herriott wrote on the social determinants of educational aspiration. He recommended that the variables of sex, family educational level, and income level rather than being determinants of educational plans ought to be identified as predictors of such in association with other variables. He discussed the individual person's frame of reference and the reference group with which he identifies. He concluded that a higher self-assessment means higher educational aspiration. He drew the inferences which can be contributed from social theory and structure, population and class mobility, and demonstration projects of cultural manipulation.

Washburne reported a study of the relationships of socio-economic status, urbanism and college performance. He opined that social factors are employed openly in admissions policies. Not only are these hard to measure but sometimes hard to defend. He reported that his study found that once the student gets to college the socio-economic status of his family has nothing to do with his academic performance. He also learned that students from rural areas did less well than students from urban areas up to the population of 500,000. At that point students from even larger cities tended to show divergence in their academic performance. The relationship disintegrated into a complete distribution.

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The consistent findings of a study by Barger and Hall developed the personality patterns of dropouts, low achievers, average achievers and high achievers after one year of college. High points on the MMPI described the classes of achievement. The low achievers and dropouts were typically high on the scales of deviant behavior and activity or energy level. For these classes there were lower correlations between SCAT and GPA. Males and females who score higher in the masculine direction of Scale 5 (Mf) drop out at a higher rate than those who score in the feminine direction. The authors concluded that mean ability scores provide the comparison for standing, but that the range of scores for dropouts extends into the upper range of those who received passing marks. They suggested that the unexplained variance could be attributed to nonintellective factors such as personality characteristics and socioeconomic differences.

The Fishman-Pasanella review reported on the several studies utilizing nonintellective data and inventories for academic prediction. The Rorschach and MMPI were utilized in 26 studies with correlations ranging from .01 to .62 with median of .22. The use of study habits inventories were in 25 reports with the range of correlations from .26 to .66 with a median of .47. Interest inventories, Kuder or Strong, were reported seven times with correlations from .05 to .26, although

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65 Fishman and Pasanella, loc. cit.
no median was reported for this small group. Biographical information and other socioeconomic data were utilized in 23 studies with correlations of .01 to .63 with a median of .13. Ratings and interviews were evaluated in nine studies with correlations of .26 to .77, the latter in a survey of counselor rating. These studies showed the spread of results with generally low effect.

Teahan\(^\text{66}\) contributed an interesting study on the effects of parental attitudes on college success. He particularly emphasized the students' perceptions of these attitudes. He concluded from the observations of some of the low-achieving group that they were accustomed to supervision and a dependency relationship. He found that both parents of low achievers demanded more unquestioning obedience and were more punitive in nature. For the low achieving male student, the picture emerged of a father-son relationship typified by the clash of a domineering, punitive and over-protective father with his offspring.

This section has surveyed representative studies of intellective and nonintellective factors as these predict academic success. The overall conclusions are represented in the inconsistent findings which are consistently reported. The factor of GPA seemed to be the most effective single factor in predicting academic standing, whether from high school rank or average or college marks. But dependence upon this measure supplies its own reinforcement for policy decisions; the

inherent difficulties of marking systems, both departmental and institutional, tend to be ignored as practice dominates. Similar conditions can develop from over-dependence upon testing information, the next significant contributor to academic prediction. But each of these factors and both together appear to describe the predictable portion of the achievement record. The remainder and the exceptions to the rules are provided by other factors which include nonintellective measures of personal-social and motivational natures. There remains enthusiasm to continue the search to isolate the controlling factors for achievement. It appears that descriptions of achieving students can be built to test as models for others. But the human factor of individual choice seems to hold the clue for the ultimate prediction of each person's actions. The optimism that certain of these factors can be identified to pinpoint their differential contributions in the success of students is focused on improved techniques of research and statistical treatment.

The next section extends the area of academic prediction by reviewing the contributions of the literature to the dilemma of prediction versus selection.

Prediction versus selection. The issue of prediction versus selection is mainly concerned with the development of reliable information from studies of academic behavior. Confusion exists in the relationship of prediction and selection. It is often characterized as a dilemma because it is so often assumed that one is inseparable from the other. The logic of the relationship appears to be that predictable information
can be utilized in a process of admissions to those colleges with relatively unselective standards, but that when restrictive requirements must be met in order to be selected for admission this process should be based on reliable information concerning academic prediction.

Ghiselli carefully outlines how judicious selection of applicants on the predictability of certain responses will result in better culminating prediction. He recommended that "in an institutional selection situation a predictability test can be used to pick out those applicants to whom the selection test can be applied with best advantage." The prediction is necessary to complete the selection most effectively.

Fishman and Pasanella in their review discussed the increased incidence of testing and the consequent rise in validation studies of the admission of guidance procedures. The institutions employing these evaluating instruments for considerable periods of time seek continuing improvement of technical proficiency and substantiation of the philosophical bases in the increasing applications of these data. The reviewers suggested: "The degree of predictive approximation to the criteria that is attained upon a relatively unselected group of applicants is taken as an indication of the efficiency of the particular set of predictors employed." This approach indicates the validation

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68 Fishman and Pasanella, op. cit., p. 298.
of procedures employed must be a continuing process to function as justification for these activities.

Warnings on the extension of valued predictive systems have been submitted so that clarification of the variable effects of several factors will receive continued study. Holland, concerned with emphasis upon the creativity of students, stated in a report of study with superior students that

The implications of the present investigation, which are consistent with our growing knowledge of creativity, argue against the uncritical use of high school and college grades as predictors of post-college achievement and as unqualified criteria for selecting persons for admissions, scholarships, fellowships, or jobs. Similarly, the prediction of college grades appears to be an increasingly dubious research enterprise. It seems preferable to develop more valid criteria of independent achievement and creativity, even though colleges may not recognize and reward these tendencies. To continue the prediction of college grades only reinforces their somewhat specious validity and delays the development of more adequate criteria and the subsequent re-examination of educational goals and practices. 69

He warned of the inherent dangers in the continuation of a value system based on marks in high school and college as evidence of superior achievement. The facts of lives make these assumptions specious in their validity.

Robertson extended the warnings of the excesses of selection procedures which support the institutional status quo. He stated:

With more and better-prepared freshmen applying to colleges and universities each year, much attention is being given to refining selection criteria and to improving the administrative techniques for registering and classifying the students once admitted. But in this growing preoccupation with test scores, data analysis, and systems control, we may be drafting a blueprint for a brave new educational world in which concern for the individual student is lost. For students who falter and fail, the future may be even more bleak. 70

He proposed the need for intelligently devised and effectively administered procedures for minimizing and salvaging failures, and suggested that the "brush with failure" may provoke the response for success.

Lehmann commented in his review of publication on college achievement prediction on the continual interaction of a variety of factors. To know these would not guarantee the cure for the problems of selection, admission and counseling. He facetiously recommended that "those seeking 'The Formula' are urged to consult their favorite palmist or astrologer." 71

Scannell chose to define his terms so that he made prediction of academic success an integral feature of the process of education. He stated that

The identification of students who will succeed in and profit from higher education is of great interest in present American education. Several approaches may be

70 James H. Robertson, "Failing Students Test the College's Belief in Importance of Individual," College and University Business, XXXVI, No. 3 (March, 1964), p. 51.

71 Lehmann, op. cit., p. 934.
and are taken to obtain information predictive of academic success. Advocates of one approach insist that predictor instruments, in addition to yielding accurate predictions, should represent an acceptable definition of the academic goals of public education. This approach recognizes that scholarship and admission examinations in part define the activities of elementary and secondary schools and influence students' attitudes toward what is necessary to succeed.72

He spoke for the logic of this relationship in understanding the purposes of educational endeavor.

However, Bereiter made it certain that he understands the process of prediction and the educational function to be antithetical. He pronounced:

As formulated here, the functions of prediction and of education are opposed rather than complementary. The "prediction" approach consists of measuring the student's most basic and stable aptitudes, temperamental traits, and interests, then helping the student find a field which "matches" these characteristics. What may be called the "educational" approach, on the other hand, consists of measuring those traits that are susceptible to differential change under the influence of curricular experiences and then helping the student find a field which is likely to produce in him the most desirable change.73

He concluded that the irony running through all of educational testing is "to produce changes in people," even though the statistics depict homeostasis.

Fishman and Pasanella countered the ambivalence of the "to know" or "to change" dilemma with their conclusion: "prediction researchers

72 Scannell, op. cit., p. 130.

73 Bereiter, op. cit., p. 7.
should be continually at work to improve their techniques while guidance and faculty personnel should be as constantly involved in reducing the efficiency of these same techniques via special guidance, tutoring, and incentive programs.\textsuperscript{74}

The conclusion of this section of the literature which has been reviewed is that the statistical predictions provide the information on which can be based the guesses of "odds" for students-in-transition, but which should also be used as the goals for faculty to improve their approaches and for individual students to take advantage of for enhancing their own self-improvement.

The next section considers some of the writings which are concerned with the derivation of policies for admissions.

\textbf{Admissions policies}

The following references reflect the interest of institutions in the contributions of research to the development of sound policies for admissions procedures. In the earlier section concerning the importance of the study, mention had been made of Hardee's statement\textsuperscript{75} on the obvious need for systematic research to be utilized in various pronouncements about students and development of programs and policies which effect their academic and personal lives.

\footnotesize
\textsuperscript{74} Fishman and Pasanella, \textit{op. cit.}, p. 302.

\textsuperscript{75} Hardee, \textit{loc. cit.}
Some admissions policies are developed on arbitrary standards of cutoff points employing high school standing, GPA, or testing results. Brickman reported on the effects of the changes in policy for Kent State University in the attempt to improve student performance and general academic quality. Students who had earned less than "C" average in high school studies were deferred to other quarters than the popular Autumn Quarter beginning in 1961. One of his conclusions was, that of almost 500 applicants deferred, fewer than one-third took advantage of the late starting opportunity. The policy appeared to be based on acceptance of "C" as the standard of acceptable high school work as well as employing effects of obstruction; deferment may cause students to reject the institution and consider enrollment elsewhere or not at all.

The commonly employed element in admissions policies is testing information. One of the broader discussions on the use of testing in admissions was presented by Dressel. He counted the reasons for the uses of results from external testing programs in admissions, scholarship awards, placement, and accreditation. The problems of usage involve the fear of standardization of educational programs, inefficiencies, and ethical misuses. He declared that the purpose of testing

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should guarantee "that each individual receive the education which will most fully develop his potential." He recommended that testing be utilized to place and recognize the student but, as well, to reduce the error of judgment with composite information. Professional development should be encouraged and criticism should consequently be expected. He concluded with the following statement:

Where the criteria and the means of appraisal are covert and dependent upon the whims of single individuals, there can be no assurance of justice and no assurance of improvement. Accordingly, the development of more objective means, more widely used means, and more standard means of appraisal are essential to the development of our democratic society. To take any other view is to argue that the errors of which we know nothing are preferable to those which we can identify.78

Super79 called for usage of tests calibrated with college admissions needs so that students could make choices with greater realism of the demands of college study. This usage requires professional qualifications of those who would employ psychological testing.

Hills80 extended his concern about professional sophistication to the development of more precise devices, scales and other predictive instruments. He discussed the contributions and disadvantages of the

78 Ibid., p. 166.
use of profiles of colleges with students as they choose among colleges. He was concerned (1) students would judge the quality of the college from the starting point of the student rather than by the progress of the student, and (2) the average test score of a particular college would be treated as if it were the minimum score. He emphasized that the probabilistic nature of the profiles should be obvious to counselors and counselees; this truism should be apparent to the admissions officials, as well. The element of selection may not be improved by "better guidance" so much as effected by self-selection prior to application.

Super outlined the acceptability of prediction profiles as information to students in their decision-making, a responsible process. He stated:

Thus it is possible to say that very few students of the ability level of John Doe are admitted to Siwash, but that there are many with whom he compares favorably at Podunk. John's choice of college can be considerably improved, and he and admissions officers can be saved time and heartaches by foreknowledge of this kind. If John still wants to take on odds, he can do so knowingly, and with alternative plans in case the probable comes true.\(^{31}\)

This reaction supports the usage of reliable information for the best adaptation by individual students in their goals and purposes. In effect it outlines the range of acceptable usage and signals the limits of such data.

Results of a study by Sharp\(^{32}\) suggested other useful conclusions in relating the background of students to their futures. He concluded that the years of study by a student in a particular subject field had no particular bearing or significant effect in the mark earned in that subject in the first year of college. Level of performance on placement tests held a significant relationship to college grades. He recommended that this is important for counselors and others working with students to consider. The addition of reliable information to the body of knowledge increases the likelihood of more responsible decision-making.

For the benefit of the determination of admissions policies based on psychological data gleaned from careful study of young people, the guidelines below are useful. Super surveyed the implications of goal specificity in the vocational counseling of college-bound students. He stated the following guidelines:

1. For many college-bound students, and for some young adults even after college, vocational goals must be viewed as emergent rather than existent;

2. Counselors need to appraise the readiness of clients for exploratory versus preparatory, for general versus specialized education;

3. The alternatives provided by higher education may be classified, and should be more clearly classified, as exploratory or preparatory, general or specialized;

4. Students should be helped to understand their own needs and the available resources in these terms, and to see how these resources may be used to meet their peculiar needs;

5. The exploratory role of education, and the exploratory purposes of much educational and vocational counseling, need to be made clear to those responsible for planning and supervising educational offerings and opportunities and the related counseling and guidance services.  

These outline broad understandings of greater effect than just for the policies institutions will use for admissions determination. But these have definite implication for this purpose.

A reasonable flexibility in the stringencies of selection policies for admission was urged by Brown and Russell as they concluded their study on culturally disadvantaged youth. They suggested that there was no adequate substitute for becoming thoroughly familiar with the assets of each applicant. They preferred such provisions as conditional or provisional admission rather than rejection. They also emphasized systematic guidance services for these young people. Ignore the testing results and give them opportunities. They recommended due consideration of the merits of each student rather than relegation to a mere statistic manipulated by the computer.

Sgan reported a study of the relationship between test scores and GPA from year to year through college study. His interpretation of his findings impressed the fact that each class along the range of ability contributed graduates to the college. He recommended that the

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84 Brown and Russell, op. cit.

individual exceptions were sufficient to challenge the so-called consistent findings and to keep admissions and guidance counselors from complacency. He recommended the following: "Selective colleges should be big enough to do more than cater to an intellectual elite, and part of the best teaching achievement is to change average-ability first-time matriculants to thinking college graduates." 36

Fishman and Pasanella reported on the development of a "guided admission" approach as opposed to the hyper-selective process. They concluded that institutions more concerned with differential needs of students for several programs of field interest were particularly attracted to the differential model for prediction and admission. They suggested that "this model is also geared toward the educational philosophy which claims to be interested in the particular areas of excellency or insufficiency of each candidate rather than in his 'average' excellence or insufficiency." 37

The study of Siegel and others 38 reported the concern voiced by the faculty of their institution, Miami University, that admission of increasing numbers of high school graduates implied "a gradual but progressive diminution" of the overall quality of the student body. This study should be accepted as evidence about the quality of the

36 Ibid., p. 351.


student performance on academic standards and should allay fears concerning the dilution of academic standards. They recommended that faculty might better rely on more standardized and representational data than internal referants in classroom performance.

Wescoe 89 discussed open door versus selective admissions, particularly with emphasis upon qualities which are important for success in college. As the Chancellor of a large Midwestern university, he supports the open door approach, an advocacy which could hold wider reference. He was concerned with the panic created concerning college admissions and suggested one serious effect was that "selective admissions tends to be equated with the quality of education."90 One of his most dramatic criticisms was the following statement:

Academic selection processes automatically discriminate against the child whose parents are not fond of reading, against the child from a large family, against the child from a small high school, against the farmer's child and the laborer's child, and the child born into an underprivileged minority.91

He supported the process of self-selection as "very much an American tradition" and intimated that the results may be superior in many ways. The institution he represents is regularly noticed as a major "winner" of Woodrow Wilson fellowships. Local reference to the shortage of winners is prefaced by the fact that admissions is open door. Wescoe,

89 Wescoe, op. cit.
90 Ibid., p. 138.
91 Ibid., p. 139.
in contrast, appears to emphasize the effects of self-selection and motivation in combination with institutional stimulation.

In summary, the derivation of admissions policies from studies of academic prediction depends upon competencies gleaned from the fields of education, psychology, and sociology. Research efforts provide evidence for careful planning of general statements of policy so that the requirements of individual persons can be considered. Development of information devices facilitates individual choice-making as well. The conclusion of the studies and authoritative statements in this section is that students will learn and thrive if adequate educational opportunities are provided to them. The major implications for implementation of these probabilities rest with action by faculty members.

The following section reviews studies and reports which apply more directly to policies for educational and guidance activities.

Education and guidance policies

This section will review effects of studies and commentary concerning the implications for educational and guidance policies and practices. It is particularly important to treasure the philosophical bases which underly the educational system and to employ these purposes wisely and consistently. It has been pointed out by Fishman and Pasanella that the wider interest of persons from various fields in the philosophical and empirical problems of admission is a welcome addition. These will help to broaden the contributions of psychology and sociology with education. They decried the advancement of operational routinization without consequent "consideration for the criteria
or the educational-societal goals upon which selection and guided admissions must rest." They hoped that "the new influx of intellectual forces in this area may reduce this imbalance by anchoring selection and guided admission in the philosophy of education at one end and in social-science theory and methods at the other." 92

A statement on the need for intelligently devised and effectively administered procedures for minimizing and salvaging failures was offered by Robertson. His remarks might appear to represent concern developed in the situation of a large, relatively selective Midwestern university. He stated that the increasing attention given to refined selective techniques may cause a loss in concern for the individual student. He recommended that intelligently devised salvaging procedures for failing students ought to be devised not only for the students affected but for the health of the institution itself. He recognized that failure occurs but recommended that

It needs to be recognized not as a stigma, not as a statistic, but as an occasion for a dispassionate review of the causes and for custom-built consideration of remedies. Each student is entitled to the best insight and advice the college can provide. This means a chance for a timely, personal interview with a responsible, knowledgeable member of the college staff in which the factors are analyzed and the alternatives weighed. 93

He contended that the standard system of treating students alike for this condition is not appropriate, but that selective circumstances

92 Fishman and Pasanella, op. cit., p. 308.
93 Robertson, op. cit.
must be involved. He even concluded optimistically that "frequently, those brushed by failure develop into more mature, productive, and responsible students and more dedicated and generous alumni than do some of their untempered classmates."94

The development of effective policies for educational concerns must derive its rationale from the contributions of effective research, such as those cited previously. Cook and Martinson95 studied the relationship of certain high school coursework with college achievement, a frequently studied area of interest. Their conclusions were similar to nearly every other study in this area, that no clear relationship exists between actual content and breadth of subjects completed and college success but with the level of performance in that that has been studied. They concluded that an "aura" arises over the so-called college preparatory subjects so that the student is conditioned to think that he "needs" these in order to succeed in college study. Students should be helped to plan their courses that will best meet their needs educationally and vocationally. They also concluded that colleges should put less stress on the pattern of coursework completed and more on the quality achieved. These research data will provide more than observational and authoritarian viewpoints to the development of smoothly appropriate educational policy.

94 Ibid.

The transference of these comments to the development of guidance policy and practices hinges on the smooth functioning of roles and the interplay of research data. Howard\(^96\) provided a well-stated comment on the interaction of selective processes and guidance activities. He outlined the role relationships of various professional people dealing with selection of college students or industrial personnel in conjunction with those doing vocational and educational counseling. He reasonably concluded that those responsible for selective processes generally conceive of dealing with all those with a specific score, while the counselor is concerned with the situation of the individual person. He conceded that

> It is probably easier for the counselor with his individual cases to take into consideration other determinants of success which are not included in the aptitude tests and which are actually contributing to the lack of perfect correlation between the aptitude test and the success criterion.\(^97\)

He concluded that the "one doing personnel selection must and can set a cutoff point; the one doing counseling must not and cannot set a cutoff point."\(^98\) Herein lies the dilemma of selection versus guidance.

Mathewson discussed the ideographic-nomothetic issue in his arguments about the concern for manpower or persons. He exclaimed that the counselor should give up his concerns of advising, directing and supporting and "affirm his commitment to the individual."\(^99\)

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97 Ibid., p. 728.

98 Ibid.

circumscribed the domain of the counselor as primarily concerned with personal needs and not institutional or social ones. He indicated that the counselor is concerned with educative and interpretive functions and not selective, placement or recruitment purposes. He neatly pinpointed the continuum of individual versus institutional concerns with the following interpretive versus ipsative contrast: "... the anarchy of ill-considered and uninformed individual drift..." on the one hand versus "... the tyranny of virtual dictation of decision on the other..." He affirmed the usefulness of informed self-direction so as to insure individual freedom, even though some inefficiency may result in "some wastage, some shortage, and surplus from time to time." 100

The following were succinct statements of his philosophy:

Unless each individual believes that opportunity exists for him, that challenge is confronting him, that effort on his part will have some personal meaning--no programs, no procedures are going to bring us social salvation.

... .................................................................

Opposed to the development and utilization of workers as mere socio-economic units in a technological state is the fundamental spirit of the American dream that each one can form, and make good, his own self-identity, consistent with social and moral values. It is not utilization of manpower resources to which we are committed in our country but rather to the development of free, self-directing persons. 101

100 Ibid., p. 342.
101 Ibid.
Concerning the effects of counseling on the effectiveness of the plans and experiences of students, several studies were located. Eels reported on the differences found in a study group who were given voluntary versus compulsory counseling in connection with their plans for college. No difference existed in the intelligence results for these students. One finding was that for the lowest-quarter group, those who sought additional counseling than that required for purposes of admission, were more likely to change their plans about seeking admission to the college. No significant differences were found between the two groups in their academic success after enrolling in the college.

Watley surveyed the performance and characteristics of students in engineering programs on a scale of confidence. He concluded that students who were low in confidence were characterized by oversensitivity, compulsive behavior and social withdrawal and were more likely to drop out of their study programs still in good standing than were more confident students. He suggested that "counseling of a supportive, encouraging type might have helped in enabling doubtful students to perceive their situations more realistically." He


104 Ibid., p. 596.
favored a directed approach to individual relationship with less confident students to help them discover their capabilities and develop a more realistic understanding of themselves. He hoped that less wastage would be the result.

These references have reflected the emphases on educational and guidance policies and the philosophical and empirical rationale for determination of them. The effects of practices by counselors and teachers can be observed in full respect of the possibilities for growth and learning presented by individual students. The burden of proof in education is the determination of effects of teachers with their students. The concluding section of this review of the literature on the problem of the study covers those citations on the transfer student.

Transfer students

Actual studies of transfer students were few and of relatively recent vintage. Most reflect institutional self-interest. The underlying impression of the transfer student is one of wasted shame. A counselor writing in The School Counselor advocated a curative approach for success in college. She suggested that the importance of the problem was to be cited in the increasing pressure and panic of students and parents. She felt that "the sad and sometimes shocking result for many academically well-prepared students is needless 'dropping out' or 'transferring.'"105 So, the conclusion was operating that it is a sad

and shocking event to transfer from one college to another. Little if any concession existed in this statement for the likelihood of positive self-determination in the effective transfer from one institution to another to continue a planned sequence of educational activity.

Of course, junior and community colleges are geared to the proposition of providing a two-year program for students. Therefore, it is necessary to transfer on to advanced standing if additional course work is to be completed. An estimate of the incidence of this transfer rate was provided by Medsker; he indicated that three-fourths of the junior college students in his study were prepared for transfer but that only one-third of them actually effected the transfer. The preparation of students with reliable information and strong achievement skills seems to be the major task of these institutions. Wise and Gummere employed data gathered by members of A.A.C.R.A.O. in 1959. From these they estimated that there were about 185,000 transfer students of whom fewer than 30 per cent were transferring from junior colleges.

Gummere has contributed a treatise on the transfer of college students, characterizing them as America's wandering scholars. He did not operate from much research evidence, but reported some data in the


108 Gummere, *op. cit.*, pp. 73-76.
form of experiences and opinions of predominantly Eastern colleges. He introduced the proportion of 20 per cent of all "new" students were transfers. He quite rightly indicated that these "nomads" cause discomfort and worry among college officials, some of whom are morally offended by the "vagrants." He opined that the conventional official view of the transfer is unfavorable, and that "this drifting still seems inefficient and even a little immoral." Jefferson has characterized him as an "academic leper." He should choose Alma Mater carefully and stay to earn his baccalaureate degree. "Easy transfer might encourage irresponsibility." The transfer group is embarrassing to the officials of an institution, an implied criticism of the forsaken place and probably of the next place for taking in "academic flotsam." The group of the transfer students who are judged to be morally satisfactory are from the junior colleges, but he reported that these are only one-fourth of the entire group.

Gummere's contention is that he and some other admissions officers and teachers "believe that the student who hits the academic road may be pursuing a sound educational goal." But he challenged the possibility that some think the transfer is a better risk than a freshman with the following questions:

1. But do transfers actually improve after switching?
2. Do they get what they want by transferring?

109 Ibid., p. 75.
3. How does their shuttling around affect the institutions involved?

He suggested that, instead of drifters, they be designated as seekers for that which does not exist: "... a college such as we describe in our catalogs." He cited the reasons for transfer to include persistence, love, money, curriculum, and boredom but also intellectual stimulation and educational specialization. He concluded that if geographic mobility is characteristic of our society, then "some academic mobility probably must go with it. If, in addition, transfer had educational value in itself, our wandering scholars could be a rich asset, not only bettering their own studies but cross-fertilizing the academic garden." His literary essay was prepared for popular consumption but has reference for institutional and inter-institutional research efforts.

The study authored by Iffert is the most detailed presentation on the follow-up of migrating college students. The population of 13,700 men and women for this detailed study entered college in the fall of 1950 and was followed through 1954. He reported that institutional differences caused classifications to be made but that the single unit was still significant unto itself and unlike any other. His data

111 Gummere, op. cit., p. 73.
112 Ibid., p. 74.
113 Ibid., p. 76.
114 Iffert, op. cit.
indicated that fewer students were likely to transfer from private independent colleges. He found that 12.0 per cent of the study group transferred to another institution with a slightly larger group moving to larger institutions. At the end of the four-year study period he reported that it was known that one-fourth of the transferred group had been graduated, contributing to the total estimation of 60 per cent of the entire group who eventually were graduated. He stated that students' withdrawal reasons were not so much associated with dissatisfactions as with lack of willingness or inability to accommodate the dissatisfactions. Nearly forty per cent of the transfers had been effected before fall of the second academic year; less than one per cent transferred during their senior year. Earliest transfers were from technical colleges and teacher-training colleges. He did point out the dependence upon college graduation as the criterion and the trick in assuming that college attendance only had lesser or no value only. The prediction for graduation increased to about 68% chances per 1,000 for college juniors. He concluded that reasons for withdrawal generally reflected upon the individual students rather than the institutions. It has become an out-of-date study which should be adjusted by the effects of larger student population, changes in colleges and universities, college admissions procedures and guidance practices.

Jex and Merrill have reported numerous studies conducted at their Western university. One related to the problem of this study concerned a study in persistence of students which analyzed withdrawal
and graduation rates. From the premise of greater efficiency in the high rate of retention of students, they reported on dropouts from the university. A limitation of their data was that many students were known to transfer to other colleges, "but the extent and nature of such transfers is so little known, that it cannot be adequately documented here." They conjectured that

If we may assume a transfer rate of 12 per cent (the estimated national average) and further assume that about 40 per cent of these transfers have since graduated from other universities, the total graduating to date approximates 50 per cent. Since most of our past thinking about graduation rates has been in terms of those graduating on schedule, we have been only "half-right" concerning the "long run." They reported that reasons given for transfer "related mainly to general dissatisfaction; wanting to be nearer home town; having completed pre-professional requirements; lack of interest in studies; wanting to attend a less expensive or different sized institution." They concluded that a major shift in viewpoint was from the "dropout" from college to the "interruption" of academic ambition. They reported that most previous studies "seriously underestimate" the persistence of students, who would combine adult responsibilities with the


116 Ibid., p. 762.

117 Ibid., p. 764.

118 Ibid., p. 765.
adolescent status of the student. They stressed the value of longi­tudinal study to determine the eventuality of college graduation; they extrapolated their data to suggest that the Class of 1948 would eventually show a rate of 60 per cent graduation from college. The concept of "interruption due to military service, economic need, marriage, and interest shifts," indicates that students are meeting the long-range challenge of education and advanced training. They predicted that by 1975 the residual dropouts would likely be the in­ competent students.

Once again the "prophets of gloom" about the waste of talent in our society err; the growing importance of specialized professional training in our society is being met by a tide of students who overcome great challenges to complete this training over a long period of time. Perhaps the universi­ ties can modify and "mature" to meet the challenge of a "mature" student body.119

Commentary on this study complimented the study for its frank reporting of findings in clear and definitive terms and supported the practice of institutional self-study.

A recent report by Cooley and Becker120 from the copious data of Project TALENT analyzed the normative picture of the junior college student compared to his non-college and college counterparts. They concluded from the ability measures and socioeconomic cultural variables of more than 35,000 males and females that junior college students

119 Ibid., p. 767.
resemble non-college students more. They also reported the over­
lapping distributions indicate that approximately one-third of the
junior college students placed below the mean of the non-college group
and a third were above the mean of the college group in measures of
ability. The cultural variables of most weight were mother's and
father's education, father's job and number of books in the home.

But the policies and patterns into which students must subject
themselves seem to be increasingly difficult to understand and inter­
pret. Dressel contributed a statement on this point: "Even now the
difficulties attendant on placing a student who transfers from a
community college program of the terminal type to a four-year program,
are sources of increasing difficulty." He also commented upon the
problems of accreditation and included the fact that these provide
no real assurance of the quality of the actual program.

Arbolino recently discussed this in his report to the College
Entrance Examination Board on the newly-formed Council on College-Level
Examinations. The initial concern has been the determination of placement
level and credit by examination, but also reflects on the de­
cisions concerning this for individual students and institutions. He
indicated that the project would deal with the problems of movement,
accessibility, and identification, or transfer, placement, and credit

121 Dressel, op.cit., p. 164.

122 Jack W. Arbolino, The Council on College-Level Examinations
by examination. One of the prime needs for the information of this
council was to facilitate the movement of transfer students within the
system of higher education. A preliminary plan is to provide general
guidance services which would help transfer students as well as special
or unaffiliated students. Arbolino reported that the junior colleges
were not so interested in the adoption of these comprehensive tests in
the fear that colleges might require validation of two-year transfers;
in preference these colleges choose motivational and guidance tests.
He concluded that the educational need was easily discernible, that it
included the "problems of access to higher education, mobility, indi-
vidual development, and the utilization of human resources." Much
of the preliminary work leading to the formation of the Council was
provided in an unpublished study by Irish. This material indicated
prime emphasis needed to be given to planning for the articulation of
junior college students. This was so because more junior and community
colleges were being established; students from these must transfer to
further their studies; and four-year colleges accord each other "parity
of esteem" through accreditation and credit recognition not necessarily
granted to junior colleges.

The outstanding extensive work in analysis of the transfer of
junior college students has been reported by Knoell and Medsker
\[125\]

\[123\] Ibid., p. 23.

\[124\] Lois D. Irish, "The Need for College Transfer Services,"
(College Entrance Examination Board, New York, N. Y., September 21, 1962), 23 pp. (mimeographed)

\[125\] Dorothy M. Knoell and Leland L. Medsker, From Junior to
in their national study of transfer students. The group of more than 7,000 from 345 two-year colleges were surveyed as they moved to 43 senior colleges and universities. They reported that very little is known about mobility of students after they enroll for the first time in a college. Their extensive study reached unexpected conclusions because anticipated variability in student characteristics was not found. They reported that "as the junior college freshman class is almost indistinguishable from the high school graduating class, so is the junior college transfer group like the native student population found in the four-year colleges."\textsuperscript{126}

They also concluded that it was a reasonable estimate that at least 75 per cent of those who transferred from junior colleges will eventually receive their baccalaureate degrees. This was derived from the facts that 62 per cent were granted their degrees within three years after transferring, that nine per cent were still enrolled in their fourth year, and that the additional amount would be met through those who transferred to other institutions or who had dropped out and who planned to re-enter. In general, their findings indicated that

1. attrition among transfer students is greater than among native students.

2. transfer students do somewhat less well than native students during their first semester after transferring to the four-year institution.

\textsuperscript{126}ibid., p. 18.
3. by the end of the senior year, the grade averages of the transfer students are approximately the same as those of native students.

4. a smaller percentage of transfer students complete their undergraduate degrees within four years.

They concluded their report that the problems of articulation for the transfer students must be shared in interdependent attitude.

The example of an exercise in institutional self-study is the dissertation by Young who surveyed certain factors related to academic performance by transfer students admitted to an Eastern university. With an "N" of 453 male and female students admitted with advanced standing in Fall 1961, he reported the effects of numerous factors on academic performance. His findings reported that the transfer student generally earned lower marks after transfer, although the average GPA was comparable to the campus average. Females appeared to be better risks, although they met higher standards at the point of admission; females had to have a 2.50 GPA at prior institutions and males a 2.00. According to type of curriculum entered, three classes were formed: science majors, non-science females, non-science males. Science majors scored higher on aptitude indicators, but science majors and non-science females showed no significant difference in index of change in achievement. He reported that separate prediction equations

\[127\] Young, op. cit.
were developed for all three groups and considered that non-science males might be required to have a higher GPA than others applying for admission. No particular relationship existed with age as the factor, although the older student might be given less preference than a younger student with a similar average. Generally, students from junior colleges achieved lower than those from other types of colleges, leading to the conclusion that closer scrutiny be given their applications. Prediction equations with varying weights for factors in each class of students would provide the most definitive selective bases. He concluded that the next effective procedure would be using a local aptitude examination with a cut-off point at the 50th percentile. This procedure would "eliminate many of the students whose grade point average will decrease greatly." The other factors, such as residence and social affiliation, held some relationships of interest but with generally low weight. The factors of age, sex, type of institution, and level of academic aptitude were found to be important factors in the variable regression equations, although the former method employing the untested criterion of 2.00 for males and 2.50 for females was judged to be fairly successful.

In an article he had prepared from his study, Young reported the following conclusions:

That it is feasible to require transfer students from junior colleges to meet a higher admission standard, possibly a 2.5 grade-point average. There would also

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123 Ibid., p. 66.
appear to be some merit in having all applicants with advanced standing take either a locally or nationally standardized aptitude examination. 129

Confirmation of Young's finding on junior college students appeared to be provided by Knoell and Medsker in their conclusion that

A very clear implication from the findings is that a junior college average of only C should not be regarded as adequate and sufficient evidence of a student's ability to do satisfactory work at the upper division level at all institutions, even in the public sector of higher education, nor in all major fields. 130

They further indicated that some particular institutions could provide a successful academic experience to some of these average prospects. Irish 131 contended that junior college students were subject to less effective or no guidance efforts during secondary schooling. Inadequate guidance contributed to students' uncertainty about educational and vocational goals. Her contention was verified by the observations of junior college counselors who reported that students had received little or no information about two-year colleges. They characterized these students who eventually must transfer on to be the group in the middle with the four-year college-bound student on one end and the less able vocational-seeking student on the other. It is probable that current efforts emphasizing the various post-high school

130 Knoell and Medsker, op. cit., p. 40.
131 Irish, op. cit., p. 3.
educational opportunities have begun to alleviate the incidental system she described.

The facts of the reports and studies which have been cited above suggest that little general study of the problem of the transfer student has been done. The problems of control and follow-up of the data are tremendous. The facts suggest that increasing attention will need to be paid to research efforts to provide the information which will assist the careful preparation of guidelines for policy determination.

In summary, the transfer student is represented to be somewhat slower in acceptance of his educational pattern and possibly to achieve at a somewhat lower level, although enough exceptions are available to challenge complacency with policies of generalities. Those who support the contributions of the transfer student seem to outline the problems of guidance and successful articulation; opponents to the necessity for transferring recommend higher hurdles and restrictive criteria. The consensus of the literature is that this is a definite area of problems concerning students in their educational careers. Most agree that much improvement in the process of transferring should be undertaken.

The following major section of this chapter is concerned with a survey of research on the testing instrument employed in this study.
Research Relevant to the Instrument

This section refers to the evidence that is available on the instrument used in this study. The material reports on the American College Test (ACT) as the instrument employed in the studies. The description of ACT is provided in Chapter III under procedures for the study.

ACT in the literature

The newness of the ACT Program precludes much implementation in the literature of the battery and data from its study. However, more is becoming available, either in the professional literature or in current studies, often of institutional nature.

Tiedeman\textsuperscript{132} reviewed ACT in 1965 and composed his opinions on the validity of the instrument. He was persuaded that ACT met its stated purpose to function as a basis for college selection based on the skills required of students. He thought that the composite score gave as good indication of scholastic aptitude as was claimed. As a representative of an institutional user of competitive information, he seemed to indicate his bias in stating that the admissions officials might feel more comfortable if they knew, indeed, that the relationship of the ACT and SAT was high "on the order of magnitude of the reliability coefficient of the SAT in fact."\textsuperscript{133} He questioned that

\begin{itemize}
    \item \textsuperscript{133} \textit{ibid.}, p. 818.
\end{itemize}
the scores should be reported indiscriminately to institutions at the request of the students and indicated that colleges should not have to deal with students on the strength of this bit of news.

Some interest is shown in developing tables of comparable scores for these common tests. Sassenrath and Pugh surveyed the relationships of ACT and SAT to determine the effectiveness of their predictions. In two study groups of 80 and 708 students at Indiana University, the authors found high relationship between ACT and SAT with correlations of .80 and .86, respectively. They concluded that the predominant loading was verbal and that ACT English and SAT Verbal contributed the greatest weight to the regression analysis. Utilizing the verimax rotation, they reported that two predominant factors, verbal and quantitative, accounted for about 75 per cent of the contributions of each of the subtests. They concluded that the tests showed similar results and therefore warranted the development of conversion tables. They also suggested that one or two good 45-minute tests of a verbal nature might provide the information needed rather than a multiple test battery.

Chase and Barritt further substantiated the high relationship of the college ability tests in their development of concordance tables.

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tables utilizing ACT and SAT in conjunction with an anchor test, a locally compiled battery. If one or the other score should be available, then additional handling can proceed by comparison of that value with the table for comparative standing. With large samples of more than one thousand their study showed correlations of .84 for men and .85 for women of ACT and SAT with the anchor test. They recommended the use of their comparative device with caution to other applications.

Brown and Wolins in a study completed at Iowa State University reported that so little had been published on ACT that the evaluation process by users of the information was hampered. Their study sought to determine the predictive results for first-quarter GPA for freshman students in each of three years. High school performance was generally indicated to be the best predictor with variations among college and sex groups for other factors. With heavy mathematics and science emphasis, the mathematics ability indicator predicted best. The composite of ACT was the best predictor in three instances, particularly in home economics. High school grades plus ACT composite gave as accurate prediction in multiple correlations as high school grades and the best test of the battery of items. These results allow a prediction to be made at the time of application. They concluded that at least in one institution ACT was as good a predictor of success in college studies as other aptitude indicators. Their

major criticism of ACT was its expenditure of time and that it showed no more incremental validity than other tests. The three-and-one-half hours spent with ACT seem to have been replicated in another test lasting one hour at Iowa State. In the varying contributions of the subtests the authors reported that these were more helpful for the lower and middle groups but not so effective with the highest group, as with engineering students. The authors seemed particularly concerned that the tests did not appear to have differential validity.

A comment from another source appeared to refute the latter conclusion and to support the interrelationships apparent in the subtests of ACT. Michael challenged the limitations of pure factor tests in the performance of tasks involving simultaneous use of several abilities. In tests of interactive factors the measured abilities can be expected to be complex in relationship as in complex performance of the criterion tasks. It is suggested that his point is supportive of the relationship of the subtests of ACT.

Johnson studied the validity of comparing subtest scores to indicate clues for differential abilities. He pointed out that the moderately high reliability of .35 for median correlations and rather high intercorrelations with median of .50 that the interpretability


of these scores of difference was limited. He concluded that the difference between standard scores must be six or seven points to represent true or stable differences, not resulting from chance. He recommended that interpretations should be supported by other information about the student. But he indicated that one or two differences of significant proportion might be expected to occur for anyone's results.

Another Midwestern survey of the ACT was carried out at Kansas State University in three studies reported by Foster and Danskin. They affirmed that very little data about ACT were available in the literature. The first study analyzed the relationships between first semester GPA's and ACT alone and also with high school rank. The multiple correlations of ACT subtests with and without high school rank ranged from .60 to .70 for the male group and from .63 to .81 for the female group. When these results were compared to those customarily reported, the authors decided that ACT, with and without high school rank, was effective as an estimator of college success. Their second study reported the expected GPA and the actual GPA. This cross-validation study reported R's ranging from .54 to .75. They concluded that changes in the mean scores from year to year suggested that new equations should be developed every three years. Their third study reported on the relationship of ACT with selected freshman courses. The

multiple regression analysis incorporated the ACT subtests and high school marks as estimators. The multiple correlations were reported to be about as high as could be expected, about .60 with the three exceptions of speech, calculus, and accounting. They concluded that no one variable accounts for a student's achievement in any one course and that the apparent variable may not always be so significant in estimating course success. They reported that ACT English was more significant in predicting success in calculus than ACT Mathematics.

The authors again emphasized the recency of the instrument and that so few validity studies had made their appearance in the literature.

Jones\textsuperscript{140} reported a study at Miami University which employed the Pre-Engineering Ability Test (PEAT) and ACT. He found that PEAT predicted as well as ACT for first semester marks and for chemistry and mathematics marks. For 68 male subjects in pre-engineering field, he reported the relationship with overall marks and ACT of .645 and with PEAT of .614. The mark in chemistry was predicted by ACT with a relationship of .720 and by PEAT with .637. In mathematics mark prediction the relationships with ACT and PEAT were .426 and .523, respectively. It appeared that the overall results of ACT which were generally available were as predictive, if not more so, than a specially-administered testing instrument.

Most of the additional literature concerning ACT has been generated from the offices of the program itself. It appears that an

openness to research is somewhat more apparent than with competitors in the scholastic ability testing field. Albeit, not all the ACT reports are extensions into depth of the worth of the instrument so much as broad expansions of the information collected in the program. The first report dated March, 1965, was entitled "A Description of American College Freshmen." The American College Survey was administered to 12,432 students in 31 colleges to describe further the freshman classes, to serve as a pilot study for later ramifications, and to develop assessment techniques to be incorporated into ACT. The study reported on the vocational aspirations, educational ambitions and goal expectations of students. The general conclusion supported the variability among the nation's colleges pertaining to attitudes, outlook, traits, interests, goals and intellectual capacity of individual students. And yet a high degree of satisfaction with their choices of colleges was reported for the students in the face of the dearth of reliable information about colleges. The report concluded by affirming the necessity of performing longitudinal studies of achievement and development of students to be able "to separate the real institutional effects from the folklore about colleges." The goals and values of institutional manipulation must be clarified by the ethical responsibility to students.

142 Ibid., p. 62.
Holland and Richards prepared the second research report entitled: "Academic and Non-Academic Accomplishment: Correlated or Uncorrelated?" The sample of 7,262 freshmen from 24 colleges was studied on scales of ACT, extracurricular achievement and high school marks. The correlations between these facets of accomplishment were generally negligible with a median of .04. The complaints or limitations of forerunning studies were answered in this report with its large population and unrestricted range. Academic potential then appears to be one of several dimensions relatively independent. They concluded that past mistakes should not be continued and that the several measures of accomplishment should be utilized.

The report by Munday surveyed the comparative predictive validities of ACT with two other tests of scholastic aptitude, the SAT and SCAT. Overall GPA in the freshman year and specific course marks were incorporated into the predictions. The multiple correlations were computed and by statistical maneuver converted by Fisher's $z$ procedure so that the mean $R$ reported was .44 for ACT and .42 for SAT. In comparison with SCAT the mean $R$ for ACT was .53 and .49 for the other. The tabular data reported that ACT bested both tests in a

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143 John L. Holland and James M. Richards, Jr., "Academic and Non-Academic Accomplishments: Correlated or Uncorrelated?" ACT Research Reports, No. 2 (April, 1965), 26 pp.

144 Leo Munday, "Comparative Predictive Validities of the American College Tests and Two Other Scholastic Aptitude Tests," ACT Research Reports, No. 6 (August, 1965), 14 pp.
majority of studies. The variance from college to college suggested that the specific validity should be determined for each institution. Because of the differences for subject fields and sex groups it was recommended that complex universities should develop several equations of predictive information. The conclusion of the report was that differences in the competitive programs were not to be found in their predictive validities; both appear to do the same task as well as the other. The choice for the spread to be employed could then rest on the various services of the complete program, such as reports to the student, analyses for the college, costs and convenience.

Hoyt and Munday\textsuperscript{145} reported a study of the effectiveness of the prediction of ACT in junior colleges. They reported that there were unique differences among the many junior colleges in the potentialities of their student bodies but that typically they were somewhat lower than their peers in four-year colleges. For the total number of 24,549 students the mean Composite was 18.0 for the ranges of 85 junior colleges compared with 20.5 for four-year colleges. They concluded that ACT had highly acceptable validity for predicting academic success in junior colleges. This, they recommended, lends itself to manipulation for devised educational purposes.

\textsuperscript{145} Donald P. Hoyt and Leo Munday, "Academic Description and Prediction in Junior Colleges," \textit{ACT Research Reports}, No. 10 (February, 1966), 20 pp.
Other studies reported on students with different choices of major field and different vocational choices. Hoyt reported a review of the literature on the relationship of college marks and achievement in adult life. Two other reports undertook a description of junior colleges by discrete analysis to ascertain their differences with other colleges on the bases of image and regional variation. Another report analyzed student reasons for choosing the colleges.

The ready availability of the series of research reports and the quality of the reporting demonstrates the eagerness of the ACT Program to employ scholarly standards. Not all of the reports have


147 Clifford Abe and John L. Holland, "A Description of College Freshmen: II. Students with Different Vocational Choices," ACT Research Reports, No. 4 (June, 1965), 51 pp.


been peculiarly ACT in orientation but are effective in outlining the problem limits of evaluation in higher education. The challenge is intellectual and professional.

This chapter has reviewed the literature on academic prediction, admissions policies, guidance and educational policies, transfer students, and ACT to provide a systematic critique in an adequate manner. The next chapter outlines the procedures which were employed in this study.
CHAPTER III

PROCEDURES, DESIGN AND METHODOLOGY

This chapter describes the procedures which were developed for the study of transfer students followed by the design of the problem and the research methodology.

Definition of the Study Group

This study undertook the survey and analysis of students admitted in 1964 to The Ohio State University with advanced undergraduate standing. The criteria for inclusion in the study group were (1) admission to OSU during 1964, (2) candidacy for an undergraduate degree, (3) completion of ACT within last three years, and (4) completion of at least one quarter of study at OSU.

From the nearly 5,800 applications processed by the Advanced Undergraduate Section of the Admissions Office for the four quarters of 1964, more than 4,000 were accepted for admission. The total group was depleted by nearly one-fourth who did not enter the University and by lesser proportions for those who had been admitted with a baccalaureate degree, former students of the University who changed to other colleges, special students, and those who withdrew after completing registration. Those remaining for the study group were defined as students who had started college studies elsewhere and were admitted
to pursue a degree program, but had not already earned a degree. The total group was 1,273, representing all who met the admissions and registration criteria and completed the first quarter. From this group only those who completed the third quarter qualified to be studied in that subgroup; they numbered 856, nearly two-thirds of the initial group.

Selection of the Data

The selection of the data for this study was guided by the review of the literature and the most commonly discussed factors in conjunction with those which were available in university records. Those data reported by both schools and colleges were utilized. Generally the data employed were quantitative and cognitive in nature. This fact represented the data which were available for the entire group and which had been employed during the application process.

Name, address, date of birth, and factors for determination of residence formed the major portion of the application material. The educational career of the student was outlined, including high school and colleges attended. Other required credentials pinpointed the student's academic career, his relative standing, and other information, including testing results. Official transcripts from high school and colleges were required which indicated that regularly reliable information was reported. No personal information, including work experience, military service, or family responsibilities, was submitted routinely. Correspondence and personal contacts provided any that was known during the process of admissions.
All students included in the study group had completed the ACT within the last three years. This time period coincided with the policy of the Orientation and Testing Center. For many applicants the testing information had been utilized in the admissions process. For a larger group it was utilized in placement testing requirements as well. All undergraduate students had been urged to complete the test if it had not otherwise been required; many did so. The testing was completed on a residual basis at the Center, one of the largest users of ACT in this manner in the country.

Information on the former colleges attended was included as was best available. Each student was considered to be from a single college primarily, either the most recent or the one at which most work was completed. This college was identified by the U. S. Office of Education classification system, a four-level approach including the junior-community college, the baccalaureate-degree college, the master's-degree college and the doctorate-degree college. In addition, commonly-attended Ohio colleges were identified from a sorting of more than 500 admissions records. Nine colleges were identified in this manner: Bowling Green State University, University of Cincinnati, Cuyahoga Community College, Fenn College (The Cleveland State University), Kent State University, Miami University, Ohio University, Ohio Wesleyan University, and Wittenberg University. The number of colleges a student had attended was also tabulated and entered into the data.

Added to these from the admissions process were the beginnings of the student's academic record at OSU. Hours attempted, credit
points earned, and the point-hour ratio for the first and third quarters gave indication of the student's standing on the academic scale. Each in the study completed the first quarter; some continued within the time span of at least one-and-one-half calendar years to complete the third quarter, the equivalent of an academic year.

For the study group it was decided that these measures of the quantitative performance included most available items which would be both applicable and interesting for descriptive purposes.

**Description of ACT**

The American College Testing Program (ACT) is the more recent addition to the field of scholastic aptitude testing for purposes of college admissions. In competition with the Scholastic Aptitude Test of the College Entrance Examination Board, the ACT was first made available in 1959. The ACT provided national testing information with some comparability developed for other tests with similar purposes. Norms are available for various groups of student classification. Information is provided for students and their parents, schools and colleges. ACT has injected a competitive element into the picture of national testing programs. The "lower-priced spread" provides services to schools, colleges and students concerning the abilities to do college-level work as represented by test performance.

The ACT has its foundations in the Iowa Tests of Educational Development. From initial data of an Iowa school population concerned with the conversion of raw score data into standard score system the
ACT Program took its lead. Scores are provided for four subtests—
English, Mathematics, Social Studies, Natural Science—and the
Composite, an arithmetic average of the four subtests. The scale of
standard scores decreases the significance which might be attached to
raw score differences of trivial magnitude. A standard score of 1 is
the lowest reported and 36 is the highest. A score of 16 is the approxi-
mate median score for high school seniors, whereas for the college-
bound group the median is 20. The standard deviation of the score
distribution is approximately 5. The national percentile ranks for
802,080 college-bound high school seniors is included in the Appendix.

The reliability of ACT has been reported in the Technical
Report through various methods. Indications of internal consistency
range from .32 to .90 for the single tests to .24-.96 for the com-
posite score. Tests for standard error range from 1.45 to 2.57 for
single tests with a range of .96-1.12 for the composite score. The
results were based on measures of odds-evens procedures. One study of
parallel forms was reported in the manual with the corrected retest
reliabilities ranging from .76 to .87 with the coefficient for the
composite of .92. With a long-term retest experiment the coefficients
ranged from .67 to .34, which were called reasonable and predictable.
Intercorrelations between subtests were reported for a random sample

\[^1\text{ACT Technical Report, 1965 Edition (Iowa City, Iowa: American}
\text{College Testing Program, Inc., 1965), pp. 15-17.}\]
of 93 colleges participating in the program. These results showed that the tests were moderately intercorrelated, but that the range of the figures for the individual colleges indicated the differences between colleges. Median correlations ranged from .45 between English versus Mathematics to .65 between Social Studies versus Natural Science.

The validity of the tests was reported to indicate the student's abilities and skills needed to succeed in college-level studies. Interested parties have been invited to investigate an out-dated battery form to determine content validity. No item analysis has been accomplished, except for a study by Collins which undertakes this analysis on the cognitive-affective scales of intellectual hierarchy. Studies of predictive validity have been regularly employed for individual colleges in the program. Median correlations in these studies range from .37 to .50 for the five test scores. Multiple correlations for the four tests in combination against departmental and overall achievement showed a median range from .42 to .53. A multiple regression analysis resulted in the formation of two indices from the four test results (T) and the self-reported high school marks (H). The average of the two indices is called the TH Index. Median correlations for the TH Index range from .52 to .64, a substantial increase in predictive validity. The validities for subgroups arranged by sex and

\[ \text{Ibid., pp. 16-21} \]

curriculum ranged from .42 to .70. The validities in specific courses ranged from .36 to .65.

The comparability of ACT and its relationship to recorded achievement indicates that it offers worthwhile information for the process of college admissions. The research programs of ACT of a developmental and predictive nature substantially supplement the basic data. Much information is provided which requires professional competencies for careful and fullest usage.

Collection of the Data

Basically the data were available from the records of the Admissions Office, the Office of the Registrar, and the University Orientation and Testing Center. The cooperation of these agencies was secured for the collection of needed information.

The initial phases of the collection of data were begun in the records of the Admissions Office by surveying complete evidence of admissions for each quarter of the year 1961. Eliminated from these records were those who held degrees or had been admitted on another basis than intent to earn an undergraduate degree. The records were compared to lists in the Office of the Registrar which indicated those who had paid fees in their initial quarter of admission. These remaining records were then compared with credentials for admission on file in the Admissions Office from which the information on former college academic standing, identification of the college, number of former colleges attended, and high school rank decile were determined. Some
of the missing high school ranks were determined from college office records, although these were not available for 241 students.

With these records it was then resolved that each student included in the study had completed the ACT. The preponderance of the results were gained from the residual testing program of the Orientation and Testing Center. A minority of the scores were reported by the high schools or from the ACT Program directly. No results were older than three years before the quarter of admission. The standard scores of the subtests and the Composite were utilized. From the test score work card other identifying data were available: student number, date of birth, college of enrollment, class rank, sex, quarter of admission.

The following colleges and schools of OSU were included in the study:

- College of Agriculture (AGR)
- College of Arts and Sciences (ART)
- College of Commerce and Administration (COM)
- College of Education (EDU)
- College of Engineering (ENG)
- School of Home Economics (HEC)
- School of Social Work (SWK)

The hand-coded information from the admissions records was then punched into the cards. These constituted the work deck which was taken to the Office of the Registrar to locate the record of first and third quarter achievement. The hours of coursework attempted, the points earned, and the cumulative OSU GPA for first and third quarters were then entered on each card. These additional items were then punched into the work deck.
The deck of Hollerith work cards was constituted according to
the following designation by column:

<table>
<thead>
<tr>
<th>Columns 1-6</th>
<th>Student number</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-30</td>
<td>Name</td>
</tr>
<tr>
<td>31-34</td>
<td>College of enrollment</td>
</tr>
<tr>
<td>35</td>
<td>Class rank</td>
</tr>
<tr>
<td>36</td>
<td>Sex</td>
</tr>
<tr>
<td>37-38</td>
<td>Month of birth</td>
</tr>
<tr>
<td>39-40</td>
<td>Year of birth</td>
</tr>
<tr>
<td>41-50</td>
<td>ACT Standard Scores</td>
</tr>
<tr>
<td>51</td>
<td>Quarter of admission</td>
</tr>
<tr>
<td>52</td>
<td>USOE classification</td>
</tr>
<tr>
<td>53</td>
<td>College identification</td>
</tr>
<tr>
<td>54</td>
<td>Number of colleges attended</td>
</tr>
<tr>
<td>55-57</td>
<td>Transfer hours attempted</td>
</tr>
<tr>
<td>58-60</td>
<td>Transfer points earned</td>
</tr>
<tr>
<td>61</td>
<td>High school rank decile</td>
</tr>
<tr>
<td>62-63</td>
<td>First quarter hours attempted</td>
</tr>
<tr>
<td>64-65</td>
<td>First quarter points earned</td>
</tr>
<tr>
<td>66-69</td>
<td>First quarter GPA</td>
</tr>
<tr>
<td>70-71</td>
<td>Third quarter hours attempted</td>
</tr>
<tr>
<td>72-74</td>
<td>Third quarter points earned</td>
</tr>
<tr>
<td>75-78</td>
<td>Third quarter GPA</td>
</tr>
</tbody>
</table>

After the three-space alphabetic designation for the OSU college or
school was changed into a single-space numeric code and the average of
coursework at former colleges was determined to three decimal places,
the data for the study group were then ready for initial analysis.

**Design and Methodology for the Study**

The work deck which had been prepared both mechanically and
manually was then incorporated into the design for the study. The appli-
cability of ACT results in the prediction of achievement for students
seeking to transfer to OSU was a major result obtained. As well, the
achievement records were related to the predictive qualities of the
former college record. The ultimate statistical treatment was the use
of the multiple regression analysis for identification of beta weights
of specific factors in the admissions information.
To apply the multiple regression program in the analysis by computer it was necessary first to transform the raw data into frequency distributions, including raw sums, raw sums of squares, and raw sums of cross products for correlation. Against these correlations, tests of statistical significance were applied at the .05 level of confidence; differences as great as these could not have happened by chance in 95 trials out of 100. OSU and college of enrollment norms were developed for each sex and GPA-level. These were further analyzed for both the regular and special admissions groups.

From the significant criteria, as these were analyzed by the investigator, the factors which suggested the greatest contributions were identified for implementation into the MR-90 program. Tests for analysis of variance were executed for all beta weights to determine statistically significant predictors.

The first and second purposes of the study were outlined from this multiple regression analysis. The relative effectiveness of previous academic performance and ACT results, respectively, in predicting academic success was analyzed. The third purpose concerning the differences in performance related to various other factors was reported from analysis of means. The fourth purpose concerning comparison of regular and special action admissions was supplied by reporting the similarities and differences of mean performance for the two subgroups. The test of regression equation was extended by treatment of the data for both the first and third quarter GPA's.
The statistical computations of the MR-90 program were processed by the Numerical Computation Laboratory of The Ohio State University Research Foundation. The IBM 7094 processed the regression analysis.

**Description of Statistical Terms**

The following material describes the statistical terms employed in the report of the findings in the next chapter. These are relevant to the statistical procedures developed in this study.

**Analysis of variance.** This is a method to determine the variance in the criterion attributable to the explained effects of the independent variable. The significance of the analysis of variance is tested by the "F" ratio, the significance between the multiple correlation coefficient and zero.

**Analysis of covariance.** This analysis is extended from the analysis of variance to derive the effect of the interaction of the independent variables and to provide an appropriate adjustment.

**Beta coefficient (B).** The Beta coefficient or beta weight is a standard score for each independent variable used in the description of the proportion that this variable contributes to the prediction of the criterion. The multiple correlations reflect the independent variables measured in different units; therefore, the regression weight (b) cannot be compared to determine the variable contributions. The beta weights can be compared because these are the sigma scores of the independent variables expressed in terms of standard score.
units. The weights have effect only in comparison with the other variables in that particular equation and cannot be substituted from one equation to another. The Beta coefficient does not present information similar to the correlation coefficient necessarily; two variables with the same correlation with the criterion may, when combined in a multiple regression analysis, have entirely different beta weights.

Multiple regression analysis. Garrett\(^4\) stated that the multiple regression coefficient (R) is the correlation between a set of obtained scores and the same scores predicted from the multiple regression equation. The multiple regression analysis is a linear equation which estimates the mean value of the criterion from the given values of the independent variables.

These statistical terms will be employed in the reporting of the findings in the next chapter.

CHAPTER IV

FINDINGS OF THE STUDY

The problem of this study emphasized the clarification of understandings through the development of predictive information about transfer students. This chapter presents the findings of the study through the reporting of the data and analysis of the statistics. The outline for the chapter proceeds from the general description of the data for the study group to the report of the effects of former achievement record, ACT, and other factors in the prediction of academic success in the first and through the third quarters at O.S.U. The final section reports the comparison of regular and special admissions.

Description of the Data

Frequency distributions of the study group were prepared to describe the 1,278 male and female transfer students. Means and standard deviations were also derived to expand the statistical analysis of the characteristics of this population.

The total group in the study numbered 1,278 students who had been admitted to O.S.U. in 1964 and who had registered and completed
one quarter of study. The following sections describe the data for these students:

1. College of enrollment
2. 1st quarter GPA
3. Former college GPA
4. ACT results
5. Other factors

**College of enrollment**

These data showed that the 1,273 students were divided among the five colleges and two schools at the undergraduate level of OSU in a way that appeared to be similar to the general enrollment of the university.\(^1\) In Table 1 the programs in agriculture, engineering, and business administration are predominantly offered to male students, whereas those in home economics and social work are primarily for women. Education appears to be mostly for women.

Table 2 reports the rank of these students at the freshman, sophomore, junior, or senior levels. More than one-half of the students were ranked at the freshman level with less than 50 quarter hours of credit completed. More than nine out of ten were ranked as freshmen and sophomores, lower division standing. No apparent differences in these ranks according to the colleges were indicated.

**First quarter GPA**

At OSU in their first quarter the 1,273 students showed achievement patterns relatively similar to that of the general student body.\(^2\)

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\(^1\) *Annual Report of the Registrar and Director of Admissions* (Columbus: The Ohio State University, 1965), p. 36.

### Table 1
**OSU College of Enrollment for Transfer Students**

<table>
<thead>
<tr>
<th>College</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR</td>
<td>49</td>
<td>1</td>
<td>50</td>
<td>3.9</td>
</tr>
<tr>
<td>ART</td>
<td>359</td>
<td>210</td>
<td>569</td>
<td>44.5</td>
</tr>
<tr>
<td>COM</td>
<td>162</td>
<td>9</td>
<td>171</td>
<td>13.4</td>
</tr>
<tr>
<td>EDU</td>
<td>35</td>
<td>267</td>
<td>352</td>
<td>27.6</td>
</tr>
<tr>
<td>ENG</td>
<td>71</td>
<td>1</td>
<td>72</td>
<td>5.6</td>
</tr>
<tr>
<td>HEC</td>
<td>0</td>
<td>37</td>
<td>37</td>
<td>2.9</td>
</tr>
<tr>
<td>SWK</td>
<td>6</td>
<td>21</td>
<td>27</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>732</strong></td>
<td><strong>546</strong></td>
<td><strong>1273</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

### Table 2
**OSU College Rank for Transfer Students**

<table>
<thead>
<tr>
<th>College</th>
<th>Freshmen</th>
<th>Sophomore</th>
<th>Junior</th>
<th>Senior</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR</td>
<td>28</td>
<td>20</td>
<td>2</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>ART</td>
<td>306</td>
<td>233</td>
<td>30</td>
<td>0</td>
<td>569</td>
</tr>
<tr>
<td>COM</td>
<td>97</td>
<td>67</td>
<td>5</td>
<td>1</td>
<td>171</td>
</tr>
<tr>
<td>EDU</td>
<td>213</td>
<td>122</td>
<td>9</td>
<td>3</td>
<td>352</td>
</tr>
<tr>
<td>ENG</td>
<td>50</td>
<td>20</td>
<td>2</td>
<td>0</td>
<td>72</td>
</tr>
<tr>
<td>HEC</td>
<td>17</td>
<td>15</td>
<td>5</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>SWK</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>731</strong></td>
<td><strong>488</strong></td>
<td><strong>55</strong></td>
<td><strong>4</strong></td>
<td><strong>1273</strong></td>
</tr>
</tbody>
</table>
Table 3 reports the findings for this study group on earned GPA. Mean GPA was 2.35 for the total group with high and low means for the colleges ranging from 2.43 for Education and 2.42 for Engineering down to 2.10 for Commerce and 2.13 for Social Work.

For the total group of students, fewer than three out of ten were doing less-than-satisfactory work in their studies; i.e., less than 2.0. It was probable that only two out of ten would be subject to dismissal consideration because the OSU requirement is 1.7 through six quarters of residency. Both Arts and Education, the largest colleges, had three-fourths of their students at "C" level or higher, whereas only three-fifths of the smaller groups in Agriculture and Commerce were holding their heads above "C" level. The students in Arts and Education appeared to be accumulating high standing with more success than students in other colleges, particularly Commerce and Home Economics; this is indicated by the frequency distributions. On the basis of mean performance students in Commerce and Social Work were at the lowest level.

**Former College GPA**

The transfer students in the records they had earned at their former colleges showed somewhat lower standing than that earned at OSU. The former standing as indicated in Table 4, showed a mean of 2.26 against the 2.35 earned at OSU. Home Economics with a mean of 2.36 and Education with 2.39 showed the highest means and Engineering with a mean of 2.02 and a median of 1.9 and Commerce with a mean of 2.07 and a median of 2.0 showed the lowest standing. More than one-fourth had less than 2.00 average in their former studies; the per
Table 3

OSU First Quarter GPA for Transfer Students
by College or School

<table>
<thead>
<tr>
<th>GPA Range</th>
<th>AGR</th>
<th>ART</th>
<th>CON</th>
<th>EDU</th>
<th>ENG</th>
<th>HEC</th>
<th>SWK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-0.4</td>
<td>0</td>
<td>14</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>0.5-0.9</td>
<td>4</td>
<td>16</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>1.0-1.4</td>
<td>1</td>
<td>48</td>
<td>16</td>
<td>28</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>106</td>
</tr>
<tr>
<td>1.5-1.9</td>
<td>15</td>
<td>64</td>
<td>33</td>
<td>51</td>
<td>16</td>
<td>11</td>
<td>4</td>
<td>194</td>
</tr>
<tr>
<td>2.0-2.4</td>
<td>9</td>
<td>163</td>
<td>52</td>
<td>96</td>
<td>15</td>
<td>8</td>
<td>9</td>
<td>357</td>
</tr>
<tr>
<td>2.5-2.9</td>
<td>13</td>
<td>110</td>
<td>24</td>
<td>85</td>
<td>7</td>
<td>9</td>
<td>2</td>
<td>250</td>
</tr>
<tr>
<td>3.0-3.4</td>
<td>5</td>
<td>96</td>
<td>22</td>
<td>57</td>
<td>20</td>
<td>8</td>
<td>4</td>
<td>212</td>
</tr>
<tr>
<td>3.5-4.0</td>
<td>3</td>
<td>53</td>
<td>7</td>
<td>27</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>93</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>AGR</th>
<th>ART</th>
<th>CON</th>
<th>EDU</th>
<th>ENG</th>
<th>HEC</th>
<th>SWK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>569</td>
<td>171</td>
<td>352</td>
<td>72</td>
<td>37</td>
<td>27</td>
<td>1278</td>
<td></td>
</tr>
</tbody>
</table>

Mean GPA: 2.22 2.33 2.10 2.43 2.42 2.38 2.13 2.35

S.D.: .73 .83 .81 .71 .77 .61 .87 .79

...
their OSU averages the middle half extended through a wider range from 1.8 to 2.8.

Table 4
Former College GPA of Transfer Students by College or School

<table>
<thead>
<tr>
<th>GPA</th>
<th>AGR</th>
<th>ART</th>
<th>COM</th>
<th>EDU</th>
<th>ENG</th>
<th>HEC</th>
<th>SWK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-0.4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>0.5-0.9</td>
<td>0</td>
<td>12</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>1.0-1.4</td>
<td>4</td>
<td>38</td>
<td>14</td>
<td>12</td>
<td>10</td>
<td>4</td>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>1.5-1.9</td>
<td>7</td>
<td>111</td>
<td>46</td>
<td>40</td>
<td>25</td>
<td>5</td>
<td>3</td>
<td>237</td>
</tr>
<tr>
<td>2.0-2.4</td>
<td>25</td>
<td>214</td>
<td>69</td>
<td>158</td>
<td>20</td>
<td>9</td>
<td>11</td>
<td>506</td>
</tr>
<tr>
<td>2.5-2.9</td>
<td>10</td>
<td>116</td>
<td>24</td>
<td>94</td>
<td>8</td>
<td>14</td>
<td>7</td>
<td>273</td>
</tr>
<tr>
<td>3.0-3.4</td>
<td>3</td>
<td>59</td>
<td>11</td>
<td>36</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>119</td>
</tr>
<tr>
<td>3.5-4.0</td>
<td>0</td>
<td>17</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>27</td>
</tr>
</tbody>
</table>

**N** 50 569 171 352 72 37 27 1278
**Mean** 2.19 2.27 2.07 2.39 2.02 2.36 2.26 2.26
**S.D.** .55 .62 .58 .53 .65 .68 .60 .60

**ACT results**

The results of testing with ACT are reported in Table 5; the means of performance and standard deviations on subtests by the population of 1,278 are reported. In overall effect the results indicated that mean performance for the Composite of 22.27 was approximately average, somewhat above the national norm for colleges. This figure
Table 5

Mean Performance on ACT for Transfer Students by College or School

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR</td>
<td>Mean</td>
<td>18.40</td>
<td>21.16</td>
<td>21.94</td>
<td>23.66</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>4.44</td>
<td>4.90</td>
<td>5.29</td>
<td>4.45</td>
</tr>
<tr>
<td>ART</td>
<td>Mean</td>
<td>21.47</td>
<td>21.89</td>
<td>24.51</td>
<td>23.98</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>4.06</td>
<td>5.61</td>
<td>5.02</td>
<td>4.97</td>
</tr>
<tr>
<td>COM</td>
<td>Mean</td>
<td>19.41</td>
<td>21.77</td>
<td>23.41</td>
<td>22.46</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>3.71</td>
<td>4.63</td>
<td>4.99</td>
<td>4.48</td>
</tr>
<tr>
<td>EDU</td>
<td>Mean</td>
<td>20.97</td>
<td>18.93</td>
<td>22.22</td>
<td>21.53</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>4.19</td>
<td>5.49</td>
<td>5.17</td>
<td>5.27</td>
</tr>
<tr>
<td>ENG</td>
<td>Mean</td>
<td>20.63</td>
<td>26.83</td>
<td>24.49</td>
<td>26.65</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>4.32</td>
<td>3.79</td>
<td>4.49</td>
<td>4.50</td>
</tr>
<tr>
<td>HEC</td>
<td>Mean</td>
<td>21.38</td>
<td>20.84</td>
<td>22.43</td>
<td>21.03</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>2.97</td>
<td>5.40</td>
<td>4.33</td>
<td>5.92</td>
</tr>
<tr>
<td>SWK</td>
<td>Mean</td>
<td>21.30</td>
<td>17.59</td>
<td>22.56</td>
<td>20.63</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>4.13</td>
<td>4.83</td>
<td>3.90</td>
<td>5.86</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td>20.88</td>
<td>21.19</td>
<td>23.53</td>
<td>23.09</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>4.13</td>
<td>5.65</td>
<td>5.10</td>
<td>5.19</td>
</tr>
</tbody>
</table>

was also comparable to the local figure of 23. Among the colleges the lowest composites were 20.59 for Social Work and 20.98 for Education and the highest were 24.76 in Engineering and 23.04 in Arts. The total results among the subtests indicated that the lowest result was in the

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English area and the highest in the reading subtests of Social Studies and Natural Sciences. The English subtest was not strikingly high for any college but seemed low especially for Agriculture. In the Mathematics subtest Social Work and Education showed lowest potentials and Engineering the highest average subtest score of all. The reading subtests were generally highest for Engineering and Arts and seemed lowest in Social Studies for Agriculture and Education and in Natural Science for Social Work and Home Economics.

Other factors

Other factors of description of the transfer students were tabulated. For detailed presentation of these data, Tables 42 through 46 record these distributional elements. These factors include the classification of the college from which the student transferred, the number of colleges attended, his high school decile, and his age.

The background of his former college studies was classified according to the four-level system employed by the U. S. Office of Education. Only 106, or 6.3 per cent, of the group transferred to OSU from junior or community colleges. This percentage is smaller than those discussed in the review of the literature. An additional 29.2 per cent were transfers from four-year baccalaureate degree colleges. Less than one-fourth came from institutions offering the master's degree as the highest degree conferred. The largest group, 38.8 per cent, were transfers from doctorate-degree granting institutions. Although the number of lower level colleges is greater, nearly
two-thirds of the students who transferred came from the master's and doctorate-level colleges and universities.

Information on the number of colleges attended by transfer students indicated that most attended only one college, although nearly one-fifth had attended two or more colleges.

Although the data concerning the high school decile ranking for the transfer students was not complete, it was established that students came from all levels of high school standing. The predominant group showed upper third standing with the decile standing indicating regressively smaller proportions at each level. Less than one-third came from the lower half of their high school classes.

The age of the transfer student population was available for nearly all the group. From a handful of eighteen-year-olds to one who was fifty-four years old, the group showed a diverse range. The median age-level was twenty. More than three-fourths of the group were twenty-one or younger when they transferred to OSU.

In summary, the composite transfer student would appear to be a twenty-year-old male who had attended a comprehensive university and earned a 2.26 GPA for three semesters of study. At OSU it appeared that he established his credentials for the program in Arts and Sciences with ACT standard scores of 21 in English and Mathematics and 23 in the reading tests of Social Studies and Natural Sciences; this information tends to substantiate his upper-third high school standing. Ranked as a freshman with his advanced hours of credit, he earned a GPA in his first quarter of 2.34, somewhat higher than in his previous studies.
The next section describes the findings of the multiple regression analysis in the prediction of first quarter GPA at OSU.

**Prediction for Total Group of Transfer Students**

For the 1,276 students included in the study group, twenty-four multiple regression analyses were calculated in the MR-90 program conducted through the IBM 7094 computer. This section reports the statistics which were prepared through these analyses for the total group with the independent variables of the former college GPA and ACT. Mentioned first is the analysis employing the four subtests of ACT and second is the one using the Composite standard score; the subtest standard scores had to be considered in one grouping and the Composite in another because the latter is comprised of the former. These results are also shown for individual colleges and schools in this five-variable and two-variable manner.

**Total group of transfer students**

In Table 6 the compiled data for the study group were analyzed statistically to present the relationships and relative weights of the variables. These report the prediction of first quarter GPA at OSU utilizing the ACT subtests. The multiple correlation coefficient ($R$) for the group was .483. The amount of variance of the criterion measure attributable to the joint action of the independent variables is reported by $R^2$. The significance between the multiple correlation coefficient and zero is indicated in the tables as "F"; these scores were tested for significance at the .05 level of confidence. Other
Table 6

Prediction of First Quarter GPA for Total Group of Transfer Students from ACT Subtests and Former College GPA

\[ R = .488 \quad \quad R^2 = .238 \]
\[ N = 1278 \quad \quad F = 79.55 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>.37</td>
<td>.2080</td>
<td>.039864</td>
<td>7.04</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>.23</td>
<td>.0695</td>
<td>.009751</td>
<td>2.32</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>.32</td>
<td>.1088</td>
<td>.016896</td>
<td>3.36</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>.29</td>
<td>.0892</td>
<td>.013610</td>
<td>2.66</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.31</td>
<td>.2637</td>
<td>.346821</td>
<td>10.51</td>
</tr>
</tbody>
</table>

\( t^* (05) = 1.96 \)
\( df = 1272 \)
\( a = .18850 \)

The statistics of the table include the degrees of freedom (df) used to determine the identified probability identification (t). Where (a) is indicated, the constant derived from the effect of the interaction of the independent variables reports the variance to be added to any prediction table from these statistics. The regression weights (b) are provided from the multiple regression equations for each of the independent variables when the criterion (Y) is predicted from the regression weights in combination. The beta coefficient (\( \beta \)) or beta weight is
derived from standard scores of the independent variables and may thus be expressed in terms of weights within the particular equation.

Data from Table 6 showed that the correlation coefficients were highest for ACT English, ACT Social Studies, and Former College GPA, but the beta weight of most effect was Former College GPA with one-fourth more effect than the English score and two-and-one-half times more than Social Studies score. The regression weights were each significant at the .05 level of confidence. The variables of ACT English and Former College GPA were twice as effective in predicting the first quarter GPA than the other three variables.

Table 7 reports the statistics for the prediction of first quarter GPA for the total group by utilizing the ACT Composite and Former College GPA as the variables to establish the criterion. The multiple R for this analysis is .474, slightly below that of the previous table. The variance ($R^2$) is also somewhat less. The F was significant at the .05 level of confidence. The coefficient of relationship of Former College GPA was .31, the same figure as in the previous table. However, ACT Composite showed an r of .38, higher than any of the subtests. In the regression analysis the testing information showed a relationship of five parts to four for the former achievement record. It appeared that generally a combination of the two factors was helpful in predicting first quarter achievement at OSU.

The following subsections report the statistics and data for the individual colleges and schools in the study. Several of the groups were smaller and consequently the results were more difficult to describe in statistical qualifications. But in addition these
Table 7

Prediction of First Quarter GPA for Total Group of Transfer Students from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>$\beta$</th>
<th>b</th>
<th>$t_b^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.38</td>
<td>.3550</td>
<td>.071024</td>
<td>14.34</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.31</td>
<td>.2844</td>
<td>.374056</td>
<td>11.49</td>
</tr>
</tbody>
</table>

$R = .474$  \hspace{1cm} $R^2 = .224$

$N = 1278$  \hspace{1cm} $F = 184.26$

Subsections depicted differences among the colleges in admissions interest and performance expectancies.

Agriculture. The multiple regression analyses for the prediction of first quarter GPA in the College of Agriculture were reported for 50 students who transferred to OSU. As indicated in Table 8, the multiple $R$ was .383 for the use of ACT subtests; however, none of the regression weights was significant as contributors to the prediction, due to the small number in the study group. The highest single $r$'s were Former College GPA, .30, and ACT Mathematics, .28; these variables also showed the greatest contribution to the prediction of nearly five to one against the other variables. The small number of the group in
Table 8

Prediction of First Quarter GPA for Transfer Students to Agriculture from ACT Subtests and Former College GPA

\[
\begin{align*}
R &= 0.383 \\
R^2 &= 0.146 \\
N &= 50 \\
F &= 1.51
\end{align*}
\]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>.11</td>
<td>-.1077</td>
<td>-.017695</td>
<td>-0.60</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>.28</td>
<td>.2589</td>
<td>.038527</td>
<td>1.45</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>.15</td>
<td>.0645</td>
<td>.008886</td>
<td>0.37</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>.12</td>
<td>-.0299</td>
<td>-.004885</td>
<td>-0.18</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.30</td>
<td>.2615</td>
<td>.345847</td>
<td>1.79</td>
</tr>
</tbody>
</table>

\( t^* \) (.05) = 2.02

\[ df = 44 \]

\[ a = -0.89535 \]

With the two-variable multiple regression analysis reported in Table 9, the multiple R is somewhat reduced to .338, but the F test is raised to the .05 level of confidence. Neither of the regression weights was found to be significant, but in this relationship the former college GPA was found to show greater contribution than the testing information.
Table 9
Prediction of First Quarter GPA for Transfer Students to Agriculture from ACT Composite and Former College GPA

\[ R = 0.338 \quad R^2 = 0.114 \]
\[ N = 50 \quad F = 3.04 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>( 0.23 )</td>
<td>( 0.1574 )</td>
<td>( 0.030287 )</td>
<td>( 1.11 )</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>( 0.30 )</td>
<td>( 0.2612 )</td>
<td>( 0.345345 )</td>
<td>( 1.84 )</td>
</tr>
</tbody>
</table>

\( t^* (05) = 2.01 \)
\( df = 47 \) \( a = -0.81552 \)

**Arts and Sciences.** The 569 transfer students admitted to Arts and Sciences showed a multiple R of 0.501, as reported in Table 10. Utilizing the ACT subtests the multiple regression analysis established that the verbal tests were significant and Mathematics and Natural Science were not. Former College GPA was nearly as important in predicting OSU marks as was the combination of ACT English and ACT Social Studies. The weights of these three variables were proportionately sixty-to-one against the math and science indicators.
Table 10
Prediction of First Quarter GPA for Transfer Students to Arts and Sciences from ACT Subtests and Former College GPA

\[ R = 0.501 \]
\[ R^2 = 0.251 \]
\[ N = 569 \]
\[ F = 37.66 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>t( \beta )*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>0.36</td>
<td>0.1909</td>
<td>0.039196</td>
<td>4.31</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>0.20</td>
<td>0.0510</td>
<td>0.007580</td>
<td>1.15</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>0.35</td>
<td>0.1568</td>
<td>0.026042</td>
<td>3.26</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>0.29</td>
<td>0.0670</td>
<td>0.011227</td>
<td>1.35</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.34</td>
<td>0.2893</td>
<td>0.388075</td>
<td>7.74</td>
</tr>
</tbody>
</table>

\( t* (05) = 1.96 \)
\( \text{df} = 563 \)
\( a = .41582 \)

For the two-variable approach in the multiple regression analysis the multiple R was somewhat lower at 0.487. Table 11 reports that the F test, also significant at the .05 level, was raised considerably. The regression weights were each significant and the beta weights were nearly equal in the effect of their relative contribution to the prediction of first quarter performance at OSU.
Table 11

Prediction of First Quarter GPA for Transfer Students to Arts and Sciences from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>$\beta$</th>
<th>b</th>
<th>$t_{b^*}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.38</td>
<td>.3531</td>
<td>.076069</td>
<td>9.59</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.34</td>
<td>.3084</td>
<td>.413646</td>
<td>8.38</td>
</tr>
</tbody>
</table>

$t^{*} (0.05) = 1.96$

df 566

$a = .31173$

**Commerce.** The five-variable approach to multiple regression analysis was studied for the 171 students admitted to the College of Commerce and Administration. This information is reported in Table 12. A multiple $R$ of .467 indicated nearly average standing among the colleges and schools within the whole group. Two variables with $r$'s of .25 and .23 did not show significant regression weights; these were ACT Social Studies and ACT Natural Sciences, respectively, the reading materials of ACT. ACT Mathematics with an $r$ of .37 showed the greatest contribution of weight to the prediction of achievement, although ACT English was nearly equal in effect. These two variables
Table 12

Prediction of First Quarter GPA for Transfer Students to Commerce from ACT Subtests and Former College GPA

\[ R = .467 \]
\[ R^2 = .218 \]
\[ N = 171 \]
\[ F = 9.21 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_{b}^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>.34</td>
<td>.2342</td>
<td>.050835</td>
<td>3.09</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>.37</td>
<td>.2747</td>
<td>.047830</td>
<td>3.39</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>.25</td>
<td>.0481</td>
<td>.007758</td>
<td>0.55</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>.23</td>
<td>-.0315</td>
<td>-.005674</td>
<td>-0.03</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.17</td>
<td>.1472</td>
<td>.205631</td>
<td>2.12</td>
</tr>
</tbody>
</table>

\[ t^* (05) = 1.96 \]
\[ df = 165 \]
\[ a = .52194 \]

showed four times greater weight than Former College GPA, also a significant regression weight.

In the regression analysis of ACT Composite and Former College GPA reported in Table 13, the multiple \( R \) was reduced somewhat to .410, with consequent reduction in variance control. Both variables showed significant regression weights; however, the beta weights showed that ACT Composite was twice as effective in the contribution made than Former College GPA.
Table 13

Prediction of First Quarter GPA for Transfer Students to Commerce from ACT Composite and Former College GPA

\[
R = .410 \\
N = 171
\]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>β</th>
<th>b</th>
<th>t_b*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.38</td>
<td>.3751</td>
<td>.088738</td>
<td>5.33</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.17</td>
<td>.1548</td>
<td>.216162</td>
<td>2.20</td>
</tr>
</tbody>
</table>

\[ t* (05) = 1.96 \]
\[ df = 168 \]
\[ a = .29320 \]

**Education.** Information concerning the 352 students admitted to the College of Education is reported in Tables 14 and 15. The highest multiple R of .541 was established for this group in the five-variable analysis. The single r's ranged from .30 for ACT Mathematics up to .41 for ACT English, although the significance factor of the regression weights showed highest for Former College GPA and ACT Natural Science. Both ACT Mathematics and ACT Social Studies were not found to be significant. Former College GPA was found to contribute approximately forty per cent of the prediction analysis.
Table 14

Prediction of First Quarter GPA for Transfer Students to Education from ACT Subtests and Former College GPA

\[ R = 0.541 \quad R^2 = 0.293 \]
\[ N = 352 \quad F = 28.64 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>0.41</td>
<td>0.1805</td>
<td>0.030779</td>
<td>2.98</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>0.30</td>
<td>0.0393</td>
<td>0.005116</td>
<td>0.70</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>0.37</td>
<td>0.0827</td>
<td>0.011441</td>
<td>1.35</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>0.40</td>
<td>0.1962</td>
<td>0.026609</td>
<td>3.26</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.37</td>
<td>0.2628</td>
<td>0.352285</td>
<td>5.56</td>
</tr>
</tbody>
</table>

\[ t^* (05) = 1.96 \]
\[ df = 346 \quad a = -0.01707 \]

In utilizing the ACT Composite with Former College GPA the relationship indicated by the multiple \( R \) was lowered slightly to 0.525. Both regression weights were significant at the .05 level of confidence. The greater contribution was established with ACT Composite, but the Former College GPA still provided approximately forty per cent of the prediction. The single \( r \)'s were 0.45 for ACT Composite and 0.37 for the former record of college study.
Table 15

Prediction of First Quarter GPA for Transfer Students to Education from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.45</td>
<td>.3811</td>
<td>.067530</td>
<td>8.13</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.37</td>
<td>.2828</td>
<td>.378988</td>
<td>6.03</td>
</tr>
</tbody>
</table>

\( t^* (05) = 1.96 \)

\( df = 349 \)

The regression weights were significant according to the established standard. The beta weights showed that ACT Natural Science score was most predictive, but with ACT English and Social Studies these seemed to be lightweight contributors. The single r's showed this same relationship.
Table 16

Prediction of First Quarter GPA for Transfer Students To Engineering from ACT Subtests and Former College GPA

R = .407
N = 72
R² = .165
F = 2.62

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>β</th>
<th>b</th>
<th>t_b*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>.30</td>
<td>.1126</td>
<td>.020178</td>
<td>0.80</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>.24</td>
<td>.0843</td>
<td>.017177</td>
<td>0.64</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>.33</td>
<td>.1411</td>
<td>.024291</td>
<td>0.91</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>.36</td>
<td>.1803</td>
<td>.030996</td>
<td>1.13</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>-.01</td>
<td>-.0138</td>
<td>-.016404</td>
<td>-.12</td>
</tr>
</tbody>
</table>

For the two-variable regression analysis in Table 17 the multiple R was raised somewhat to .414 and the F test was significant to a surer level of confidence. That ACT Composite showed a single r of .41, higher than each individual r of the subtest approach, with a significant regression weight. Former College GPA showed a correlation of no relationship and slightly negative regression weight. ACT Composite presented evidence of being four times more important in the prediction of OSU achievement in Engineering.
Table 17

Prediction of First Quarter GPA for Transfer Students to Engineering from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>$\beta$</th>
<th>b</th>
<th>$t_b^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.41</td>
<td>.4139</td>
<td>.095784</td>
<td>3.78</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>-.01</td>
<td>-.0070</td>
<td>-.008297</td>
<td>-.06</td>
</tr>
</tbody>
</table>

$t^* (05) = 2.00$

df 69  \quad a = -.06456

**Home Economics.** For the small $N$ of 37 in Home Economics, Table 18 shows a multiple $R$ of .867 for which three-fourths of the criterion was accounted for in the five variables ($R^2$). The single $r$'s ranged from .34 for ACT Natural Science up to .69 for ACT English with ACT Social Studies and Former College GPA at .60 and .56, respectively. The regression weights were significant for the high pair also and their Beta coefficients contributed the most weight to the prediction of OSU standing.
Table 18

Prediction of First Quarter GPA for Transfer Students
to Home Economics from ACT Subtests and Former
College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>$\beta$</th>
<th>b</th>
<th>$t_b^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>.69</td>
<td>.5269</td>
<td>.107736</td>
<td>4.31</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>.46</td>
<td>.1879</td>
<td>.021095</td>
<td>1.50</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>.60</td>
<td>.4696</td>
<td>.065777</td>
<td>3.79</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>.34</td>
<td>-.3612</td>
<td>-.036985</td>
<td>-2.47</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.56</td>
<td>.2516</td>
<td>.224094</td>
<td>2.42</td>
</tr>
</tbody>
</table>

$t^* (05) = 2.04$

df 31

The multiple $R$ was reduced somewhat to .761 when the two-variable regression analysis was established as reported in Table 19. Again the small size of the group suggested the reason for the high degree of this relationship. Single r's of .59 for ACT Composite and .56 for Former College GPA were established from the data. The Beta coefficients were approximately equal in weight for the prediction of OSU achievements.
Table 19

Prediction of First Quarter GPA for Transfer Students to Home Economics from ACT Composite and Former College GPA

\[ R = 0.761 \]
\[ R^2 = 0.580 \]
\[ N = 37 \]
\[ F = 23.46 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion ( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.59</td>
<td>0.5190</td>
<td>0.084735</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.56</td>
<td>0.4815</td>
<td>0.428876</td>
</tr>
</tbody>
</table>

\[ t^* (05) = 2.04 \]
\[ df = 34 \]
\[ a = 0.46074 \]

**Social Work.** Table 20 reports the information concerning the 27 students admitted to Social Work utilizing the ACT subtests with Former College GPA. The multiple correlation coefficient was 0.527 although the F test was not significant for this group. ACT English with an \( r \) of 0.39 and Former College GPA with an \( r \) of 0.36 showed the highest relationships at this level, but none of the regressions weights was significant. ACT English and Former College GPA showed the most contributing weights for the prediction.
Table 20
Prediction of First Quarter GPA for Transfer Students
 to Social Work from ACT Subtests and Former
College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>$\beta$</th>
<th>b</th>
<th>$t_b^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT English</td>
<td>.39</td>
<td>.4141</td>
<td>.086776</td>
<td>1.73</td>
</tr>
<tr>
<td>ACT Mathematics</td>
<td>.19</td>
<td>.0925</td>
<td>.016579</td>
<td>0.46</td>
</tr>
<tr>
<td>ACT Social Studies</td>
<td>.21</td>
<td>.0248</td>
<td>.005508</td>
<td>0.11</td>
</tr>
<tr>
<td>ACT Natural Science</td>
<td>.19</td>
<td>-.1843</td>
<td>-.027199</td>
<td>-0.76</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.36</td>
<td>.3535</td>
<td>.508980</td>
<td>1.82</td>
</tr>
</tbody>
</table>

$t^* (05) = 2.08$

df 21  
$a = .72384$

On the two-variable analysis reported in Table 21, the multiple
$R$ was lowered to .426, again without a significant $F$ test. Neither
ACT Composite nor Former College GPA were significant in their re-
gression weights. Former College GPA suggested a somewhat greater
contribution to the prediction than did the testing information. The
small size of the group is responsible for reducing the significance
of the statistics.
Table 21
Prediction of First Quarter GPA for Transfer Students to Social Work from ACT Composite and Former College GPA

\[ R = 0.426 \quad R^2 = 0.181 \]
\[ N = 27 \quad F = 2.66 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.30</td>
<td>0.2392</td>
<td>0.058765</td>
<td>1.27</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.36</td>
<td>0.3104</td>
<td>0.446969</td>
<td>1.65</td>
</tr>
</tbody>
</table>

\[ t^* (05) = 2.06 \]
\[ df = 24 \]
\[ a = 0.09125 \]

**Summary findings for the total group**

The tables included in this section of the findings established the relationship of testing information and former college achievement in the prediction of first quarter marks for the entire group of transfer students. In general effect, the five-variable approach utilizing the ACT subtests and Former College GPA was slightly more effective in the prediction. However, the ACT Composite as a single factor with Former College GPA did not significantly lower the effectiveness of the prediction with simpler statistics. The information of Table 22 reports these statistics utilizing the multiple
**Table 22**

Differences of Multiple Correlation Coefficients for Five-Variable and Two-Variable Predictive Criteria of First Quarter GPA for Total Group of Transfer Students

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>5-Variable</th>
<th>Z</th>
<th>2-Variable</th>
<th>Z</th>
<th>Dz</th>
<th>W-Dz</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR</td>
<td>50</td>
<td>.383</td>
<td>.404</td>
<td>.338</td>
<td>.352</td>
<td>.252</td>
<td></td>
</tr>
<tr>
<td>ART</td>
<td>569</td>
<td>.501&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.551</td>
<td>.487&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.532</td>
<td>.320</td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>171</td>
<td>.467&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.506</td>
<td>.410&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.436</td>
<td>.642</td>
<td></td>
</tr>
<tr>
<td>EDU</td>
<td>352</td>
<td>.541&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.606</td>
<td>.525&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.583</td>
<td>.304</td>
<td></td>
</tr>
<tr>
<td>ENG</td>
<td>72</td>
<td>.407&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.432</td>
<td>.414&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.440</td>
<td>-.047</td>
<td></td>
</tr>
<tr>
<td>HEC</td>
<td>37</td>
<td>.867&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.363</td>
<td>.761&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.999</td>
<td>1.501</td>
<td></td>
</tr>
<tr>
<td>SWK</td>
<td>27</td>
<td>.527</td>
<td>.586</td>
<td>.426</td>
<td>.455</td>
<td>.454</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>.488&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.533</td>
<td>.474&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.515</td>
<td>.455</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Significant at .05 level of confidence

<sup>b</sup>Differences not significant at .05 level of confidence

correlation coefficients for the five-variable and two-variable approaches to predict first quarter GPA. As indicated therein, the R's were significant for the total group and each individual college or school except Agriculture and Social Work. Because the multiple correlation coefficient (R) is the correlation between a set of obtained scores and the same scores predicted from the multiple regression equation<sup>4</sup> it is the equivalent of a simple r between the obtained GPA

and the predicted GPA. To determine the significance of the difference between R's for these two approaches, the R's were converted to Fisher's $z$ function. Then the ratio was computed between the difference of the $z$'s and the standard error of the difference between the $z$'s. None of the computed ratios was significant at the .05 level of confidence. It can thus be concluded that the multiple R's for the larger five-variable regression analysis and the two-variable did not differ significantly; either approach performs the prediction adequately with these transfer students.

Among the subtests ACT English was the most significant contributor to the prediction of academic average at OSU. In the regression analyses for the individual colleges and schools, however, exceptions to general finding were established for Agriculture, Commerce, and Engineering students. The larger size of the groups in Arts and Education supported this emphasis upon ACT English.

ACT Social Studies was the other subtest contributing greater weight to the prediction because of the support of the larger samples in Arts and Education. ACT Mathematics was the heaviest contributor to the prediction of OSU marks in the programs of Agriculture and Commerce, although the former was not judged to be significant. ACT Natural Science was prominent in the prediction formula established for Education and Engineering.

---

In relationship with the ACT subtest, Former College GPA was the most important factor in the regression analysis for total group and for Agriculture, Arts and Sciences, and Education. It was not considered to be a predictor of weight for marks earned in Engineering.

When the ACT Composite, the product of the subtests, was considered, its effect was the heavier predictor for the total group and also for the groups in the specialized programs of the university. For all programs except Agriculture and Social Work, ACT Composite was equivalent to or greater than the weight of the former college record in determining the expected achievement at OSU; the results for the two exceptions were not found to be significant and were of effect to only five per cent of the total group. ACT Composite appeared to be an effective contributor to the prediction of achievement at OSU.

Former College GPA in relationship with ACT subtests was typically the heaviest contributor to the regression analysis. Exceptions to this were found in Commerce, Engineering, Home Economics, and Social Work. The latter two were small in size and not necessarily significant in effect. For Commerce and Engineering, the findings indicate that the record of former studies is not the significant factor in the prediction of performance at OSU that it is for other colleges. These are specialized programs depending upon defined interests.

In the relationship with ACT Composite, the former college record tended not to be so important as testing information. But it was typically near or equivalent to the ACT Composite. Only for
Agriculture and Social Work was the Former College GPA the more important weight in the prediction formula. It was the much lower weight in the prediction for both Commerce and Engineering, as indicated above.

In overall relationship the testing information and record of former studies showed relatively equivalent standing accounting for approximately one-fourth of the variables operant in the achievement patterns of this study group of transfer students at OSU. These results, when compared to other data and statistics compiled by the university, were relatively similar in pattern of relationships. However, the transfer students were somewhat more diverse in their prediction patterns; not so much consistency for the group was realized and more variation for the individual members of the group was apparent.

The next section analyzes the subgroup of transfer students who were found to have continued into their third quarter.

Prediction for Subgroup of Transfer Students

From the total of 1,278 students who were initially admitted to OSU and did complete a first quarter of study came the subgroup reviewed in this section of the study. Practically two-thirds of the entire group continued into their third quarter of study at OSU; the number was 856.

Multiple regression analyses had been performed for this subgroup from their first quarter achievement and also their third to study a longitudinal effect. Analysis of the findings was undertaken
to determine the significance of the findings for the purposes of the study. The R's reported in Table 23 showed that the narrowing of the range of the distribution for the subgroup in its first quarter depressed the significance of the relationships. But the effect of a longitudinal period through a year of academic performance reestablished the higher relationships which had been found for the total group.

In Table 24 the R's were compiled for the subgroup in its third quarter prediction equations to determine the significance of the differences between the five-variable and two-variable multiple regression analyses. Again, as with the total group, it was found that the differences of the R's for each college or school and the total subgroup were not significant. It was concluded that the two-variable approach was as significant in prediction as the more complex five-variable approach. Therefore, the material for this section included only the analysis of the relationship of ACT Composite and Former College GPA and does not dwell upon the effects of the four subtests. The table concluded that the multiple regression analysis with these variables showed a multiple R of .500 for this subgroup; this statistic compares to a .474 found for the entire group of 1,278.

The next sections cover the two-variable regression analyses for each college and school for first and third quarter GPA's earned by this subgroup of 856.
Table 23
Multiple Correlation Coefficients for First Quarter GPA and Third Quarter GPA for Subgroup of Transfer Students

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>First Quarter</th>
<th></th>
<th>Third Quarter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5-Var.</td>
<td>2-Var.</td>
<td>5-Var.</td>
<td>2-Var.</td>
<td>5-Var.</td>
</tr>
<tr>
<td>AGR</td>
<td>38</td>
<td>.228</td>
<td>.184</td>
<td>.365</td>
<td>.283</td>
</tr>
<tr>
<td>ART</td>
<td>380</td>
<td>.440*</td>
<td>.419*</td>
<td>.547*</td>
<td>.531*</td>
</tr>
<tr>
<td>COM</td>
<td>99</td>
<td>.480*</td>
<td>.441*</td>
<td>.523*</td>
<td>.502*</td>
</tr>
<tr>
<td>EDU</td>
<td>247</td>
<td>.408*</td>
<td>.381*</td>
<td>.535*</td>
<td>.517*</td>
</tr>
<tr>
<td>ENG</td>
<td>45</td>
<td>.497*</td>
<td>.470*</td>
<td>.541*</td>
<td>.512*</td>
</tr>
<tr>
<td>HEC</td>
<td>29</td>
<td>.810*</td>
<td>.724*</td>
<td>.708*</td>
<td>.700*</td>
</tr>
<tr>
<td>SWK</td>
<td>18</td>
<td>.742</td>
<td>.535</td>
<td>.675</td>
<td>.383</td>
</tr>
<tr>
<td>Total</td>
<td>856</td>
<td>.540*</td>
<td>.398*</td>
<td>.517*</td>
<td>.500*</td>
</tr>
</tbody>
</table>

*Significant at .05 level of confidence
Table 24

Multiple Correlation Coefficients for Five-Variable and Two-Variable Predictive Criteria of Third Quarter GPA for Subgroup of Transfer Students

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>5-Variable</th>
<th>2-Variable</th>
<th>( D_{z}/\alpha D_{Z} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>z</td>
<td>R</td>
</tr>
<tr>
<td>AGR</td>
<td>38</td>
<td>.365</td>
<td>.383</td>
<td>.283</td>
</tr>
<tr>
<td>ART</td>
<td>380</td>
<td>.547(^{a})</td>
<td>.614</td>
<td>.531(^{a})</td>
</tr>
<tr>
<td>COM</td>
<td>99</td>
<td>.523(^{a})</td>
<td>.581</td>
<td>.502(^{a})</td>
</tr>
<tr>
<td>EDU</td>
<td>247</td>
<td>.535(^{a})</td>
<td>.597</td>
<td>.517(^{a})</td>
</tr>
<tr>
<td>ENG</td>
<td>45</td>
<td>.541(^{a})</td>
<td>.606</td>
<td>.512(^{a})</td>
</tr>
<tr>
<td>HEC</td>
<td>29</td>
<td>.708(^{a})</td>
<td>.883</td>
<td>.700(^{a})</td>
</tr>
<tr>
<td>SWK</td>
<td>18</td>
<td>.675</td>
<td>.820</td>
<td>.383</td>
</tr>
<tr>
<td>Total</td>
<td>856</td>
<td>.517(^{a})</td>
<td>.572</td>
<td>.500(^{a})</td>
</tr>
</tbody>
</table>

\(^{a}\)Significant at .05 level of confidence

\(^{b}\)Differences not significant at .05 level of confidence
Total subgroup

According to Table 25 the prediction equation for first quarter GPA for 856 students who demonstrated longer-term standing at OSU, the ACT Composite was somewhat more important as a contributor to the equation at a five-to-four ratio. But the multiple R was lowered to .398 and only sixteen per cent of the variance was covered by these variables.

In the information of Table 26 the statistics for the third quarter GPA are reported. The multiple R raised to .500 and the two variables reversed positions of relative contribution to the equation. Both regression weights were significant at the .05 level of confidence. The data for the subgroup appeared to indicate that immediately in the first quarter testing information provides greater weight in the prediction, a feature true for the entire group in this study. But as the study period is extended to one academic year, then the former record of studies increases in importance. The next sections review these statistics for each college and school.

Agriculture. According to Tables 27 and 28 the information students in the College of Agriculture were not judged to be significant, probably due to the small number in the group. Thirty-eight of the original fifty continued through their third quarter; this is more than three-fourths of the original group, a proportion higher than the entire subgroup. Neither the multiple R's nor the regression weights were significant. The beta weights did not demonstrate clear-cut differences.
Table 25

Prediction of First Quarter GPA for Subgroup of Transfer Students from ACT Composite and Former College GPA

\[
R = .398 \\
N = 856 \\
R^2 = .158 \\
F = 80.28
\]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>t_\beta^*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.32</td>
<td>.2922</td>
<td>.045461</td>
<td>9.26</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.27</td>
<td>.2443</td>
<td>.240602</td>
<td>7.74</td>
</tr>
</tbody>
</table>

\[
t^* (05) = 1.96 \\
df = 853 \\
a = -1.05414
\]

In the College of Arts and Sciences, 380 of the original group of 569 were tallied for prediction based upon third quarter performance. This proportion was somewhat less than the three-fourths showed by the previous college. As reported in Table 29, the multiple R was significant but lowered from the larger group of the total sample. The beta weights do not establish a definite difference between the two variables.
Table 26
Prediction of Third Quarter GPA for Subgroup of Transfer Students from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.34</td>
<td>0.3065</td>
<td>0.043354</td>
<td>10.29</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.40</td>
<td>0.3673</td>
<td>0.328778</td>
<td>12.33</td>
</tr>
</tbody>
</table>

\[ t^* (05) = 1.96 \]
\[ df = 853 \]
\[ a = -.80547 \]

However, in Table 30 which shows the third quarter GPA prediction for Arts students the multiple correlation coefficient was enhanced to 0.531, an \( R \) significant at the 0.05 level of confidence. The beta weights indicated a shift in emphasis with Former College GPA taking a four-to-three lead over the testing information. This is a contrast to the first-quarter prediction for the entire beginning group.
Table 27

Prediction of First Quarter GPA for Subgroup of Transfer Students to Agriculture from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>β</th>
<th>b</th>
<th>t_b*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.15</td>
<td>.1214</td>
<td>.017664</td>
<td>0.71</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.14</td>
<td>.1112</td>
<td>.125863</td>
<td>0.65</td>
</tr>
</tbody>
</table>

R = .184  
R² = .034  
N = 38  
F = 0.61

t* (05) = 2.03  
df = 35  
a = -1.74170

Commerce. Tables 31 and 32 report the statistics for students admitted to the College of Commerce and Administration who were successful in completing their third quarters. It continued to support that the more important information in the prediction came from the ACT Composite. The subgroup showed single r's of .42 and .31 for ACT Composite and Former College GPA, respectively. These were the highest for the third quarter group than the other samples for Commerce. With the multiple R of .502, the regression equation for third-quarter students appeared to have most important effect. Only
Table 28
Prediction of Third Quarter GPA for Subgroup of Transfer Students to Agriculture from ACT Composite and Former College GPA

\[ R = 0.283 \]
\[ R^2 = 0.080 \]
\[ N = 38 \]
\[ F = 1.53 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.23</td>
<td>0.1906</td>
<td>0.020743</td>
<td>1.14</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.22</td>
<td>0.1675</td>
<td>0.141769</td>
<td>1.00</td>
</tr>
</tbody>
</table>

\( t^* (05) = 2.03 \)
\( df = 35 \)
\( a = -1.50128 \)

three-fifths of this group completed the third quarter of study at OSU, less than the average for the entire subgroup in this study.

**Education.** Students admitted to the College of Education completed the third quarter of their OSU studies about on a par with the entire group. The multiple \( R \) for the third quarter achievement prediction was 0.517, nearly as high as that for the total group reported in the previous material. For the entire group the ACT Composite had been a greater weight in the prediction; in the evidence of the first
Table 29

Prediction of First Quarter GPA for Subgroup of Transfer Students to Arts and Sciences from ACT Composite and Former College GPA

\[ R = 0.419 \quad R^2 = 0.176 \]
\[ N = 380 \quad F = 40.14 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion ( \beta )</th>
<th>( b )</th>
<th>( t_{b*} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.32</td>
<td>0.2953</td>
<td>0.048502</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.30</td>
<td>0.2693</td>
<td>0.269414</td>
</tr>
</tbody>
</table>

\[ t* (05) = 1.96 \]
\[ df = 377 \quad a = -0.92009 \]

Quarter achievement reported in Table 33 for the subgroup Former College GPA has almost twice as much effect in the prediction equation. Then adding the statistics from Table 34 for third quarter prediction the effects are practically equalized for the two independent variables. In this latter table the single \( r \)'s were 0.39 and 0.40 for ACT Composite and Former College GPA, respectively. The students in Education appeared to show more variation with significance levels determined than other colleges and schools.
Table 30

Prediction of Third Quarter GPA for Subgroup of Transfer Students to Arts and Sciences from ACT Composite and Former College GPA

\[ R = 0.531 \quad R^2 = 0.282 \]
\[ N = 380 \quad F = 74.18 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.35</td>
<td>0.3094</td>
<td>0.046214</td>
<td>7.06</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.43</td>
<td>0.4023</td>
<td>0.366018</td>
<td>9.18</td>
</tr>
</tbody>
</table>

\( t^* (05) = 1.96 \)
\( df = 377 \)
\( a = -0.63190 \)

Engineering. The multiple regression analyses for students admitted to Engineering showed increasing relationship to more effective prediction of achievement when related to those who maintained a longer term of study in the university. From a multiple \( R \) of 0.414 for the entire group of 72 in their first quarter to the 45 who completed three quarters with \( R \)'s of 0.470 for first quarter and 0.512 for third, the trend was to an increasing relationship in the prediction of achievement. Tables 35 and 36 report the statistics for this group of 45 engineering students, less than two-thirds of those who started initially. The single \( r \) was 0.51 for ACT Composite and only 0.08 for
Table 31

Prediction of First Quarter GPA for Subgroup of Transfer Students to Commerce from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>$\beta$</th>
<th>b</th>
<th>$t_{b*}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.40</td>
<td>.3847</td>
<td>.066302</td>
<td>4.19</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.22</td>
<td>.1854</td>
<td>.169444</td>
<td>2.02</td>
</tr>
</tbody>
</table>

$t^* (05) = 1.99$

df 96  
$a = -.70191$

Former College GPA in the third quarter prediction. The statistics in these tables are significant at the .05 level of confidence. The beta weight for the testing information showed a ratio of ten-to-one over the weight of Former College GPA.

Home Economics. Although with an N of 29, the Home Economics group still showed significant multiple $R$'s. The earlier information showed somewhat more effect from the testing information but Tables 37 and 38 indicate that the third quarter GPA reverses the trend;
Table 32

Prediction of Third Quarter GPA for Subgroup of Transfer Students to Commerce from ACT Composite and Former College GPA

\[
\begin{align*}
R &= .502 \\
R^2 &= .252 \\
N &= 99 \\
F &= 16.19
\end{align*}
\]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.42</td>
<td>.3931</td>
<td>.064800</td>
<td>4.44</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.31</td>
<td>.2819</td>
<td>.246416</td>
<td>3.18</td>
</tr>
</tbody>
</table>

\( t^* (05) = 1.99 \)
\( df = 96 \)
\( a = -.46030 \)

Former College GPA becomes the more important factor with more than twice as much effect in the prediction equation. These variations appear to be a factor of the small size of the group.

**Social Work.** The size of the group admitted to Social Work diminished from 27 to 18, a holding power of two-thirds, but none of the statistics were significant. It appeared that Former College GPA was nearly four times more effective in the prediction of OSU
Table 33

Prediction of First Quarter GPA for Subgroup of Transfer Students to Education from ACT Composite and Former College GPA

\[
R = 0.381 \quad R^2 = 0.145
\]

\[
N = 247 \quad F = 20.73
\]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>β</th>
<th>b</th>
<th>t_β*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.22</td>
<td>0.1598</td>
<td>0.024008</td>
<td>2.65</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.35</td>
<td>0.3169</td>
<td>0.328347</td>
<td>5.25</td>
</tr>
</tbody>
</table>

\[ t_\star (0.05) = 1.96 \]
\[ df = 244 \quad a = -1.34797 \]

achievement, as reported in Tables 39 and 40. ACT Composite had been found to be a negative factor in the prediction of OSU third quarter GPA. The data did not supply adequate statistics for findings of merit.

**Summary findings for the subgroup**

The conclusion of the findings for the subgroup of those transfer students admitted to OSU were based upon the regression
Table 34

**Prediction of Third Quarter GPA for Subgroup of Transfer Students to Education from ACT Composite and Former College GPA**

<p>|</p>
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>$r$ with criterion</th>
<th>$\beta$</th>
<th>$b$</th>
<th>$t_b^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.39</td>
<td>0.3279</td>
<td>0.043102</td>
<td>5.87</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.40</td>
<td>0.3415</td>
<td>0.309717</td>
<td>6.11</td>
</tr>
</tbody>
</table>

$t^* (0.05) = 1.96$

$df = 244$

$a = -0.95901$

analyses accomplished from the data through the third quarter of study. Approximately two-thirds of the entire group proceeded to complete this period amounting to one academic year.

Extending the findings with the five-variable and two-variable multiple regression analyses performed for the total group, it was learned that the two-variable approach was not significantly different in its prediction formulae. Therefore, only those two-variable statistics were reported for this subgroup. In general,
Table 35

Prediction of First Quarter GPA for Subgroup of Transfer Students to Engineering from ACT Composite and Former College GPA

\[ R = 0.470 \]
\[ R^2 = 0.221 \]
\[ N = 45 \]
\[ F = 5.97 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.44</td>
<td>0.4483</td>
<td>0.078685</td>
<td>3.29</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>-0.14</td>
<td>-0.1603</td>
<td>-0.137756</td>
<td>-1.18</td>
</tr>
</tbody>
</table>

\( t^* (05) = 2.02 \)
\( df = 42 \)
\( a = -1.05763 \)

The relationships were extended upward, although not appreciably more variance of the criterion was accounted for.

The findings for the entire subgroup indicated that both factors accounted for a contribution of nearly equivalent strength in the prediction equation. Former College GPA appeared to be the somewhat more important variable when compared to the longer-term effects of study through three quarters at OSU.
Table 36

Prediction of Third Quarter GPA for Subgroup of Transfer Students to Engineering from ACT Composite and Former College GPA

\[ R = 0.512 \quad \quad \quad R^2 = 0.263 \]
\[ N = 45 \quad \quad \quad F = 7.48 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_{b*} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>0.51</td>
<td>0.5071</td>
<td>0.087766</td>
<td>3.82</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.08</td>
<td>0.0568</td>
<td>0.048108</td>
<td>4.28</td>
</tr>
</tbody>
</table>

\( t^* (05) = 2.02 \)
\( df = 42 \)
\( a = -0.15487 \)

Differences from this general conclusion were apparent among the colleges and schools, tending to indicate the assurance for developing separate regression equations for individual programs of the university. Although the results were not significant for both Agriculture and Social Work again, the indications were strong that useful prediction was available for the other colleges and school. ACT Composite had been of more weight in the prediction for Commerce and Engineering, but Former College GPA was the dominant variable for Arts, Education, and Home Economics.
Table 37
Prediction of First Quarter GPA for Subgroup of Transfer Students to Home Economics from ACT Composite and Former College GPA

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>β</th>
<th>b</th>
<th>t_{b}^*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.65</td>
<td>.6071</td>
<td>.090471</td>
<td>4.45</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.40</td>
<td>.3195</td>
<td>.305046</td>
<td>2.34</td>
</tr>
</tbody>
</table>

\[ t^* (0.05) = 2.06 \]
\[ df = 26 \]
\[ a = .27055 \]

It was concluded from the findings that the diversity among the transfer students was supported by the completion of three quarters of study, as had been indicated for the whole group.

**Differences Within the Total Group**

Following analysis of the multiple regression analyses which had been computed for the total group and subgroup of transfer students, it developed that extension of the analysis of the variance would be necessary. This direction was undertaken to test the
Table 38

Prediction of Third Quarter GPA for Subgroup of Transfer Students to Home Economics from ACT Composite and Former College GPA

R = .700
N = 29

\( R^2 = .490 \)
\( F = 12.48 \)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>r with criterion</th>
<th>( \beta )</th>
<th>b</th>
<th>t_b*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.36</td>
<td>.2755</td>
<td>.037040</td>
<td>1.95</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.64</td>
<td>.6060</td>
<td>.521968</td>
<td>4.28</td>
</tr>
</tbody>
</table>

\( t^* (05) = 2.06 \)
\( df = 26 \)
\( a = -.37013 \)

hypothesis that a common population existed for each of the colleges within the total group. If the population were common, then the same prediction equation would be appropriate for every student wishing to be admitted to any college or school at OSU. If the population were found not to be similar in terms of ability, then individual multiple regression analyses would be the best predictors for students applying to certain colleges.

The statistical procedure employed to analyze these data was the analysis of critical ratio. Assuming there were no differences in mean ability indications, then the researcher would reject
Table 39

Prediction of First Quarter GPA for Subgroup of Transfer Students to Social Work from ACT Composite and Former College GPA

\[
R = .535 \quad R^2 = .286 \\
N = 18 \quad F = 3.00
\]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_b^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>.01</td>
<td>-.0614</td>
<td>-.012357</td>
<td>-.028</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>.53</td>
<td>.5390</td>
<td>.558013</td>
<td>2.45</td>
</tr>
</tbody>
</table>

\( t^* (05) = 2.13 \)

\( df = 15 \quad a = -1.52205 \)

the null hypothesis if differences were found to be significant at the .05 level of confidence. The formulation applied is cited by Garrett as the ratio of the difference between means and the standard error of the means.

\(^6Garrett, \textit{op. cit.}, \text{pp.} 213-16.\)
Table 40

Prediction of Third Quarter GPA for Subgroup of Transfer Students to Social Work from ACT Composite and Former College GPA

\[ R = 0.383 \quad R^2 = 0.146 \]

\[ N = 18 \quad F = 1.29 \]

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>( r ) with criterion</th>
<th>( \beta )</th>
<th>( b )</th>
<th>( t_{b^*} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite</td>
<td>-0.02</td>
<td>-0.0666</td>
<td>-0.013143</td>
<td>-0.28</td>
</tr>
<tr>
<td>Former College GPA</td>
<td>0.38</td>
<td>0.3852</td>
<td>0.390815</td>
<td>1.60</td>
</tr>
</tbody>
</table>

\( t^* (0.05) = 2.13 \)

\( df = 15 \quad a = -1.90184 \)

These statistics were derived and are reported in Table 41.

The general conclusion for the findings of this table is that there were differences among the college and school populations of this study group, significant at the 0.05 level of confidence. It appeared that perhaps Agriculture, Commerce and Social Work were not significantly different from the total group, but each other division was. In the differences between two independent means the College of Arts and Sciences population varied significantly from each other classification. The College of Engineering also varied significantly on this measurement of ability to perform college-level work. Other
Table 41

Differences of Mean ACT Composite Between Colleges for Total Group of Transfer Students

<table>
<thead>
<tr>
<th></th>
<th>AGR</th>
<th>ART</th>
<th>COM</th>
<th>EDU</th>
<th>ENG</th>
<th>HEC</th>
<th>SWK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR</td>
<td>2.83a</td>
<td>.79</td>
<td>.83</td>
<td>4.98a</td>
<td>.17</td>
<td>1.01</td>
<td>1.48</td>
<td></td>
</tr>
<tr>
<td>ART</td>
<td>3.61a</td>
<td>7.65a</td>
<td>4.05a</td>
<td>2.27a</td>
<td>4.95a</td>
<td></td>
<td></td>
<td>3.91a</td>
</tr>
<tr>
<td>COM</td>
<td>2.81a</td>
<td>5.99a</td>
<td>.50</td>
<td>1.85</td>
<td></td>
<td></td>
<td></td>
<td>1.20</td>
</tr>
<tr>
<td>EDU</td>
<td></td>
<td>8.44a</td>
<td>.96</td>
<td>.55</td>
<td></td>
<td></td>
<td></td>
<td>5.33a</td>
</tr>
<tr>
<td>ENG</td>
<td></td>
<td></td>
<td>6.35a</td>
<td>5.33a</td>
<td></td>
<td></td>
<td></td>
<td>6.09a</td>
</tr>
<tr>
<td>HEC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.11</td>
<td></td>
<td>1.07</td>
</tr>
<tr>
<td>SWK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.45a</td>
</tr>
</tbody>
</table>

N: 50 569 171 352 72 37 27 1278
Mean: 21.46 23.04 21.93 20.98 24.76 21.60 20.59 22.27
S.D.: 3.78 3.87 3.41 4.03 3.34 3.72 3.52 3.96

*Significant at .05 level of confidence.

Colleges varied significantly with some other groups. The College of Commerce and Administration varied significantly with Arts, Education, and Engineering. The College of Education varied at a significant level with Arts, Commerce, and, particularly, Engineering. The other programs in Agriculture, Home Economics, and Social Work were composed of smaller populations forcing the statistical conclusions to be highly qualified and unpredictable. Agriculture varied significantly from the populations in Arts and Engineering; Home Economics varied
with Arts and Engineering; and Social Work varied with the Arts and Engineering populations.

Therefore, the findings of the analysis of difference of the independent means do not support the null hypothesis; no differences is not true. Particularly because the variance at significant levels was reflected in the populations of the larger colleges, the findings are favorable to the development of individual prediction equations for the colleges and schools. Credence is given to the emphasis of differences among specialized programs.

The next section reports the findings of the distributions of the other factors which had been gathered concerning the total group of transfer students.

**Findings of the Other Factors**

The findings of the other factors employed in this study are reported in this section. The data were analyzed from frequency distributions utilizing the N of the sample, the cumulative frequency, the sums of the raw scores, and the means. These have been depicted in tabular style according to the following factors:

1. Level of colleges attended
2. Number of colleges attended
3. Identification of common colleges
4. High school decile standing
5. Age

These five factors are described in the next subsections.
Level of colleges attended

The level of colleges attended refers to the classification system employed by the U. S. Office of Education to cite the level of the highest degree or professional certificate offered. Class I is that of the junior-community college; Class II represents the four-year baccalaureate degree college; Class III colleges offer the master's degree; and Class IV colleges and universities offer the doctorate degree. More than 90 per cent of the transfer students came from Levels II, III, and IV. Only 8.3 per cent were transfers from junior or community college programs. On the standing these students had earned in their earlier studies, the junior college students stood highest with the other levels decreasing in line. Differences did not appear to be extreme as indicated in Table 42. But in earning first quarter marks at OSU the trend line was nearly reversed; junior college students had actually accumulated a mean GPA less than 2.00. On the basis of comparison for the total group on ACT Composite, the junior college students with a 19.30 mean were nearly three standard score points below the average of the students in the other three levels of college background.

Further findings reported in Table 42 revolve around the descriptive data for those who finished three quarters at OSU. These data emphasize the trends of the larger group outlined above. More than half of the Level I students were lost before finishing three quarters, whereas the figures fluctuated around one-third for losses in the colleges of the other levels. The former college standings
Table 42

Level of Colleges Attended by Transfer Students Related to Performance and Ability

<table>
<thead>
<tr>
<th></th>
<th>I. Junior-Community College</th>
<th>II. Baccalaureate College</th>
<th>III. Master's degree College</th>
<th>IV. Doctorate degree College</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=1278</td>
<td>106</td>
<td>373</td>
<td>303</td>
<td>496</td>
</tr>
<tr>
<td>%</td>
<td>8.3</td>
<td>29.2</td>
<td>23.7</td>
<td>38.8</td>
</tr>
<tr>
<td>Former College GPA Mean</td>
<td>2.296</td>
<td>2.279</td>
<td>2.204</td>
<td>2.185</td>
</tr>
<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>1.854</td>
<td>2.239</td>
<td>2.442</td>
<td>2.393</td>
</tr>
<tr>
<td>ACT Composite Mean</td>
<td>19.30</td>
<td>22.11</td>
<td>22.58</td>
<td>22.93</td>
</tr>
<tr>
<td><strong>Subgroup</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=856</td>
<td>50</td>
<td>237</td>
<td>214</td>
<td>355</td>
</tr>
<tr>
<td>%</td>
<td>5.8</td>
<td>27.7</td>
<td>25.0</td>
<td>41.5</td>
</tr>
<tr>
<td>Former College GPA Mean</td>
<td>2.448</td>
<td>2.357</td>
<td>2.272</td>
<td>2.235</td>
</tr>
<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>2.336</td>
<td>2.623</td>
<td>2.674</td>
<td>2.636</td>
</tr>
<tr>
<td>OSU Third Qtr. GPA Mean</td>
<td>2.216</td>
<td>2.532</td>
<td>2.548</td>
<td>2.545</td>
</tr>
<tr>
<td>ACT Composite Mean</td>
<td>20.18</td>
<td>22.89</td>
<td>23.00</td>
<td>23.33</td>
</tr>
</tbody>
</table>

were lifted somewhat by these "successful" students indicating that higher previous achievement is likely to continue. Again for first and third quarter comparison for the subgroup the junior college group was different from the other three levels. More of the continuing students were earning "B-" level marks rather than "C" level GPA. The information on the means of ACT Composite affirm the similar relationship found above; nearly no differences appear to exist between Levels II, III, and IV in ability and indications of performance.
However, the data for the small group counted from junior-community colleges suggest that differences may exist which could necessitate special review and handling.

**Number of colleges attended**

The number of colleges attended had been tallied for those transfer students admitted to OSU during 1964. It appeared that no observable differences in the proportions of this activity could be found. Four-fifths of the total group and subgroup had attended one college only. Two was considered somewhat common, but attendance at three, four, or six was indicated for a small minority. No differences in the other factors reported in Table 43 could be detected; indications of ability and performance did not appear to vary in noticeable manner. No pattern existed.

**Identification of common colleges**

Colleges within the state boundaries had been identified as common to transfer from, although the samples were negligible for Cuyahoga Community College and Fenn College, the latter now identified as The Cleveland State University. The two colleges sending most students to transfer to OSU were Miami University and Ohio University. Table 44 shows that 97 and 94 transfer students were admitted, respectively. In general, the former college record did not vary much from the average figure, except for students from University of Cincinnati. For the total group, the evidence for these nine college
Table 43
Number of Colleges Attended by Transfer Students Related to Performance and Ability

<table>
<thead>
<tr>
<th>Number of Colleges</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1278</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>80.0</td>
<td>16.7</td>
<td>2.4</td>
<td>0.7</td>
<td>0.1</td>
</tr>
<tr>
<td>Former College GPA Mean</td>
<td>2.216</td>
<td>2.239</td>
<td>2.358</td>
<td>2.633</td>
<td>2.300</td>
</tr>
<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>2.302</td>
<td>2.351</td>
<td>2.484</td>
<td>2.400</td>
<td>2.400</td>
</tr>
<tr>
<td>ACT Composite Mean</td>
<td>22.29</td>
<td>22.43</td>
<td>22.39</td>
<td>22.22</td>
<td>18.00</td>
</tr>
<tr>
<td><strong>Subgroup</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>856</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>80.6</td>
<td>16.3</td>
<td>2.5</td>
<td>0.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Former College GPA Mean</td>
<td>2.279</td>
<td>2.271</td>
<td>2.514</td>
<td>2.625</td>
<td>2.300</td>
</tr>
<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>2.602</td>
<td>2.662</td>
<td>2.848</td>
<td>2.775</td>
<td>2.400</td>
</tr>
<tr>
<td>OSU Third Qtr. GPA Mean</td>
<td>2.514</td>
<td>2.504</td>
<td>2.671</td>
<td>2.825</td>
<td>2.400</td>
</tr>
<tr>
<td>ACT Composite Mean</td>
<td>22.95</td>
<td>22.67</td>
<td>22.48</td>
<td>24.25</td>
<td>18.00</td>
</tr>
</tbody>
</table>

groups showed some variation. Bowling Green State University, Cuyahoga Community College, and Ohio University were the sources of students who did not establish GPA's above 2.2, on the average. Ohio Wesleyan University, Wittenberg University, Fenn College, and Miami University supplied students to OSU who earned averages with means above 2.4. The ACT Composite means for the total group did not appear to deviate markedly. Two private colleges, Ohio Wesleyan and Wittenberg, showed
Table 44
Identified Colleges Attended by Transfer Students
Related to Performance and Ability

<table>
<thead>
<tr>
<th></th>
<th>Bowling Green S.U.</th>
<th>Univ. of Cincinnati</th>
<th>Cuyahoga C.C. College</th>
<th>Kent St.</th>
<th>Miami Univ.</th>
<th>Ohio Univ.</th>
<th>Wittenberg Univ.</th>
<th>All Others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=1278</td>
<td>43</td>
<td>44</td>
<td>5</td>
<td>11</td>
<td>44</td>
<td>97</td>
<td>94</td>
<td>23</td>
</tr>
<tr>
<td>%</td>
<td>3.4</td>
<td>3.4</td>
<td>0.4</td>
<td>0.9</td>
<td>3.4</td>
<td>7.6</td>
<td>7.4</td>
<td>1.8</td>
</tr>
<tr>
<td>Former College</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA Mean</td>
<td>2.284</td>
<td>2.032</td>
<td>2.280</td>
<td>2.400</td>
<td>2.207</td>
<td>2.176</td>
<td>2.186</td>
<td>2.265</td>
</tr>
<tr>
<td>OSU First Qtr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA Mean</td>
<td>2.012</td>
<td>2.264</td>
<td>2.040</td>
<td>2.500</td>
<td>2.225</td>
<td>2.410</td>
<td>2.185</td>
<td>2.804</td>
</tr>
<tr>
<td>ACT Composite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>21.47</td>
<td>22.28</td>
<td>21.40</td>
<td>22.73</td>
<td>20.93</td>
<td>22.34</td>
<td>22.02</td>
<td>23.22</td>
</tr>
<tr>
<td><strong>Subgroup</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=856</td>
<td>30</td>
<td>29</td>
<td>4</td>
<td>8</td>
<td>31</td>
<td>70</td>
<td>56</td>
<td>19</td>
</tr>
<tr>
<td>%</td>
<td>3.5</td>
<td>3.4</td>
<td>0.5</td>
<td>0.9</td>
<td>3.6</td>
<td>8.2</td>
<td>6.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Former College</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA Mean</td>
<td>2.330</td>
<td>2.110</td>
<td>2.500</td>
<td>2.588</td>
<td>2.290</td>
<td>2.313</td>
<td>2.251</td>
<td>2.158</td>
</tr>
<tr>
<td>OSU First Qtr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA Mean</td>
<td>2.133</td>
<td>2.521</td>
<td>2.225</td>
<td>2.838</td>
<td>2.594</td>
<td>2.590</td>
<td>2.488</td>
<td>2.800</td>
</tr>
<tr>
<td>OSU Third Qtr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA Mean</td>
<td>2.200</td>
<td>2.476</td>
<td>2.150</td>
<td>2.638</td>
<td>2.503</td>
<td>2.570</td>
<td>2.426</td>
<td>2.700</td>
</tr>
<tr>
<td>ACT Composite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>21.27</td>
<td>22.69</td>
<td>20.00</td>
<td>22.75</td>
<td>21.10</td>
<td>22.54</td>
<td>21.93</td>
<td>22.58</td>
</tr>
</tbody>
</table>
the highest mean scores. Kent State University's group offered the lowest standing on the testing information with a mean under 21.

The information on the subgroup of 856 students showed no great fluctuation in proportions from the total group who had succeeded into their third quarters. Those who had earned higher marks in their studies at former colleges were more likely to complete their third quarters at OSU, except for Ohio Wesleyan and Wittenberg. For the latter pair, the former GPA showed a drop for the third quarter group compared with the entire group. Attrition in the size of the group appeared to hit students from Ohio somewhat more than those from Miami. Their OSU GPA's showed higher standing in their first quarter records than the entire group but then slipped down to adequate but lower mean standing. No special differences in the changes of ACT Composite means could be established. Because of the sameness of ability indicators for first and then third quarter standing, it may be surmised that other factors of achievement motivation and aspiration level may be operating for the students and against the prediction evidence. No pronounceable difficulties with the processing of students from certain colleges seem to be supported from the limited data presented in this composite of description. No observable pattern came to the fore.

High school decile standing

The information in Table 45 outlines the pattern of high school decile standing with collegiate success, both the former and present. Not so many of the entire group showed a high school standing, but more
<table>
<thead>
<tr>
<th></th>
<th>Top</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=1037</td>
<td>162</td>
<td>174</td>
<td>158</td>
<td>140</td>
<td>96</td>
<td>96</td>
<td>73</td>
<td>58</td>
<td>42</td>
<td>38</td>
</tr>
<tr>
<td>%</td>
<td>15.6</td>
<td>16.8</td>
<td>15.2</td>
<td>13.5</td>
<td>9.3</td>
<td>9.3</td>
<td>7.0</td>
<td>5.6</td>
<td>4.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Former College GPA Mean</td>
<td>2.632</td>
<td>2.385</td>
<td>2.168</td>
<td>2.228</td>
<td>2.100</td>
<td>2.072</td>
<td>1.989</td>
<td>2.041</td>
<td>2.031</td>
<td>1.808</td>
</tr>
<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>2.866</td>
<td>2.594</td>
<td>2.367</td>
<td>2.358</td>
<td>2.022</td>
<td>1.979</td>
<td>2.044</td>
<td>1.676</td>
<td>1.700</td>
<td>1.766</td>
</tr>
<tr>
<td>ACT Composite Mean</td>
<td>25.03</td>
<td>23.53</td>
<td>22.75</td>
<td>22.02</td>
<td>21.60</td>
<td>21.03</td>
<td>20.51</td>
<td>19.12</td>
<td>19.64</td>
<td>18.08</td>
</tr>
<tr>
<td><strong>Subgroup</strong></td>
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<td></td>
</tr>
<tr>
<td>N=704</td>
<td>138</td>
<td>137</td>
<td>113</td>
<td>109</td>
<td>54</td>
<td>51</td>
<td>44</td>
<td>25</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>%</td>
<td>19.6</td>
<td>19.5</td>
<td>16.1</td>
<td>15.5</td>
<td>7.7</td>
<td>7.2</td>
<td>6.3</td>
<td>3.5</td>
<td>2.5</td>
<td>2.1</td>
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<tr>
<td>Former College GPA Mean</td>
<td>2.630</td>
<td>2.375</td>
<td>2.168</td>
<td>2.282</td>
<td>2.106</td>
<td>2.073</td>
<td>2.098</td>
<td>2.132</td>
<td>2.028</td>
<td>1.520</td>
</tr>
<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>2.929</td>
<td>2.751</td>
<td>2.549</td>
<td>2.545</td>
<td>2.380</td>
<td>2.388</td>
<td>2.461</td>
<td>2.152</td>
<td>2.344</td>
<td>2.466</td>
</tr>
<tr>
<td>OSU Third Qtr. GPA Mean</td>
<td>2.852</td>
<td>2.637</td>
<td>2.471</td>
<td>2.448</td>
<td>2.254</td>
<td>2.357</td>
<td>2.316</td>
<td>2.160</td>
<td>2.250</td>
<td>2.080</td>
</tr>
<tr>
<td>ACT Composite Mean</td>
<td>25.17</td>
<td>23.59</td>
<td>22.72</td>
<td>22.20</td>
<td>21.89</td>
<td>21.41</td>
<td>20.75</td>
<td>19.92</td>
<td>20.06</td>
<td>19.33</td>
</tr>
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</table>
than 80 per cent did. Nearly one-half of the group had had upper-
third high school standing; less than thirty per cent had come from the lower half of their high school classes.

For the entire group the indications of mean GPA for former college studies neatly dropped down from the top ten per cent group with a 2.6 GPA through the seventh decile with less than a 2.00. The next two groups raised the mean GPA above "C" level and changed the trend. A similar trend was observable in the total group's OSU standing; in general, students in the upper half of their high school classes were established in deciles with mean GPA above 2.00. The ACT Composite also made this regular falling-off trend line from 25 for the top to 18 for the bottom.

The subgroup was composed of slightly more students from the upper third of their high school classes, indicating that more of the leavers from OSU came from lower standing. The same descending order of the data for the total group above was observed for the subgroup in the indications of first and third quarters at OSU, former college standing, and ACT Composite mean. It would appear that the relationship would be linear in statistical description.

Age

The last factor descriptive of the transfer students concerned the relationship of their age to indicators of performance and ability. These data are observed in Table 46. The data were not available for seventy but are reported for 1,208. The median age was twenty years
### Table 46

Age of Transfer Students in 1964 Related to Performance and Ability

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Total Group</strong></td>
<td>1208</td>
<td>23</td>
<td>335</td>
<td>377</td>
<td>206</td>
<td>106</td>
<td>59</td>
<td>32</td>
<td>43</td>
<td>14</td>
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<tr>
<td>N</td>
<td>1.9</td>
<td>27.7</td>
<td>31.2</td>
<td>17.0</td>
<td>8.8</td>
<td>4.9</td>
<td>2.6</td>
<td>3.5</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Former College GPA Mean</td>
<td>2.287</td>
<td>2.248</td>
<td>2.194</td>
<td>2.142</td>
<td>2.182</td>
<td>2.325</td>
<td>1.922</td>
<td>2.214</td>
<td>2.786</td>
<td>2.269</td>
</tr>
<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>2.061</td>
<td>2.297</td>
<td>2.263</td>
<td>2.247</td>
<td>2.372</td>
<td>2.598</td>
<td>2.247</td>
<td>2.154</td>
<td>2.821</td>
<td>2.439</td>
</tr>
<tr>
<td>ACT Composite Mean</td>
<td>22.30</td>
<td>22.37</td>
<td>22.38</td>
<td>22.18</td>
<td>22.03</td>
<td>21.05</td>
<td>21.97</td>
<td>21.58</td>
<td>22.93</td>
<td>22.54</td>
</tr>
<tr>
<td><strong>Subgroup</strong></td>
<td>802</td>
<td>12</td>
<td>238</td>
<td>242</td>
<td>140</td>
<td>70</td>
<td>41</td>
<td>19</td>
<td>22</td>
<td>12</td>
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<tr>
<td>N</td>
<td>1.5</td>
<td>29.7</td>
<td>30.2</td>
<td>17.5</td>
<td>8.7</td>
<td>5.1</td>
<td>2.4</td>
<td>2.7</td>
<td>1.5</td>
<td>0.7</td>
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<tr>
<td>Former College GPA Mean</td>
<td>2.275</td>
<td>2.337</td>
<td>2.253</td>
<td>2.181</td>
<td>2.251</td>
<td>2.239</td>
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<td>2.441</td>
<td>2.842</td>
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<tr>
<td>OSU First Qtr. GPA Mean</td>
<td>2.675</td>
<td>2.577</td>
<td>2.598</td>
<td>2.554</td>
<td>2.714</td>
<td>2.754</td>
<td>2.668</td>
<td>2.664</td>
<td>3.192</td>
<td>2.517</td>
</tr>
<tr>
<td>OSU Third Qtr. GPA Mean</td>
<td>2.583</td>
<td>2.490</td>
<td>2.501</td>
<td>2.466</td>
<td>2.513</td>
<td>2.471</td>
<td>2.547</td>
<td>2.600</td>
<td>2.925</td>
<td>2.817</td>
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<tr>
<td>ACT Composite Mean</td>
<td>24.08</td>
<td>23.01</td>
<td>22.84</td>
<td>22.70</td>
<td>22.61</td>
<td>21.63</td>
<td>23.05</td>
<td>22.41</td>
<td>23.33</td>
<td>22.17</td>
</tr>
</tbody>
</table>
old with only 23 aged eighteen and approximately 100 aged twenty-five or older. These data seemed to indicate that the transfer student had been on schedule for the extent of his studies; he was approximately twenty years old and studying in his second year of college. The record of the former college studies do not clearly establish any marked differences across the age distribution. The 32 born in 1940 had established an average of 1.922, somewhat below the required 2.00, but the age groups on either side showed more typical performance. The 14 people aged thirty to forty had had standings averaging 2.786, but the small number may be sufficient explanation for the extraordinary average. In the comparison of the first quarter performances at OSU no certain trend was indicated. The youngest group showed the lowest standing while those born in 1940, who had had lowest standing in their former studies, had now earned average standing compared to the rest of the population. The highest standing was shown by the thirty-to-forty group. The ACT Composite means showed little or no variation across the intervals.

When the additional information from the subgroup was considered it was apparent that there were no differences in the proportionate parts of the group contributed by each age interval. The former record of the total group and the subgroup were nearly the same. But comparison of the first quarter GPA with the third indicated that those who continued had established themselves with a strong beginning which was sequentially stabilized at a somewhat lower level. The ACT Composite showed a slight lifting, typically one standard score point. The
findings for possible relationship of age as a factor of effect or interest did not determine clear patterns to be tested further.

Summary of other factors

This section of the study has reviewed the distributions of the data which are descriptive of other factors about the transfer students. The prominent findings provide more understandings about the background of these persons. Typically there appear to be no differences among the four-year or higher colleges and universities, but the group of students in this study from junior or community colleges were found to be somewhat different. Their marks had been as high or higher in their former studies, yet indications of ability had not been proportionate. Their performance and rate of continuance at OSU were not up to the average level of the study population as a whole. No information of differences was contributed from the question of the number of colleges a student had attended. Only a few notes of special interest came from the information about the various identified colleges in Ohio sending more transfer students to OSU; some differences were apparent but the restrictions of the size of the sample may also have had effects. The ranking of the high school decile contributed neat progressions indicating a close relationship of former college studies, rank in high school studies, ability to do college-level study, and the marks earned at OSU. The final factor of age did not garner findings of prominent effect.

The summary of these findings appears to focus emphasis upon the factors of ability, past performance, and level of the college
program. The identification of certain colleges and age did not appear to be factors so clearly contributing to prediction of success in achievement at OSU.

The next section reviews the findings which reflected the differences in the transfer students approved by regular and special procedures for admission.

Findings on Regular and Special Action Admissions

The fourth purpose for the study emphasized the admissions procedures employed to differentiate those who have not succeeded in their former college studies but are determined to be worthy of an additional opportunity for college study at OSU. Students in this study who had earned a 2.00 average or higher in former studies were approved under provisions for regular admission. Those admitted with less than 2.00 standing had had to meet certain criteria which were outlined in the definitions for this study.

The information of Table 47 reports the findings concerning the relationship for this study group of regular and special action admissions to indications of ability and performance. In overall effect the special action admissions constituted 27.6 per cent of the total group of 1,278 students. Two-thirds of these 353 special action admissions had earned 1.5 to 1.9 GPA in their former studies. The information from the subgroup 1.5 to 1.9 GPA's who had completed their third quarters of study showed that a slightly smaller proportion of
Table 47
Relationship of Regular and Special Action Admissions
of Transfer Students to Ability and Performance

<table>
<thead>
<tr>
<th></th>
<th>Total Group N=1278</th>
<th>Subgroup N=856</th>
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<tr>
<td></td>
<td>OSU</td>
<td>OSU</td>
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<tr>
<td></td>
<td>1st Qtr.</td>
<td>1st Qtr.</td>
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<tr>
<td></td>
<td>GPA Mean</td>
<td>Composite</td>
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<td>Special Action</td>
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<td></td>
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<tr>
<td>Admissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0-0.9</td>
<td>31</td>
<td>2.055</td>
</tr>
<tr>
<td>1.0-1.4</td>
<td>85</td>
<td>1.994</td>
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<td>50</td>
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<td>Regular Admissions</td>
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</tr>
<tr>
<td>2.0</td>
<td>125</td>
<td>2.079</td>
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<tr>
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<td>58</td>
<td>2.369</td>
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<tr>
<td>2.6-3.0</td>
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<tr>
<td>3.1-4.0</td>
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<td>Special Action</td>
<td>Total</td>
<td>353</td>
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<tr>
<td>Admissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular Admissions</td>
<td>Total</td>
<td>925</td>
</tr>
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the group had been admitted under special action; 25.1 per cent, or 215 persons, had completed an academic year of study.

The tabular information indicates clearly that the 2.00 level marked the point of change in the admissions policy. For the GPA interval the number of admissions at 1.9 was 50; at 2.0 the N was 125. The table does not report the intervals in equal steps so that the extremes with their small sizes could also be viewed in individual intervals. The material was organized to study the effects of former college GPA in either direction from the employed cutting-off standard but not at the extremes. In terms of first quarter performance at OSU, these interval means indicate that students who had been at the 1.8 and 1.9 levels earned higher standing than those at 2.0, 2.1, and 2.2 in their former studies. In fact, the group selected under special conditions performed academically quite as well as the group admitted under regular proceedings who had earned from 2.0 to 2.5 in their former studies. This same feature of academic performance was reaffirmed through the three-quarter group record. The special action group was able to do as well as those who had earned from 2.0 to 2.3 in their former college record.

Except for the effects cited above on special action admissions, the relationship appeared to exist between former achievement and present at about proportionate or equal level. Former 3.0 students were still earning 3.0's in OSU work, and the same was true for 2.5 students. But for one-fourth of the group who had had special consideration this subgroup had former records not apparently related proportionately to their OSU first and third quarter GPA's.
Information on ACT Composite indicates that the selection through special action emphasizes the addition of testing results to the former record. The mean ACT Composite at the intervals for the special action students ranged from 22.31 up to 24.35; for the regular students this range at intervals was from 20.70 to 24.59. The results for the "C" students indicate that satisfactory achievement, although little more than 2.00, may be achieved without commensurate ability as indicated by scholastic aptitude measures. For the students admitted under regular procedures the ACT Composite scores marched regularly up from the 2.0 level to the 3.0; in comparison the ACT Composite scores for the special action group did not show this trend and appeared to be average to high across the subgroup. In fact, for this entire group of third quarter students the highest mean ACT Composite for the complete range, as grouped in Table 47, was reported for the 1.5 students.

In summary, the division of the total group into two classes was accomplished on the standing of former college studies. This division matched the admissions policies requiring a 2.00 for admission under regular procedures. The holding power of the categories of admission did not vary appreciably. The overall comparison of the statistics indicating ability and performance for the special and regular groups indicates higher mean scores on the testing instrument for the special action group and higher mean performance according to GPA for the first and third quarters by group admitted under regular procedures. For the total group the special action admissions had an ACT
Composite mean standard score of 22.95 with GPA in first quarter of 2.144. In contrast the regularly admitted group showed an ACT Composite of 22.04 with achievement of 2.373. For the subgroup who had completed three quarters of study a similar contrast was apparent. The special action group had a mean ACT Composite of 23.50, had earned a 2.526 in their first quarters, and lowered this record to 2.342 in their third quarters. The regularly admitted group had an ACT Composite mean standard score of 22.67 with first quarter GPA of 2.646 and third quarter of 2.571. The findings support the appearance of the relationship of success as a student reinforcing continued success somewhat regardless of the possibilities for equivalent standing on the ability measure. For the special action group a pattern of underachievement appears to be evident both in former and continuing records. These findings are derived from analysis of the means representing the population of the study group and do not represent the fact that exceptions in either end of the range to the described pattern were observed.

The findings do determine that many students given the special consideration in approval for admission have earned records substantially equivalent to the regular student body. Evidently changes in former patterns for individual students have been established under this special opportunity.

The next chapter concludes the report of this study with a summary of the study and its findings, some conclusions, and recommendations for further study.
CHAPTER V

SUMMARY AND CONCLUSIONS

The problem for this study had been twofold in nature. The first intention had been to describe the advanced undergraduate student who transfers to OSU. The second feature had been to develop predictive criteria for utilization in the admission of these students into specific colleges and schools of the university. The purpose of the study was met in the development of a body of knowledge about the transfer students to OSU and would be of additional value in implementation into the process of admissions. This utilization would be effective for the university and for individual students, especially.

The specific purposes for the study dealt with the effectiveness of certain intellectual variables as predictors of academic success. These were to determine the effectiveness of (1) previous academic performance, and (2) ACT in the prediction of success at OSU as determined by GPA in the first and third quarters. An additional purpose was concerned with the differences of performance related to (3) other factors available for study. The final purpose for the study reflected the comparison of those admitted under (4) regular and special procedures.
Summary of the Study

The population for the study included 1,278 students who had transferred to OSU during 1964 as regular undergraduate degree candidates. This total group registered for and completed their first quarter of study. An additional group was identified who continued through their third quarters of study at OSU; this subgroup numbered 856.

The data for each student were collected from official high school and college transcripts, application information, and university records. The results of the American College Test (ACT), the grade point averages (GPA) for former college studies, and first and third quarters at OSU were required for each transfer student.

The collected data were coded and key-punched into Hollerith work cards for initial handling. Frequency distributions were tabulated and analyzed. Multiple regression analyses were then applied to the data on the IBM 7094 computer. The correlations were tested for statistical significance at the .05 level of confidence.

The multiple regression analysis was employed to determine the effectiveness of former college record and ACT in the prediction of first and third quarter GPA at OSU.

Forty-eight multiple regression analyses were computed for the total group and subgroup by college against the criteria of first and third quarter GPA's. The significance of the multiple regression coefficient (R) was tested by inspection of the F variance ratio. The
significance of the regression weight \( b \) was interpreted by the "t" test. Differences between the R's were determined by converting to Fisher's function, computing the ratio between the difference and the standard error of the difference, and testing for the significance of the ratio.

**Summary of the Findings**

The typical transfer student appeared to have completed nearly one-and-one-half years of college study with a standing of 2.26 before transfer to OSU. He entered the lower division at OSU and in the first quarter earned a 2.35 GPA. His achievement appeared to be comparable to that of all OSU students. Information from the testing results indicated that the transfer student showed mean performance of student appeared to be substantially similar to the OSU norms.

**Summary for the total group**

The predictive effectiveness of the former college studies and ACT was analyzed through the multiple regression equation for the total group. The regression analyses utilized a five-variable approach with the ACT subtest and Former College GPA and a two-variable approach with the ACT Composite and Former College GPA. The multiple R's for the five-variable and two-variable equations were nearly the same, .488 and .474, respectively. Analysis of the effects of the subtests indicated that each showed a regression weight significant at the .05 level of confidence; however, the effects of the English subtest and
Former College GPA were twice as important in the prediction equation as the other three subtests. Study of the two-variable regression analysis showed that ACT Composite was somewhat more dominant in contributing to the prediction equation, but that each factor contributed significant proportions.

The analysis of these five-variable and two-variable approaches were reported for each college or school within the university population. These results indicated that significant results were found for the colleges with the larger groups, but that two small programs showed less validity. One program with small size had extremely high relationships and showed consequent significant predictive statistics. For persons in Agriculture in this study, the small size of the sample restricted the predictability; few of the results were significant at the accepted level of confidence. But in Arts and Sciences, the size of the group was large enough (569) to provide meaningful predictive equations, which emphasized the contributions of the verbal information. Commerce showed somewhat erratic prediction with the multiple R down to .410; it appeared that the former record of achievement was not particularly useful in evaluating the credentials of an applicant to the Commerce program. In Education, the large sample supported findings similar to those for Arts and Sciences; a high, nearly balanced relationship was found between testing information and former college record. The group who entered the engineering program as transfer students showed a negative relationship between their former studies and their
record at OSU; the correlation was -.01. The greatest contributions in the five-variable approach came from the reading subtests in Natural Science and Social Studies. On the two-variable approach testing information from the ACT Composite was the important element in the prediction equation. Home Economics had a small size but showed a relationship of such magnitude ($R= .867$) that all regression weights except ACT Mathematics were significant, and in the two-variable approach testing and former record shared the equality of their relative weights. None of the statistics for Social Work showed significance levels which would be accepted at the .05 standard; this appeared to be due to the small size of the sample.

The conclusions of this section of the prediction equations established that the five-part approach showed slightly more effect in prediction but the two-variable system was nearly equivalent. The check of this through analysis of the critical ratio of the differences of the multiple correlation coefficients determined that the two approaches did not vary significantly. Either approach performed the prediction adequately for the population involved. The overall relationship of testing information and record of former studies showed relatively equivalent standing. However, there were peculiar differences for some of the specialized programs of some of the colleges.

**Summary for the subgroup**

The findings for the subgroup of transfer students emphasized apparent differences which were related to continuance through the third quarter of study at OSU. Of the original 1,278, there were 856 who
completed records for one academic year. The first citation of effect clearly established that those who continued for the longer period had earned higher standing in the initial quarter than those who did not continue. Then this cumulative average stabilized and settled. The effect of this pattern showed itself in the correlations for this subgroup in their first quarter; the R's were lower because of the narrowing of the population. The R's then returned to the level shown for the total group when the third quarter cumulative average was studied because the group had extended its range by lowering its performance somewhat.

Analysis of the critical ratio of the multiple correlation coefficients for the two approaches established that as before the five-variable and two-variable methods were not different in effectiveness of prediction. The multiple R for the two-variable approach was .500. Greater weight from the testing information was provided in the prediction of the subgroup's first quarter performance, but as the period of study was extended the relationship of former college studies increased in importance.

For the colleges and schools included in the study, similar conditions were observed for the subgroup as have been reported for the total group. Agriculture with a small size and variation in relationship did not show predictive information which could be judged to be significant. Arts and Sciences represented the overall relationship of the former college record becoming ascendent as a longer period of study is completed. Commerce showed variation from the conclusions
for the overall group; it appeared that testing information may provide more predictive effect than the record of former studies. For students in Education, the reverse relationship was observed. Then with an improving predictive relationship the students in Engineering appear to reverse the trend of Arts and Education students; the testing information is the more effective contributor to the prediction equation at a ten-to-one ratio. Perhaps the small size of the sample in Home Economics was responsible for the diverse shift in the relationship, albeit significant; testing had been twice as important for the subgroup successful in their first quarters, but former college GPA was twice as important for prediction of the third quarter cumulative average. The statistics for Social Work were not significant because of the small size of the population.

The findings for this subgroup population indicated that both variables accounted for nearly equivalent factors in the prediction equation. The effect of former college GPA was becoming more important as the length of study was extended. But differences between colleges and schools developed prominence. ACT Composite had been more important in the prediction for Commerce and Engineering while former college GPA was the dominant variable for Arts, Education, and Home Economics.

**Summary of differences within the total group**

Through the multiple regression analyses it became apparent that the multiple regression analysis for the total group would not be appropriate to provide the prediction equations for individual colleges
or schools. The analysis of the differences within the total group was undertaken to test the commonality of the population in terms of ability. The analysis of the critical ratio of the differences between these groups established that, although Agriculture, Commerce, and Social Work were not significantly different from the total group, each other college or school was. The findings were favorable to the development of individual prediction equations for each college or school.

Summary of the other factors

Information on the level of the former college appeared to support no effect of difference for transfer students from other four-year or higher colleges and universities. But students transferring from junior or community colleges might be expected to earn lower standing at OSU than they had previously established. The relationship of testing information and former record appeared to be nearly equivalent for the higher level colleges but not for the two-year colleges; higher marks were earned with lower ability in these institutions than was true for the other classifications.

The number of colleges a transfer student has attended did not appear to offer conclusive information for this population. The comparison of means showed no reportable differences.

The findings concerning other colleges in Ohio showed some indications of differences on institutional basis. The two private colleges showed somewhat higher ability and performance indications. The state
universities did not contribute populations to OSU very different from average for the total group.

The high school decile standing generated a neat progression from one ranking to the next. Testing information, former college record, and present OSU averages affirmed this relationship.

The age of the transfer student did not offer findings of effect in the relationship of ability and performance.

These other factors were studied by comparison of the means and did not reflect the extremes of the distribution or the cases of individual students. The indicators offering greatest effect were those factors of ability, past performance, and the level of the college program.

Summary of regular and special admissions

Findings on regular and special admissions compared the mean indications of the relationships of ability and achievement for these two classes of students. Regular admissions emphasized past performance at a satisfactory level of 2.00 as a minimum. Special action admissions were accorded those below 2.00 for former college GPA adjusted by the addition of testing information.

Nearly the same proportion of special action admissions continued into their third quarters of study as had started. The markings of difference in the two groups supported the findings that those who have done well in their studies tend to continue to do so. Those who have not done so well may deserve extra opportunity to try again but will
tend to have lower academic standing than testing information predicts for the entire group. The special action group with higher mean ACT Composite scores did better or as well as in performance than those admitted just above the minimum standard for required GPA.

**Conclusions**

Review and consideration of the findings has elicited the following conclusions for this study of transfer students:

1. The analysis of the variance of the prediction of achievement indicates that only about one-fourth is associated with the independent variables, regardless of their significance and relationship. Reasons for this conclusion are (a) that many contributors to academic performance are not found in results of the ACT, (b) that anything less than a perfect relationship of the independent variables with the criterion guarantees some variance difference, and (c) the vagaries of grading and marking practices between institutions, departments, and individual faculty members limit the reliability of GPA as the criterion.

2. Previous academic performance at the college-level is the important contributor to academic prediction, particularly in the long-run determination. Subsequent achievement is significantly related to the evidence of former college GPA.

3. The effectiveness of ACT in the prediction of academic performance is significant and important for the overall population, but it is most effective in the determination of potential success in specialized programs, such as Commerce and Engineering.
4. Prediction from statistics for the total group in its first quarter was as significant as that from the statistics for the sub-group reaching its third quarter; the long-range effect was not more powerful in predicting for the entering transfer student.

5. The prediction equations for Commerce and Engineering emphasize the contributions of testing information to the exclusion practically of the former college record. It appeared that the students who entered Commerce were not predictable on the basis of their past performance, whereas the small group admitted to Engineering had had generally low achievement records but had to have higher ability measured by the ACT to achieve well.

6. The students admitted to Arts and Education showed nearly equivalent dependence upon ability measures of a verbal nature and the former achievement record.

7. Other factors may provide significant information, but those of an intellectual nature are reflections of the past performance level and choice of educational opportunity.

8. The junior or community college programs provide needed opportunities for students at the college-level, but do so apparently at a somewhat lower level than common for four-year or higher colleges and universities. A relationship exists in the same trend between ability and performance but at the junior or community college less ability can earn higher GPA than is indicated at colleges of higher level.
9. Those accorded special action admissions demonstrated as a group the difficulties in changing the effects of the past record of performance; however, many change and, in choosing to do so, give credence to the policy for making exceptions.

10. The analysis of the data indicated that variations in the range extremities and among individual students suggest the importance of motivational, attitudinal, and other nonintellectual factors.

Recommendations

The following recommendations have been derived from the study of transfer students at OSU:

1. The relationships of the ACT Composite and Former College GPA were of sufficient strength to support the recommendation that these be used in the prediction equations for future achievement at OSU. An immediate recommendation to be implemented with proper clearance is to review the credentials of those with minimal satisfactory GPA and to supplement achievement information with testing results.

2. This study depended completely upon intellectual measures of achievement and did not introduce personality variables which might be found to be strategic to the achieving, creative, or intellectual personality. Factors of a nonintellectual nature, including personality characteristics, motivations, attitudes, self-assessment, and self-direction, should be utilized to supplement the analysis of the student's prospects for success.

3. The conclusions of this study reflect the descriptive statistics for this population at this time for OSU and should be
evaluated and compared with transfer student populations from other colleges and universities.

4. A longitudinal study extending the reporting of this population throughout its entire career at OSU would be beneficial so long as a university-wide program of institutional research is supported for purposes of comparative projection.

5. Follow-up of those students who leave OSU to transfer to other colleges and universities would provide results of interest on the degree of their eventual success.

6. Implications of these findings for the development of admissions policies by faculty and administration should be understood as these affect career decisions being made by college students.

7. The implications for further research denote reference to the institutional research program, elements in the professional qualifications of admissions staff personnel, articulation processes with junior, community, and other colleges, and the development of information services especially those used by individual persons.

a. The tables of predictive information could supply more effective bases for the acceptance and rejection of students who wish to apply for admission to the individual colleges or schools of the University. Periodic evaluation of the descriptive data for the entering transfer students would ensure continuous development of the predictive information employed by the University in its selection procedures and by students and admissions personnel in assessment of relative chances for successful transition to OSU.
b. Openness for transfer opportunities should be encouraged to facilitate the reasonable development of educational and career choice-making. The results of this study should be reported and distributed for appropriate utilization in the processes of articulation still to be developed in Ohio.

c. The application of the findings to predictive schema for implementation into the literature and interviews of the admissions process would foster better self-realization and anticipated levels of aspiration for performance.
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