A COMPARISON OF ACADEMIC PERFORMANCE AND PROGRESS TOWARD GRADUATION BETWEEN PRESUMPTIVE-DENY AND REGULARLY ADMITTED STUDENTS IN A LARGE PUBLIC UNIVERSITY

DISSERTATION

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By

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This study is concerned with the problem of measuring, describing, and analyzing the academic performance and progress toward graduation over a five-year period (1977-1983) of students who entered a large public university through an admissions review committee process for presumptive-deny students. The purpose of this study is to compare the academic performance of these students (N = 310) with that of randomly selected students who entered through the regular admissions process (N = 350) to determine if the review committee's decisions were as effective in selecting students for admission as were the objective data (college entrance examination scores and rank in high school class) used in the regular admissions process. Neither transfer nor non-United States citizens were included in either group.

The measures of academic performance used are grade-point average and occurrences of academic probation and suspension. Progress toward graduation is measured by cumulative semester hours earned, persistence, and graduation rates. Calculations were made for each year of the

study period to determine mean grade-point averages, mean cumulative semester hours completed, persistence rates, and graduation rates at the end of both the fourth and fifth years. The variables examined are SAT and ACT scores, high school rank in class, sex, age, marital status, race, and college major. Fisher's t test or a chi-square test were used to determine if there were statistically significant differences between the groups on these data.

The resulting data findings of this study are compared to data presented in related literature on similar student cohorts. It is concluded that although the subjective judgments of the Admissions Review Committee were not as effective in selecting students who perform as well as students selected by objective data, the committee decisions serve the function of meeting important social goals by admitting larger numbers of minority students.

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CHAPTER I

INTRODUCTION

In its efforts to meet social goals, public higher education has been asked to assume the sometimes overwhelming task of educating students who enter with disparate academic abilities and thus disparate needs. In order to fulfill these societal demands for access to higher education by all those who desire college experience, post-secondary education has organized itself in a pyramidal fashion. The community colleges, which may be entered by nearly anyone, form the base of this pyramid; the major research universities (most of which are private), cluster at the apex of the pyramid, accepting only those students who have extraordinary abilities. Between the base formed by the community colleges and the apex formed by the highly selective universities, reside the multitude of moderately selective colleges and universities. Students who have varying academic abilities may successfully apply for entrance into these institutions.

Zemsky and Oedel suggest that this system of higher education works largely because students interpret access to a college or university as being "contingent upon the student's ability to perform, and benefit from, college-level work" (9, p. 5). Unfortunately, not all students who apply to a college

have made realistic assessments of either their own academic abilities or the demands of college work. Failing in these assessments, students often apply to institutions that have standards for which they are poorly prepared. No educator knowingly wants to discourage students from reaching further and doing better, and herein lies the admission officer's dilemma. This dilemma is most acute in public universities where taxpayers and their children often expect to be admitted regardless of prior performance or academic ability.

In an honest attempt to represent the difficulty level of classroom work to students who apply, colleges and universities have established benchmarks--admission requirements. These requirements are the result of historical fact derived from studying previous classes; they are the university's way of informing prospective students that only those whose academic abilities are at or above the stated required level will have a fair chance of being successful in the classroom. These admission requirements are most often stated in terms of college entrance examination scores and high school performance levels.

Students often view published admission requirements as warnings rather than prohibitions against entry, and they will apply to colleges for which they are academically ineligible, fully intending to pursue the opportunity to try as their right. Recent studies of college admission practices show

that colleges and universities are attempting to accommodate such students with special admission procedures. These special procedures now exist in one form or another in virtually all large public colleges and universities for the expressed purpose of admitting presumptive-deny (see definitions) students (3, p. 28; 5, p. 291). Methods of applying exceptions vary along a continuum from permitting students to establish eligibility through a summer program of classes to the purely subjective judgments of admission officers.

In order to judge the validity of such admissions, universities should have a basis against which to gauge the expected academic performance of accepted presumptive-deny students. This study addresses this question as it relates to one large public university.

Statement of the Problem

The problem of the study is the academic performance and progress toward graduation of presumptive-deny students who were admitted to a large public university on the basis of the subjective judgments of a review committee.

Purpose of the Study

The purpose of this study is to compare the academic records of a group of presumptive-deny students who were admitted through an admission review committee process with

the records of a group of students who were admitted under standard requirements to determine if there are any significant differences between the groups and thus important differences in the effectiveness of the two admissions procedures.

Hypotheses

In order to carry out the purpose of this study, the following null hypotheses were formulated. The hypotheses are grouped for testing according to academic performance and progress toward graduation.

Hypotheses one and two are used to test for significant differences in academic performance between the study groups at various stages over a five year period.

Hypothesis One: There will be no significant difference between the cumulative mean grade point averages of the two groups (a) at tht end of the first semester, (b) at the end of the first year, (c) at the end of the second year, (d) at the end of the third year, (e) at the end of the fourth year, (f) at the end of the fifth year, and (g) at the time of graduation.

Hypothesis Two: There will be no significant differences between the proportion of each study group who were on academic probation or suspension over the five years.

Hypotheses three, four, and five are used to test for significant differences between the two groups as to the

amount of progress made toward graduation at various points in time over the five-year period.

Hypothesis Three: There will be no significant differences between the two study groups in the proportion who persisted (a) through the first semester, (b) through the first year, (c) through the second year, (d) through the third year, (e) through the fourth year, and (f) through the fifth year if they had not graduated by the end of the fourth year.

Hypothesis Four: There will be no significant differences between the mean cumulative semester hours earned by each study group (a) at the end of the first semester, (b) at the end of the first year, (c) at the end of the second year, (d) at the end of the third year, (e) at the end of the fourth year, (f) at the end of the fifth year, and (g) at the time of graduation.

Hypothesis Five: There will be no significant differences between the study groups in the proportion who had graduated after five years.

Definition of Terms

The following terms are defined as they relate to this study.

Presumptive-deny students are those students who fail to meet the published admission requirements of North Texas State University.

Persisters are defined as students who completed coursework during the time period specified in the study. For example, first-year persisters are students who completed coursework in any of the four semesters of their first academic year.

ARC students is an acronym designation for students who were admitted through the Admission Review Committee of the university.

REG students designates those students who were admitted through the regular admission process of the university.

Limitations

This study is limited to the five-year period from the Fall Semester, 1977, through the Second Summer Session, 1983. The reasons for this time limitation are (a) the Admission Review Committee was not in operation prior to the Fall Semester, 1977, and (b) the grades for the Second Summer Session, 1983, were the latest grades available at the time the data were gathered.

Basic Assumptions

It is assumed that students who enter under the regular admission policy of the university set the standard by which disparate groups can be judged. Additionally, it is assumed that students who entered the university during 1977 and 1978 are not significantly different from each other.

Background and Significance of the Study

Admission practices in American colleges and universities are central to the stormy issue of which students should go to college. Many public institutional policy decisions and legislative acts have focused on this issue, and the general consensus is that since a college education is important not only to improving the quality of life of individuals but also to enhancing the quality of a democratic society by providing better informed citizens, the opportunity to pursue a college education should not be withheld unjustly from any student (1, p. 219; 6, p. 203).

The National Research Council's committee on ability testing concisely states the reasons behind the renewed attacks on selective admission practices. They state that "because the allocation of educational opportunities has come to be recognized as an exercise of power, many are no longer willing to let the admission process go on entirely behind closed doors" (7, p. 191).

Public pressure for more liberal admission policies has encouraged many colleges and universities to establish procedures for handling appeals from students who are denied admission by the institutions' selective admission standards. As noted earlier, recent studies of college admission practices show that, in fact, special admission procedures now exist in one form or another in virtually all large

public institutions and probably also in most other types of institutions (3, p. 28; 5, p. 291).

Due to the fact that special admission procedures are now being used in nearly all American colleges and universities, it has become important to document the effectiveness of such procedures. Questions that should be answered revolve around whether or not students who are admitted through these special procedures perform as well as students admitted under more stringent admission standards. Furthermore, if students accrue important benefits through a college education, data should be gathered that will reflect whether or not the students who are admitted through special procedures succeed in obtaining that education in sufficient proportions to warrant the added expense of providing the special academic support services required for large numbers of them to succeed.

In 1977, North Texas State University, a large public university that has moderately selective admission requirements, opened a new route of access for students who lack objective proof of their academic abilities. Through an admission review committee process, subjective judgments by admission professionals and faculty members are used to select students for admission who did not meet the published requirements.

To date, there have been over 1,000 of the presumptive-deny students admitted by the committee. A study of this

large group of students provides a needed opportunity to add some critical and previously unrecorded data to what is known about the academic performance of presumptive-deny students who are selected for admission by subjective judgment.

Willingham and Breland, who recently concluded an important study of the use of personal qualities in admissions, note that previous admission studies focus heavily on traditional academic measures and that "this lack of balance needs to be redressed, particularly with follow-up studies of applicants within institutions" (8, p. 25). They also note that such issues as subjective judgments about the personal qualities of college applicants are of such scope and character that they "must be addressed by individual institutions over time, and any one study can only hope to add a useful piece to a larger picture" (8, p. 25). Since the admission review process at North Texas State University is a prime example of the use of subjective information in admission decisions, this study will provide one of those "useful pieces of the larger picture" identified by Willingham and Breland.

There has long been an interest in the academic performance of high-risk students in university settings, and this interest has accelerated with the social pressures for open-door policies. Cold, Bolding, and Johns (2) and McConkey (4) investigated how presumptive-deny students perform in college after obtaining passing grades in a summer provisional program

which was designed to test their abilities to perform in the college classroom. These summer provisional programs eliminate some students who might have succeeded had they been given more time with less pressure and studies of this type leave unanswered the question of how well these presumptive-deny students might have performed if they had studied under the normal time frames and pressures of most entering freshmen. Also, unanswered by previous research is the question of the degree of success of presumptive-deny students who are admitted by the subjective judgment of a review committee. These important questions are addressed by this study.

Organization of the Study

Chapter I has presented the problem and purpose of this study and has outlined its background and significance. Chapter II includes a review of the relevant literature, and Chapter III discusses the statistical procedures used to analyze the data. Chapter IV presents the data findings, and Chapter V includes a summary of the study, a discussion of the major data findings, the conclusions drawn, and recommendations for future research.

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CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Because the very existence of special admissions procedures seems to be a response to societal interests in the college admission process, a review of the literature relating to social issues in college admissions was conducted and is discussed in the first section of this chapter. Also in this first section is a review of the ways in which higher education has responded to these issues, and an examination of the current predominant admissions model, which is hypothesized to be a reflection of the social mood of the nation. In discussing the predominant admission model it also is pertinent to discuss the most often used selection variables and the degree to which they seem to work as predictors of college success.

A review is made of the literature on the use of interviews, recommendations, and biographical data in the selection of students, because these seem to be the most frequently used base for making subjective judgments in admission commitees of all types. The discussion of the literature on these topics is in the second section of this chapter. The third section deals with the resultant college performance

of presumptive-deny students, and, because there is a need for benchmarks to gauge the progress of presumptive-deny students in higher education, the final section is a review of the literature on the characteristics of entering college students and on the persistence and graduation rates of college students in general.

The Impact of and Response to Social Pressures on the Admissions Process in American Higher Education

In recent decades, higher education has been pressured to respond to the social issues that surround the open-door policy for admissions. This section examines both the impact of this policy and the response to it by higher education institutions.

The Impact of Social Issues on College Admissions

In her book Beyond the Open Door, Cross (21, p. 1) discusses how social consciousness has influenced who goes to American colleges and universities. She says that this viewpoint of American higher education has flowed from an aristocratic to meritocratic and finally to an egalitarian view on who should go to college.

The egalitarian view of who should go to college permiates the literature of the late 1960s and early 1970s. The views of the Carnegie Commission on Higher Education (14); the Carnegie Council on Policy Studies in Higher Education

(15); Ferrin (27); Scott (63); and Willingham (76) are just a few but they are highly representative of the egalitarian view predominantly held concerning higher education. They argue convincingly that meritocracy was not a sufficiently broad view to permit significant proportions of previously excluded groups full participation in the rewards of higher education. That is, minorities, women, and disadvantaged students should be admitted in larger proportions than the intricacies of a meritorious admissions model permitted. The root of the controversy over selective admissions in the nation's colleges and universities is expressed in a report by the National Research Council's Committee on Ability Testing; "because the allocation of educational opportunities has come to be recognized as a exercise of power, many are no longer willing to let the admission process go on behind closed doors" (48, p. 191).

The Carnegie Council on Policy Studies in Higher Education (15, p. 219) suggests in its final report that there is a consensus that a college education is important to improving the quality of life of individuals and to enhancing the quality of democratic society by providing better informed citizens and as such should not be withheld unjustly from any student. Adding an even stronger argument for more open access to higher education, the Carnegie Council report suggests that a college education even affects the parenting of future generations.

> College education affects cultural interest, political and community activities, consumption patterns, savings and investment patterns, the status and state of the individual's health, and, perhaps most important of all because its effects are passed on to the next generation, performance as parents (15, p. 219).

The Council warned that decisions made now about higher education

> reflect choices about what the future can and should be like. In the American context this has meant a perennial concern with whether arrangements for higher education would tend to favor or impede a future in which there would be as much or more equality than in the past (15, p. 240).

In a search for some agreement on the barriers that prevent society from realizing all the good it might accrue from allowing its citizens to have equal access to higher education, Ferrin (27) surveyed twenty years of literature on barriers to college attendance and formulated four categories into which most barriers fall. These categories are (a) academic (e.g., poor preparation in school and restrictive admission requirements); (b) financial (e.g., tuition and fees, room and board costs and limited financial subsidies); (c) geographic (e.g., distance in miles and minutes from home and limited transportation resources); and (d) motivation (e.g., lack of encouragement from teachers, family, counselors, and friends). Scott (63, pp. 52-53) feels, however, that Ferrin does not dicotomize these categories sufficiently to show whether they are barriers that public policy could change or barriers that are related solely to

student choices. Scott adds an additional dimension to the four categories by stating that in some cases the academic barriers result from poor student choices and not from restrictive admission policies per se. He lists these choices as (a) students make decisions about which high school courses they take, which has the effect of tracking them away from standard college preparation; (b) students can have the wrong perceptions about college and therefore be unprepared for the emotional trauma and mentally demanding work they are likely to meet until they are into the college going process, at which time they drop out; (c) not all financial barriers are the result of the lack of public support for financing higher education and students in education since students and families make choices about discretionary income that may preclude attending college; families may feel they cannot forego the income the student could contribute to the family unit if he went to work instead of college. Furthermore, according to Scott (63, pp. 52-53), geographic barriers could be not only the physical location of the college but also the student's feeling of psychological distance and the fear of leaving home. Motivational barriers could be the result of a low self-concept, lack of confidence, low personal aspirations, or no belief in the "pay-off" of further schooling. All of these are both reasons that are unrelated to public policy decisions and factors that are unlikely to be changed by societal demands.

It appears therefore that not all the barriers to equal access to higher education have been or ever can be removed by social action. The two issues however, which seem to be brought into sharpest focus in the literature are the academic and financial barriers. The Carnegie Council report (15) highlights these two issues in its discussion of the terms equal opportunity and equal access. It defines equal opportunity as having to do with offering everyone, regardless of ethnic origin or socioeconomic condition, acceptance to college if they can meet academic requirements and can pay. Equal access, on the other hand has to do with "lowering the walls of academic and economic abilities" (15, p. 241). Although this review does not extend to include the debates over economic abilities, there is a large body of research on student financial aid. This review is confined to the debate that surrounds lowering the requirements for academic abilities.

The literature that deals with academic barriers seems to be focused in the body of research and discussions surrounding the issue of selective admissions. Shaffer, who summarizes the issues well, notes that the two pressing questions are "(1) can colleges select the students who in the broadest sense are the most promising and (2) are the colleges in the public interest, entitled to do so?" (65, p. 41).

The Response of Higher Education to Social Pressures on College Admissions

Higher educations' response to the notion of egalitarian values has been to engage in heated debates over the merits of selective versus open admissions. Scott (63, p. 247) recognizes that the issue of open admissions is not yet settled, and that it is still a dynamic ideal of equal opportunity. He believes that one of the major problems in discussing open admissions is with the definition of terms: he notes that the term implies a dichotomy--open admissions and closed admissions--when in fact higher education has been moving along a continuium toward the opening of access. Scott says, "The term conveys no feeling of a continum on which to calibrate the degree of openness" (63, p. 250). For that reason he prefers the use of "opened," "opening," or "expanded" admissions (63, p. 251).

After studying the admission processes commonly used by colleges, Skager comments that "the picture that emerges, albeit impressionistic, reveals substantial flexibility in the dominant model. This is important since the nature of the model relates directly to the openness of the system" (66, p. 290). Skager terms this a three category model in which applicants are initially classified into (a) presumptive-admit, (b) hold, and (c) presumptive-deny categories. Presumptive-admit applicants are those who have strong academic credentials; hold applicants are those who are less

outstanding but who may, on further examination, be found to have special qualifications that move them into the admitted category; finally, applicants in the presumptive-deny category, are those who would be screened for "special admissions" (66, p. 290). Skager identifies the predominant method used to categorize students as being one that utilizes both some form of test scores and high school performance in an equation to predict some future success--generally first year grade-point average (66, p. 289).

A recent survey conducted by The College Board in cooperation with the American Association of Collegiate Registrars and Admissions Officers (AACRAO, 19) confirms Skagers impressions that the college admission process may offer more access than some believe. This survey included 1,500 postsecondary institutions both public and private, four-year and two-year. The survey reveals that in 1978, 83 per cent of all applications resulted in a favorable decision. The acceptance rates varied by the selectivity level of the institutions and ranged from a 96 per cent acceptance rate of applicants for the 498 open-door institutions, to a 56 per cent acceptance rate for the 124 competitive colleges reporting (19, p. 2). It appears that, on the average, applicants had an excellent chance of being admitted to college. The fact that only 8 per cent of the reporting colleges were competitive (admitted only limited numbers of

applicants who met specified requirements) encourages one to believe that admissions is more open than many previously thought (19, p. 35).

After studying the predominant admissions model, Skager (66, p. 289) reports that it is one in which the high school record is used either alone or in combination with an SAT or ACT score to predict success. Skager's findings were supported by the College Board-AACRAO study (19, p. 12); 94 per cent of the four-year colleges reported using the high school grade-point average or rank in class in their selection process, and 75 per cent reported using test scores.

Although the use of predictive measures in college admissions is widespread, as demonstrated in the College Board-AACRAO study, not everyone agrees on the merits of these measures in an egalitarian system. Fincher (28) and Goldman and Widawski (33) warn that although the intended use of standardized tests is to benefit both the student and the college by avoiding false-positive errors in selection (a selected individual fails), the very nature of prediction is such that false-negative errors are regularly made (rejection of would-be successes), and this is a tragedy of no small consequence to society (33, p. 185).

The use of measures of academic achievement to predict college success is addressed often in the literature. The general consensus is that a student's high school record is

the best single predictor of college success in the first year if grade-point average is the criterion, but the best prediction rate results from a combination of the high school record and standardized test scores (11, 29, 31, 37, 67, 70).

The attacks on tests--in the face of the large body of knowledge attributing to their worth in the selection process--is viewed by the Committee on Ability Testing of the Nation Research Council (48) as an attack on selective admissions. The report of the committee states,

> There is a vocal, deeply felt, and fairly widespread sentiment that the tests used for admission to higher education and the admission process to which they contribute are unfair. . . . Tests, the most tangible if not necessarily the most important element in post-secondary admissions decisions, have been the target of the greatest popular dissatisfaction. Given this climate, the central question concerns control of the test instruments and of the decision rules that govern the admissions process (48, pp. 191-192).

Just how selective are the nation's colleges? In the College Board-AACRAO (19) survey referred to previously, it is reported that the mean minimum high school grade-point average required for admission to the colleges in the study was 2.0, and the mean minimum high school percentile rank was at the fortieth percentile. The mean minimum SAT required was less than a 750 total score (verbal plus math), and the mean ACT-Composite score required was 16 (19, p. 12). Both of these means are below the national mean of all students who take the tests (1, p. 11; 18, p. 4). These data indicate that selectivity based on high school performance

and admission test scores excludes few students from college.

Although it is too early to tell the extent to which recent developments will affect the openness of college admissions, a new chapter is being written in the controversy over open admissions. In a recent report by the United States National Commission on Excellence in Education, A Nation at Risk: The Imperative for Educational Reform (74), the commission recommends that four-year colleges and universities raise their admissions requirements. Boyer, President of the Carnegie Foundation for the Advancement of Teaching, is quoted by Sully in the Chronicle of Higher Education as saying that the commission's report is "outdated in some respects. In discussing many of the areas of reform, the commission is simply affirming what has been in the works for several years" (69, p. 1). Boyer is right in his assessment of current events. As early as 1981, Ranbom (59, p. 1) wrote in Education Week that administrators in public colleges were reporting that they were raising admissions standards.

During the spring of 1982, the National Association of Secondary School Principals conducted a fifty-state survey of public university systems, and Thomson (71, p. 4) reports that twenty-seven state systems either have increased their admissions requirements or currently have admissions requirements under review. Thomson reports that thirteen states

have already announced new admissions requirements which are to be phased in over varying time periods from 1983 to 1987.

Because these developments are so recent, researchers are not yet able to evaluate the effect these changes may have on the openness of admissions in American higher education institutions. There is, however, no indication that these changes will affect the occurrence of special admissions.

According to the College Board-AACRAO survey, 88 per cent of all four-year colleges have some form of special admission procedure for presumptive-deny students (19, p. 28). This finding is verified by Skager who is prompted by his study of admission practices to conclude that "special admission procedures exist in one form or another in virtually all large public institutions, and probably in most other types of institutions as well" (66, p. 291).

When the respondents to the College Board-AACRAO survey were asked to identify the groups of students who were regularly given access to college through a special admissions process, the largest number reported that adults were more likely to gain access through special admissions than were any other identifiable group (19, p. 29). The median percentage of special admissions granted to minorities as a group is reported to equal 23 per cent of all exceptions that were made. Other groups reported as being granted

exceptions to published admission requirements (in descending order by number of colleges reporting) were exceptions made for the disadvantaged, the physically handicapped, students with special talents, relatives of faculty, and relatives of alumni (19, pp. 30-31).

The social issues that influence college admissions and colleges' responses to those issues were discussed in this section. The predominant admissions model is one that uses some combination of high school performance and standardizated test scores in the selection process. The evidence of the literature suggests that the admissions policies of American colleges and universities may permit more access to higher education than many believe. In the next section, the findings from the literature relating to the use of subjective data in the admissions process is discussed.

Subjective Judgment in the Selection Process

Since the major problem being addressed by this study is the academic performance of presumptive-deny students who were admitted to the university on the basis of the subjective judgments of a review committee, this section includes a review of the literature relating to subjective judgments. Subsections include various subjective criterion applied in presumptive-deny cases.

In the College Board-AACRAO national survey of colleges (19), colleges were asked to list the characteristics other

than measures of academic ability that are important in their selection of students. Evidence of motivation or initiative was listed by 90 per cent of the private four-year colleges and by 57 per cent of the public four-year colleges; citizenship and moral character was listed by 81 per cent of the private and 35 per cent of the public four-year colleges; evidence of special skills or abilities was listed by 78 per cent of the private and 55 per cent of the public four-year colleges. Other factors, which include work experience, community or church involvement, and leadership capabilities, were taken into consideration by substantial proportions of public institutions (19, p. 15). Because such characteristics as motivation, moral character, initiative, and citizenship are highly sensitive to subjective judgments, decisions about students based on these characteristics seem to be built on highly subjective judgments about their effect on students' abilities to perform in the college classroom.

When asked whether interviews with students are used in the selection process, 92 per cent of private colleges and 61 per cent of public colleges responded affirmatively; when asked if letters of recommendations are considered, 89 per cent of the private colleges and 55 per cent of the public colleges responded positively (19, p. 19). It is evident from this survey that a large proportion of colleges use student characteristics in at least some admission decisions

that require subjective judgments, and that these subjective judgments are formed in a large measure from reading letters of recommendation or through interviews with applicants. Since letters of recommendation and interviews are reported as being used by a large percentage of colleges in the admissions selection process, there is a need to know what the literature reveals about the reliability and validity of letters of recommendation and interviews.

Letters of Recommendation

The reliability of letters of recommendations used in the National Science Foundation's scholarship selection process was investigated by Harmon (34). He calculated that the reliability of a single letter of recommendation is in the low .30s, and multiple recommendations are not a great deal more reliable (34, p. 25). Although Harmon's study is nearly twenty years old, it is a landmark study in the use of recommendations to make academic decisions about applicants.

More recently, Cuca, Sakakeeny, and Johnson (22, p. 32), who reviewed twenty years of literature on medical school recommendations, report that recommendations by undergraduate professors failed to correlate to any degree with letters written by classmates about the same medical school applicants. Rim (60, p. 440) analyzed 89 letters written about 23 candidates for teaching positions in a university and observed

that there was no systematic relationship between the kind of letter written about the candidate and the candidate himself.

Fitzsimmons and Reed (30, p. 8) conducted a study of high school counselors' recommendations compared to admission officers' overall ratings of student application files at Harvard-Radcliffe. They report that the correlation was .48 between counselor's reports of the student and the admission officer's ratings of the same student (based on objective data in the application file), which suggests that the counselors' letters of recommendation were only somewhat reliable when measured against objective data. Breland (11, p. 29) reviewed several studies that report evidence of the validity of recommendations. After reviewing the evidence of validity of several types of recommendations in various settings, he calculated a median predictive correlation of .20 for academic outcomes.

Interviews

Breland (11, p. 40) also reviewed numerous studies that report predictive validities of interviews in predicting academic outcomes. Calculating a median correlation of .15 across all studies, Breland concludes that academic outcomes are not accurately predicted by interviews. Furthermore, he found this to be the case even though interviewers often had access to ancillary data on academic performance and test scores at the time the interviews were conducted.

In his analysis of interviews in the college admission process, Frederiksen (32, p. 104) discovered that interviewers' judgments "water down" better data available to them in the student folder, and that this may explain the lower correlations for interview judgments than what is attainable from data in the same folders used by the interviewer. Additionally, he identifies the main problem of interviewers as being what exactly to assess in the interviews. Willingham and Breland recently substantiated Fredriksen's findings; they state that "Evidently in attempting to improve on objective measures, expert raters often over compensate for aspects of an applicant's record that merit only slight consideration" (77, pp. 38-39).

Biographical Data

The application files of students generally include a great deal of biographical data. These data are either on the application itself or reported to the college by one of the major admission testing agencies. Both the American College Testing Program of the American College Testing Corporation (1) and the Admission Testing Program of the College Board (18) collect extensive biographical data through the registration and testing process and report these data to colleges along with the test scores. According to the College Board-AACRAO survey (19, p. 15), colleges use this type of information in some admissions decisions.

A landmark 1960 study by Anastasi, Meade, and Schneiders (2) found that numerous biographical characteristics correlated positively with college success. These characteristics are large family; high participation in school activities; honors and offices in school; anticipation of involvement in college activities; plans for graduate study; no anticipation of academic difficulties; language as the favorite high school subject; extensive use of reading materials; and hobbies. However, in a 1982 study of the use of personal qualities as a criterion for college admissions, Willingham and Breland (77, p. 160) found that adding personal achievement to an equation that uses high school rank and SAT stores adds relatively little to the admissions officer's ability to predict grade-point averages successfully.

In an excellent summary of the predictive correlations of various means of assessing student characteristics in an attempt to predict academic outcomes, Breland (11) calculated the median predictive correlations as shown in Table I. These correlations are derived from studies conducted in colleges, graduate schools, law schools, business schools, medical schools, plus settings in industry, business, military, and government. As the data in Table I show, recommendations, interviews, and interest measures have very low correlations with academic outcomes. Biographical data seem to have the most promise in predicting academic outcomes.

TABLE I

MEDIAN PREDICTIVE CORRELATIONS OF VARIOUS METHODS OF STUDENT ASSESSMENT*

Method of Assessment	Median Correlation with Academic Outcomes
Biographical data	.43
Recommendations	.20
Interviews	.15
Interest measures	.12
Personality measures	.28

*Breland (11, p. 46).

Willingham and Breland (77, p. 65), however, point out that although many of the personal qualities of students seem to have low validities as predictors of college success, such validities may not be important to institutions that are attempting to diversify the student body or to meet social goals for certain group participation.

In summary, in the quest for colleges to provide alternate routes for presumptive-deny students, they must rely on data other than test scores and high school records. Often, these data require subjective decisions as to their value in any attempt to predict academic outcomes. The processes that colleges often use--interviews and letters of recommendation--may be so unreliable as to make decisions derived from them no better than subjective judgments in predicting academic outcomes of students.

Because colleges have a greater need to use subjective judgments when admitting presumptive-deny students, it is important for college admissions officers to know what the literature reveals about the performance of presumptive-deny students once they are admitted. In other words, how effective are subjective judgments in predicting college success? The next section contains a review of the literature on the performance of presumptive-deny students.

College Performance of Presumptive-Deny Students

In the literature, presumptive-deny students are most often referred to as "high-risk," "low-ability," or "disadvantaged" students. Reporting on a review of the literature on such students is confounded by the fact that the criteria for placing students in one of these categories vary from study to study. The criteria seem to fall into the four categories of (a) being a minority student, particularly black (33, 38, 50, 65); (b) being from a low socioeconomic background (3, 35, 56, 57); (c) being of low academic ability (17, 40, 44, 46, 53, 78); or (d) having poor college preparation as a result of poor schooling (often defined as "educationally disadvantaged", 16, 67). Oliver (50, p. 1) points out that this diversity of definition is necessary because the high-risk student must be defined by each individual institution based on that institution's

criterion for student success. This review will be limited to those studies that define high-risk students as those who do not meet published admissions requirements.

The presumptive-deny student, by definition, enters college with lower standardized test scores and lower high school performance measures than those of regularly admitted students. The degree of how-much-lower varies from study to study. McConkey (44, p. 39) reports that certain provisional students, who entered the University of Texas at Austin through their summer and spring provisional programs, had a mean SAT-Total score of 793 compared to 1043 for regularly admitted students, and a high school percentile rank of 44 compared to 74 for regularly admitted students. In a study by Cole, Bolding, and Johns (17, p. 30) at the University of Arkansas at Fayetteville, the provisional students had a Cooperative English Expression Test mean score of 36.9 compared to 40.3 for regularly admitted students, and a mean high school grade-point average of 1.65 compared to 2.64 for the regularly admitted students. Although a study of special studies students conducted at Southern Illinois University at Carbondale is not a comparative study (mean scores and high school performance measures are not reported for regularly admitted students, Wilson (78, p. 33) reports that the mean ACT-C score for special studies students was 10.83, which is at the tenth percentile for all students who take this test (1, p. 11).

Given that high-risk students enter college with lower demonstrated abilities than do regularly admitted students, it could be expected that their college performance would reflect this difference when compared to regularly admitted students. Wilson (78, p. 33) reports that ACT-C scores and high school rank were found to be highly related to college grade-point averages for students in the special studies program. ACT-C accounted for 30 per cent of the observed variance in GPA.

In his study of provisional students at the University of Texas at Austin, McConkey (44, p. 57) reports that the first semester mean GPA for provisional students was 1.94 compared to 2.52 for regularly admitted students. After one year, the mean GPA of provisional students had dropped to 1.92 and that of regularly admitted students to 2.48; the difference in grade-point average at the end of the first semester and first year were found to be significant at the .01 level.

Cole, Bolding, and Johns (17, p. 5) report that after one semester the provisional students at the University of Arkansas at Fayetteville had a mean GPA of 1.33 while the regularly admitted students' mean GPA was 2.03. Additionally, they report that after one semester only 19 per cent of the provisional students as compared to 76 per cent of the regularly admitted students had made satisfactory progress (defined as above a C average) and that 20 per cent of the provisional

students and only 9 per cent of the regularly admitted students had been placed on academic probation. Furthermore, in a comparative study of provisional and regularly admitted students who entered Oklahoma State University between 1968 and 1983, Lacy (40, p. 23) reports that 75 per cent of the provisional students failed to meet the GPA requirements for enrolling in the second semester.

From the results of several studies, it was discovered that although academic ability is important to academic success in college for high-risk students, not all the GPA variance is explained by test scores or measures of high school performance. Other student characteristics have been found to contribute significantly to an institution's ability to predict student performance. Shaffer (65, p. 44) administered the Brown-Holtzman Survey of Study Habits and Attitudes Test to eighty-nine students in an extended opportunity program; using the results to predict college GPA, she found that orientation toward and motivation for academic pursuits, acceptance of one's educational goals, positive attitudes and positive techniques for studying are good predictors of college success. Shaffer further discovered that the EOP students who earned at least a 2.0 average by the end of the first year had a higher and more positive self-concept upon entering (as measured by Bill's Index of Adjustment and Values Test) and greater post-congruency between their vocational

personality and major fields of study (as measured by Holland's Vocational Preference Inventory). The findings of Clarke and Ammons (16, p. 15) verify some of Shaffer's findings; they discovered that, for disadvantaged students, positive attitudes toward self and one's environment are significant factors in predicting college success. Thresher (70, pp. 36-37) studied the characteristics of specially admitted students in several settings and discovered that those who perform well in college are generally late-to-mature, and action-prone individuals who have explosive energy and who find passive learning irksome.

The grade-point average of high-risk students is not the only factor that has interested researchers. Cole, Bolding, and Johns (17) and McConkey (44) looked at student progress toward graduation as measured by the number of semester hours completed and the rates of student persistence. McConkey (44, p. 57) found that provisional students at the University of Texas at Austin had accumulated 30.2 mean semester hours of credit by the end of three semesters, while regularly admitted students had accumulated a mean of 35.9. The first-year persistence rate for provisional students was found to be 47 per cent while that of regularly admitted students was 68 per cent, and after two years 32 per cent of the provisional students and 45 per cent of the regularly admitted students were still enrolled (44, p. 102). Cole, Bolding, and Johns (17, pp. 5-6) found that the provisional students entering

the University of Arkansas at Fayetteville between 1967 and 1970 had earned 33.3 mean cumulative semester hours by the Spring of 1971, while the regularly admitted students had earned a mean of 54.9 over the same time period. Additionally, they discovered that only 39 per cent of the provisionally admitted students who entered between 1967 and 1970 were still in school in the Spring of 1971.

While the attrition rates for students in general is a concern for all colleges, the problem is even more acute with high-risk students. Researchers have looked for quantifiable evidence of the causes of high attrition among high-risk students. As might be expected, the results of such attempts reveal that academic ability is the single most important predictor of attrition among high-risk students (36, p. 43; 43, p. 1; 78, p. 10). In MacMillan's (43, p. 1) study of the NORCAL project (a ten-year cooperative effort by twenty-two California Community Colleges to find causes of and to reduce attrition), he found that sex was a highly significant predictor of attrition in low ability students; low ability males were three times more likely to drop out of college than were low ability females. In addition, the dropout-prone student is profiled by MacMillan as being from a minority group (most likely black) and a low-income family; he lacks parental support for college attendance, is less likely to report college as being "very important to me personally," and has

low academic ability. Furthermore, although Wilson (78, p. 13) assumes in her study of special studies students that achievement motivation is important to persistence for high-risk students, when Ashbough, Levin, and Zaccaria (3, p. 65) tested the same hypothesis with disadvantaged students at the University of Chicago-Chicago Circle, they found that achievement motivation was not related to persistence.

Can high-risk students be helped to succeed in college? Can attrition among this group be reduced? Lacy (40, pp. 22-23) reports that Operation COPE boosted the GPA of high-risk students who were not involved in the operation. Operation COPE, a pilot program established at Oklahoma State University consisted of tutoring, counseling, advisement, and group intervention with faculty and students. MacMillan (43, p. 4), whose findings support those of Lacy, reports that when student support services were emphasized in the NORCAL project, these services had a dramatic effect on reducing student attrition.

In a research project conducted by Whyte (75, pp. 199-200) at Elkino College in West Virginia, sixty-three high-risk students were divided into three groups for treatment and study. Group 1 received group counseling and study skills help; Group 2 received the same treatment plus faculty and counselor consultations; Group 3 received group counseling, study skills help, and individual internal-external

locus-of-control counseling. The data show that Group 3 earned a higher GPA than did Group 2, and Group 2 earned a higher GPA than did Group 1. Whyte therefore concludes that high-risk students can be helped to improve their GPA with faculty and counselor help and by being encouraged to take responsibility for their own actions.

There is some evidence to indicate that merely offering support services to high-risk students without forcing them into a support program is an ineffective means of helping high-risk students improve their college performance. McConkey (44, p. 97) compared the GPAs of provisional students who were offered (but not compelled to take advantage of) support services with those of provisional students who entered the University of Texas at Austin at a time when support services were not available. He found that there was no significant difference in first semester mean GPA between the two groups. Both groups of provisional students earned mean GPAs below a C average, and the mere availability of the support services had no effect on raising the GPA of provisional students.

Oliver (50, pp. 4-5) discusses another study in which underachievers at Carnegie-Mellon University were offered special counseling help to improve their college performance. Of the 35 students offered help, only 11 students sought it. The results were dramatic in terms of attrition rates; 50 per

cent of those who refused the help dropped out of college, while only 27 per cent of those who received help dropped out. Additionally, those who came for help improved their GPA by one-third of a point over their predicted performance.

In summary, high-risk students enter college with lower academic abilities than regularly admitted students and consequently do not perform as well in the classroom nor persist in as high numbers as do regularly admitted students. There is evidence, however, to indicate that high-risk students can be helped to improve their performance when the college is willing to provide support services and make those services compulsory. Since it is important to have data with which to compare the characteristics of entering students and benchmarks against which to gauge their performance, the next two sections include a review of the literature on the characteristics of entering college students and on persistence to graduation.

Characteristics of Entering College Students

This study is concerned with students who entered college in the fall semesters of 1977 and 1978. This section deals with the sex, age, race, and marital status of entering college students based on national data for the class of 1978.

According to a report by the National Center for Education Statistics (47, p. 2), males comprised 52 per cent of the 1978 first-time entering freshmen in university level

institutions. Astin (4, p. 14) reports that 79 per cent of the first-time entering class of 1978 were 18 years of age or younger, 19 per cent were between the ages of 19 and 22, 1.5 per cent were 23 years of age or older, and the approximate mean age was 18.4. Astin (4, p. 16) further reports that 89 per cent of the 1978 entering class were Caucasian, 8 per cent were black, 1 per cent were Mexican-American, and 2 per cent were classified as being of other ethnic backgrounds; 98.8 per cent were single (4, p. 3).

Persistence to Graduation

Stanley (67, p. 66) suggests that, in an important sense, the percentage of a college's entering class that graduates four to five years later may be an excellent measure of the college's selective and nurturing efficiency. The implication of Stanley's remarks are that the persistence rates of a college are in fact measures of how well that college has been able to match student abilities, characteristics, and needs with its own academic strengths, offerings, and available student services. Graduation rates are not only an important gauge of the college's performance, but, as Young (79, p. 279) points out, graduation (along with grades) remains the primary mark of student accomplishment.

The literature on persistence to graduation indicates that the report card for colleges is not very good. Pantages and Creedon (51, p. 49) reviewed studies of college attrition

conducted from 1950 through 1975 and found that for every ten students who enter college, four will graduate four years later, one more will eventually graduate from that college, and two others will graduate from another college. Lenning, Beal, and Sauer (41, p. 4) reported in 1980 that the four-year graduation rate from four-year colleges was from 35 to 40 per cent, the five-year rate was between 50 and 65 per cent, and extended time adds another 20 to 30 per cent. Eckland and Henderson (24, p. 3), using data from the National Longitudinal Study of the Class of 1972, found that 36 per cent of the entering freshmen from that cohort graduated from college in four years and 27 per cent were still pursuing a degree. The findings for this 1972 national cohort group are virtually identical to Eckland's (25, pp. 418-419) earlier findings from a ten-year follow-up study of entering freshmen at the University of Illinois. From this 1964 study he reports that 37 per cent of University of Illinois' freshmen graduated after four years, and 55 per cent graduated in more than eight semesters; he estimated that 70 to 74 per cent graduated somewhere eventually. The data on persistence to graduation have been remarkably stable over three decades. Effert's (39) 1957 study found that 40 per cent of entering freshmen graduated four years later, an additional 10 per cent graduated from that college sometime later, and 20 per cent of the lost students graduated from another college eventually.

El-Khawas and Bisconti (26, p. 60) studied a national sample of the class of 1961 and reported that 53 per cent graduated in four years. Bayer, Royer, and Webb (8, p. 4) studied a national sample of the freshman class of 1967 and reported that 57 per cent graduated from some college in four years. Astin (5, p. 11) studied a national sample of the entering class of 1968 and found that 53 per cent graduated from some college in four years.

Ramist (58, p. 2) conducted an exhaustive survey of the literature on graduation rates and reported that 35 to 40 per cent of entering freshmen graduate from their entering college in four years, an additional 10 to 15 per cent graduate from some college in five years, and an additional 10 to 15 per cent graduate from some college in six years. Of the entering freshmen, Ramist concludes that from 65 to 90 per cent will graduate from college somewhere eventually though not necessarily from their entering college. Ramist's findings of a 45 to 60 per cent total graduation rate within four years from some college (not necessarily from the entering college) substantiates the findings regarding the classes of 1961 (26), 1967 (8), and 1968 (5) previously discussed.

It also appears from the literature that persistence to graduation is improved once the student passes the sophomore year. Ramist (58, p. 3) found that almost 75 per cent of the students who complete the sophomore year without

interruption go on to complete all four years without interruption. Further, he found that of the 60 to 65 per cent who do not graduate from their college of entry within four years, dropout occurs in approximately equal percentages (15 per cent) in each of four periods: during the freshman year, between the freshman and sophomore years, during the sophomore year, and after the sophomore year.

From the National Longitudinal Study of the Class of 1972, it was found that 34 per cent of four-year college students withdrew within two years of matriculation (24, p. 24; 54, p. 366), and 46 per cent of the entering class had dropped out by the end of four years (24, p. 24). This substantiates Ramist's findings that most withdrawal takes place during the first two years of college, and it confirms Eckland's (25) earlier findings for students at the University of Illinois.

National averages for persistence and graduation rates can mask, however, the diversities of these rates when they are examined by types of colleges, types of students, and sex, age, and race of the students. Differences in withdrawal rates from college are important to note when studying graduation rates because these differences eventually translate into differences in graduation rates. For example, Iffert (39, p. 2) found that the cumulative effect of dropouts resulted in 50 per cent of an entering class lost to that college by the end of four years. The following sections

discuss the literature on persistence to graduation by various categories of colleges and students.

Type of College

There is evidence to indicate that there are differences in withdrawal rates based on the type of college a student attends. For example, from a study at the University of North Carolina at Chapel Hill, a comprehensive public university, Sanford (62, p. 268) reports four-year graduation rates of 51 per cent and five-year rates of 67 per cent; these rates are considerably higher than those reported as national averages. On the other hand, Young (79, p. 279) reports that only 15 per cent of the 1963 entering freshman class at the University of New Mexico graduated four years later, only 31 per cent graduated after five years, and, after seventeen years, only 42 per cent of the 1963 entering class had graduated. Dallam and Dawes (23, p. 158) followed the 1974 entering class at Kansas State University and report that 33 per cent had graduated after nine long semesters.

When Peng, Ashburn, and Dunteman (55, pp. 26-27) studied the class of 1972, they observed a withdrawal rate over the first two years of 40 per cent from two-year colleges and 29 per cent from four-year colleges. They also report a difference in withdrawal rates by college control; over the first two years, public four-year colleges had a withdrawal rate of

two years, public four-year colleges had a withdrawal rate of 28.5 per cent while private four-year colleges had a withdrawal rate of 22.3 per cent. In a study of nine selective private four-year colleges, Willingham and Breland (77, p. 84) found that the drop-out rate between the freshman and sophomore years averaged 10 per cent and ranged among the schools from 3 to 18 per cent.

Transfer Students

There is some evidence to indicate that transfer students persist to graduation at a higher rate than do native freshmen. Avakian, MacKinney, and Allen (7, p. 163) conducted a longitudinal study of students who entered the University of Missouri at St. Louis in 1975. They report that only 20 per cent of the native first-time freshmen remained enrolled through the fourth year, and only 13 per cent graduated at the end of the fourth year; for transfer students, however, the retention and graduation rates were 40 and 27 per cent, respectively. These findings are confirmed in a study by Brown (13, p. 103) at North Texas State University in which he found that only 11 per cent of the native freshmen who entered in 1971 had graduated four years later, while 26 per cent of the transfer students who entered in 1973 had graduated.

Sex

The findings are mixed regarding persistence to graduation by the sex of students. In a followup study of the 1961 and 1966 national sample of college freshmen, El-Khawas and Bisconti (26) found that females show a 10 percentage points higher four-year graduation rate than males. They noted that ten years after entry, however, males had a higher graduation rate by 5 percentage points.

A national study by Astin (5) in 1972 found that a higher proportion of men finish degree programs than do women. In the study at North Texas State University cited previously, Brown (13, p. 103) reports that 16.5 per cent of the native males but only 0.24 per cent of females had graduated in four years. Brown's findings parallel those of Avakian, MacKinney, and Allen (7, p. 163) at the University of Missouri at St. Louis.

In three separate studies of the class of 1972, it was found that there was no significant relationship between sex and persistence (24, p. 24; 54, p. 366; 55, p. 33). Additionally, Sanford (62, p. 276) reports that when sex was used to predict graduation at the University of North Carolina at Chapel Hill, the results were no better than those obtained by chance.

The fact that some studies found lower persistence rates for females may be partially explained by the findings of

several researchers (8, 20, 72) who report that women in four-year colleges are more likely than men to transfer to another college. The propensity of females to transfer could artificially deflate persistence and graduation rates in those studies in which transfers are treated as dropouts.

Race

In two separate studies of the class of 1972, it was found that, when abilities were controlled for, there were no significant ethnic differences in persistence rates for the first two years of college (54, p. 266; 55, p. 30). However, in a later study of the same cohort that covers four years of college experience, Eckland and Henderson (24, p. 24) found that race was significantly related to dropping out; they report that after four years 45 per cent of the white students had dropped out while 55 per cent of the black and 65 per cent of the Hispanic students had dropped out. When Eckland and Henderson controlled for ability, however, white students were more likely than minority students to drop out.

In a longitudinal study at the University of Mississippi, Rugg (61, p. 234) found that by the end of the second year 37 per cent of the non-minority students and only 27 per cent of the minorities had dropped out. The minority sample was 90 per cent black and was, in effect, a report of the difference between black and white dropout rates. However, Avakian, MacKinney and Allen (7, p. 164) report that the dropout rate

for blacks at the University of Missouri at St. Souis was higher than the rate for whites.

Two studies report graduation rates by race. In Brown's (13, p. 103) 1976 study of native and transfer students at North Texas State University, 13 per cent of the white native and 27 per cent of the white transfer students had graduated after four years. Although no minorities in either group graduated, there were significant numbers who had matriculated. When Sanford (62, p. 78) used race in an equation to predict graduation at the University of North Carolina at Chapel Hill, he discovered that not enough of the variance was explained by race and therefore concluded that race made no difference in the prediction of graduation.

The findings, then, on rates of persistence by race are mixed. Generally, however, if ability is controlled for, the data show that there are no ethnic differences in persistence through the first two years of college; when ability is controlled for, it appears that whites are more likely than minorities to drop out by the fourth year of college. The findings on graduation rates are also mixed. It is not clear from the literature if there is a real ethnic difference in graduation rates if ability is controlled for; in at least one study there was a big difference in graduation rates in favor of white students, but in that study ability level was not controlled for.

Age

Early in the research on the role of age in attrition prediction, it was discovered that there was no linear relationship between age and college success; the findings indicated that success was more dependent on the continuity of the educational process than on age (42, p. 347; 45, pp. 499-500; 52, pp. 484-485). In other words, the more recent high school graduate was more likely to be successful than the graduate who delayed college entry. Sexton reviewed twenty-five years of research on factors contributing to attrition and concludes that "generally speaking, students who enroll at the normal age plus or minus a year, had a better chance of persisting than students who were two or more years off the median age of entering students" (64, p. 315).

Brown (13, p. 103) confirms Sexton's findings by reporting that of the 153 first-time freshmen in his sample who graduated from North Texas State University in 1975, 152 were 18 years of age or younger upon entry. This finding reinforces the notion that continuity of the educational process is a strong indicator of college success since most 18-year-olds who enter college have just graduated from high school.

While there is an abundance of data in the literature that pertains to mean ages of college students, these data cover either all undergraduates or a total college population. As such, these data are not relevant to this study which follows two entering classes through to graduation.

Causes of Attrition

The causes of college attrition do not appear to be clearly substantiated in the literature. Peng, Ashburn, and Dunteman (55, pp. 51-67) found several important differences between those who persisted or dropped out during the first two years of college for the class of 1972. The higher the socioeconomic standing, the less likely students were to drop out; students whose father had a graduate degree were less likely to withdraw than students whose father did not have a graduate degree; students who worked full-time had higher withdrawal rates than students who worked part-time or not at all; students in academic fields had lower withdrawal rates than students in non-academic fields; full-time students had lower withdrawal rates than part-time students; students who had higher academic aptitudes had lower withdrawal rates than students who had lower academic aptitudes. It should be pointed out, however, that these findings do not describe <u>why</u> students withdrew from college; they are simply some differences in the characteristics of students who withdrew and students who stayed. The works by Bean (9) and Pantages and Creedon (51) indicate that the reasons students give for leaving college do not represent any clear and consistent rationale to explain the phenomenon. This inconsistency of the research findings led Noel to Lament that "Retention research over the past 50 years has not been productive. . . .

we continue to conclude that further research is needed" (49, p. 34).

From a review of the literature on attempts to predict persistence and attrition, the strongest single variable seems to be academic in nature (51, p. 68; 73, p. 101). Peng and Fetters (54, p. 366) found that high school rank, educational aspiration, and college grades were related to withdrawals in the class of 1972. In a review of studies covering twenty-five years, Pantages and Creedon (51) found that scholastic aptitude was positively related to persistence, and Astin (6, p. 300) reports that although scholastic aptitude is related to persistence, it is only half as stable as high school rank in predicting persistence. Willingham and Breland (77, p. 138) found that college grades had little effect on freshman withdrawals from the nine private colleges in their study. Berger and Bilef (10, p. 159) found that persistence and graduation rates were highly correlated with high school GPA for students admitted during the open-door years at the City University of New York.

In summary, graduation rates are important because they are measures of a college's selective and nurturing efficiency, and they are the primary mark of student accomplishment in college. This section reviewed the literature on persistence and graduation and found that most college students who drop out do so within the first two years, and only four of every

ten students who enter a college will graduate from that college four years later.

There is some evidence to indicate that transfer students persist at a higher rate than do native students. The evidence on graduation rates for both sex and ethnic groups is somewhat mixed; a clear picture did not emerge. Although age is not viewed as a significant predictor of persistence, educational continuity is. The data in the literature appear to show that the best indicators of persistence among college students of all types are academic in nature.

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CHAPTER III

STATISTICAL PROCEDURES

Introduction

For a better understanding of the groups used in this study, it is useful to describe fully the admission process at North Texas State University. From an interview with the Director of Admissions the following information was received.

Prior to 1977 there was no formalized committee structure through which students could appeal a denial of admission. Students submitted their applications along with their high school transcripts showing graduation date and rank in class. Students were also required to submit their scores on one of the two prominent national admissions examinations; students could submit scores from the Scholastic Aptitude Test (SAT) of the College Board or from the American College Test (ACT) of the American College Testing Corporation. Only the total scores of the verbal and math sections of the SAT were used, and only the composite scores of the ACT were used.

Students could establish eligibility for admission in several ways. If applicants were high school graduates in the first quartile of their graduating class, their scores on the ACT or SAT did not have to meet a minimum requirement. If their SAT scores were at least 800 or their ACT score at

least 20, they did not have to meet a minimum class rank requirement. Table II outlines these requirements.

TABLE II

NTSU ADMISSION REQUIREMENTS

Senior Class Rank by Quartile	Minimum Scores	
	SAT	ACT
First	None	None
Second	700	18
Third	750	19
Last	800	20
No minimum	800	20

High school graduation was a requirement for all students regardless of test score. Students who did not graduate from high school could submit a General Education Development (GED) certificate. Although submission of a GED certificate did not satisfy the requirement of high school graduation; and students who submitted a certificate were still classified ineligible (presumptive-deny), such students could be admitted by special approval.

Prior to 1977 all students who were classified as presumptive-deny were required to interview with an assistant or associate director of admissions (or at times with the director of admissions) if they wished to pursue their

application further. The admissions officer could do one of several things; admission could be denied, the Summer Provisional Program could be recommended, the student could be admitted by individual approval (in which case the student was not on probation), or the student could be admitted as a special student for one semester to take a single course. As might be expected with this procedure, students who did not agree with the decision of an assistant director of admissions would ask to appeal to the director, and then to the dean, and at times the appeal went all the way to the president.

In order to formalize the decision-making process and to involve all admissions officers in its procedures, an Admission Review Committee was formed in 1977. This committee was composed of all admissions officers including the director and dean and one faculty member appointed annually by the faculty senate. The class that enrolled for the Fall Semester, 1977, was the first class to enter under this new procedure.

Under this procedure the students who were originally classified as presumptive-deny and who wished to pursue their application made an appointment with an admissions officer who wrote an interview report but did not give the student a decision. Instead, the admissions officer informed the student that when the Admission Review Committee next met, the student's case would be considered.

During the committee meeting, the students' files were considered one at a time, and the interviewing officer gave a report of the interview along with his or her recommendations. Each committee member then voted his or her subjective judgment; a simple majority was required for admission.

Decisions to admit could be accompanied by recommendations that the student take study-skills courses in the counseling center. No follow-up was done, however, to insure that the student actually took the courses. Since no such records were kept, it was not possible to identify for this study those students who did take study-skills courses.

The Population of the Study

Descriptions of the study group and the comparison group follow.

ARC Study Group

The ARC study group is comprised of students who were admitted to North Texas State University through an admission review committee process. These students were originally classified as presumptive-deny students because they did not meet the published admission requirements. To ensure that enough students remained in the study for useful analysis through the fifth year, the entering classes of Fall, 1977, and Fall, 1978, were combined for a total of 636 students admitted through the admission review committee. Only those

students who had no transfer hours and who are United States citizens are used in this study. The study group therefore contains 310 students. To facilitate the discussion of this group, hereafter they are referred to as ARC students.

REG Study Group

The REG study group who were selected as a comparison group, consists of a random sample of freshmen who were admitted through the regular admission process. To avoid any bias which may have occurred if only one entering class were selected, the random sample was drawn from the entering classes of Fall, 1977, and Fall, 1978, which corresponds to the classes from which the study group was taken.

There was a total of 7,148 regularly admitted students in the Fall Semesters of 1977 and 1978. After those who were not United States citizens and those who had transfer hours were eliminated, there remained a total of 2,972 students. From this total a random sample of 350 students was selected using a computer's random number generation.

The sample size was determined by using a formula and accompanying table produced by the National Education Association and discussed by Krejcie and Morgan (3). The formula is as follows:

$$S = X\ NP(1-P-d)^2(N-1)X\ P(1-P), \text{ where}$$

S = required sample size,

X = the table value of chi-square for 1 degree of freedom at the desired confidence level (95 per cent in this case),

N = the population size,

P = the population proportion (assumed to be .50 since this would provide the maximum sample size), and

d = the degree of accuracy expressed as a proportion (.05).

Because a look-up table was furnished (3), it was not necessary to calculate this value (see Appendix). To facilitate the discussion of this group, hereafter they are referred to as REG students.

Table III data show that in the years 1977 and 1978, there was a total of 7,784 first-time freshmen who entered in the fall semesters. The number of regularly admitted (REG) students (7,148) represents 91.8 per cent of all students entering in 1977 and 1978. The 636 students admitted through the Admission Review Committee (ARC) process represent 8.2 per cent of the total.

When the data are examined by year, there are slightly higher percentages for the enrolled students who were admitted through the ARC process in 1978 than in 1977. The percentages are 7.4 and 8.9, respectively.

The REG sample represents 11.8 per cent of the regularly admitted students who were United States citizens and who had no transfer work. In the REG sample 47 per cent (163 students) entered in 1977, and 53 per cent (187 students) entered in 1978.

In the ARC sample by comparison, 52 per cent (162 students) entered in 1977, and 48 per cent (148 students)

TABLE III

NUMBER AND PERCENTAGE OF STUDENTS IN ORIGINAL POPULATION GROUPS AND THOSE IN THE STUDY BY YEAR OF ENTRY

Year	Total Freshmen (1)		Regular Admissions						Admissions by Review Committee					
			Total (2)		U.S.Citizens Non-Transfer (3)		Study Sample (4)		Total (5)		U.S.Citizens Non-Transfer (6)		Study Sample (7)	
	N	%	N	% of (1)	N	% of (2)	N	% of (3)	N	% of (1)	N	% of (5)	N	% of (6)
1977	3,855	100.00	3,569	92.58	1,519	42.56	163	10.73	286	7.42	162	56.64	162	100.00
1978	3,929	100.00	3,579	91.09	1,453	40.00	187	12.87	350	8.91	148	42.29	148	100.00
Total	7,784	100.00	7,148	91.83	2,972	41.58	350*	11.78	636	8.17	310	48.74	310**	100.00

*The total number of REG students used in this study.

**The total number of ARC students used in this study.

entered in 1978. The ARC study group contains only students who are United States citizens and who had no transfer work.

Procedure for Collecting Data

Permission was obtained from the North Texas State University admissions office to use the proceedings of the Admission Review Committee to obtain the names of students who were admitted by the committee for the Fall semesters of 1977 and 1978. Permission was obtained from the staff of the North Texas State University computing center to search their history files to identify, collect, and review the files of all first-time freshmen who enrolled in the Fall of 1977 and 1978.

The list from the admissions office was keypunched and matched against the computer files to determine who enrolled. Through the capabilities of the computer, all non-United States citizens and students with transfer hours were eliminated. The remaining students became the study group. After the files of the study group had been isolated, a sample was drawn from the remaining freshmen to obtain the comparison group.

The student records included, besides names and social security numbers used for tracking, all the data necessary to calculate mean grade-point averages, mean number of semester hours credit, proportion of students on scholastic probation and suspension, and proportion of students

graduated by the end of the fourth and fifth years of the study. Additionally, demographic data were maintained to permit descriptions and comparisons of the groups by sex, marital status, age, and ethnic category. The SAT or ACT scores and high-school rank information were also maintained on each student.

In order to separate the persisting from the non-persisting students, it was also necessary to maintain both the semesters in which each student completed course work over the five-year span of the study and the graduation dates of each student. Recognizing that differences could occur across colleges or schools within the university, also recorded and maintained were the college or school in which each student was originally enrolled and the college or school from which each graduated.

Analysis of the Data

As previously stated, the groups were given shortened labels; ARC represents the admissions review committee group, and REG represents the regularly admitted group. The high school rank information is reported on the students' records as rank in class and size of class. This was converted to a percentile rank in order to facilitate the comparison of students and to make possible an analysis of the data. The data were analyzed at the North Texas State University Computing Center using the Statistical Analysis System (SAS).

The purpose of this study is to compare the college performance of students admitted through subjective judgments (in this case the judgment of an admission review committee--the ARC group) with that of students admitted by means of objective data (in this case college entrance examination scores and high school rank in class--the REG group).

The following comparisons are of major concern.

1. A comparison of the college performance of ARC students with that of REG students is accomplished by using the t distribution technique to test for significant differences between the mean cumulative grade-point averages of the two groups at the end of their first semester, first, second, third, fourth, and fifth years, and at the time of graduation. Additionally, the chi-square technique for independent samples is used to test for significant differences in the proportions of those who were on scholastic probation or suspension over the five-year period. This specific use of chi-square is presented by Ferguson (1, pp. 186-187) as an alternative to obtaining a normal deviate and referring to tables of areas under the normal curve to determine significant differences.

2. A comparison of progress toward graduation of the ARC and REG students is accomplished by using the t distribution technique to determine if there are significant differences between the two groups in the mean number of cumulative semester hour credits earned at the end of their first

semester, first, second, third, fourth, and fifth years, and at the time of graduation.

3. Since persistence is also a measure of progress toward graduation, comparisons are shown for the proportion of the ARC group and the proportion of the REG group who persisted at each study stage. The chi-square technique is used to test for significant differences. In order to gain some insight into the effect that the attrition of less-able students might have on the differences in mean grade-point averages and cumulative semester hours from year-to-year between the two groups, an analysis is shown on dropouts. Using the t distribution technique, the mean high school rank and entrance examination scores of dropouts are compared with persisters across the groups to determine if there are any significant differences between the academic abilities of ARC dropouts and persisters and the REG dropouts and persisters. This is a post-hoc procedure.

4. A comparison of graduation rates between ARC and REG students is accomplished using the chi-square technique to test for significant differences between the proportion of ARC and REG students who graduated by the end of both the fourth and fifth years.

There is a potential problem with the use of multiple t tests across each of the years of the study in that the probability of making Type I errors multiplies significantly

in a series of t tests. The probability of making Type I errors with six t tests in a series is demonstrated by the following formula that uses the .01 level of significance for independent samples (3).

$$\text{Error} = 1-(1-d)^{k}, \text{ where}$$

$$d = \text{proposed confidence level,}$$

$$k = \text{the number of computations,}$$

$$= 1-(1-.01)^{6},$$

$$= 1-(.99)^{6},$$

$$= 1-.932,$$

$$= .067.$$

By using the .01 level of significance, the probability of making Type I errors is still within acceptable limits (about 7 in 100).

From a table of critical values of t, it can be demonstrated that the larger the sample size the smaller the t statistic needed for significance at any level. It can also be demonstrated that the more stringent the test, the larger the t statistic required for significance for every sample size to infinity.

Since this study has large sample sizes, there is the possibility that the smallest difference between means would be assumed statistically significant. For that reason, the .001 level of significance was chosen rather than .01. This further lowers the probability of making Type I errors to about 1 in 100.

Some other statistical procedure to test for significance might have been preferable to multiple *t* tests. Analysis of variance with repeated measures was considered, but due to the fact that sample sizes changed across the years as students dropped from the university, repeated measures could not be secured for all members of the samples at all measurement stages. As a result of a search of the literature and conversations with statisticians at North Texas State University, and in the School of Criminal Justice at Sam Houston State University, and in educational psychology at the University of Texas at Austin, no statistical procedure was found that would be better than the *t* test as a treatment for the data in this study.

In calculating mean cumulative grade-point averages and mean cumulative semester hours credit, the records are used only for the students who persisted during the specified time period. This gives a clearer picture of the performance of the students who were still in pursuit of a degree.

Summary

This chapter describes the population for this study, the procedures used to collect the data, and the statistical techniques used to analyze the data. The following chapter contains the results of the analysis of the data.

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CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

In order to simplify the statistical presentation, the data are presented in six categories. The first category, Demographics, describes the study groups and in some cases, compares these groups to the populations from which they were drawn. Comparisons are included to demonstrate similarities between the study groups and the total freshman class. Also included is information about the race, sex, age, marital status, and size of each group.

The second category, College Choice, compares the study groups with each other and with the total freshman class based on the college of original entry. The third category, Academic Abilities, includes data about the high school percentile ranks and entrance examination scores of the study groups and of all freshman upon entry into the university. The fourth category, College Performance, includes information on the college grade-point averages and the probation and suspension records of the study groups.

Progress Toward Graduation is the fifth category; it includes information about student persistence and cumulative semester hours earned over the five years of the study. The

sixth category, Graduation, includes comparisons of the graduation rates and the demographic and academic characteristics of the students who graduated from both study groups.

In the section entitled Tests for Significant Difference, data are presented to demonstrate significant differences between the study groups. The data analyses are grouped by major hypotheses; i.e., data testing for significant differences in academic success are grouped, data testing for progress toward graduation are grouped, and data testing for graduation rates are combined.

Demographic Data

Demographic data collected include information about the study groups' sex, race, age, and marital status. Each of these variables is discussed separately.

Sex

Table IV data show the demographics for the ARC and REG study groups and for all freshmen by sex, race, and marital status. Although over 50 per cent of each group are female students, the REG group and all freshmen are notably balanced by sex (REG = 53.4 per cent female; all freshmen = 53.5 per cent female). The ARC group contains a higher proportion of female students (56.1 per cent).

TABLE IV

SEX, RACE, AND MARITAL STATUS OF REG, ARC, AND TOTAL FRESHMEN STUDENTS

Variable	REG Students		ARC Students		Total Freshmen	
	N	%	N	%	N	%
Sex						
Male	163	46.6	136	43.6	3,621	46.5
Female	187	53.4	174	56.1	4,163	53.5
Total	350	100.0	310	100.0	7,784	100.0
Race						
Caucasian	298	85.1	237	76.5	6,612	84.9
Black	39	11.1	65	21.0	771	9.9
Mex. Amer.	12	3.4	8	2.6	242	3.1
Other	1	0.3	0	0.0	159	2.0
Total	350	100.0	310	100.0	7,784	100.0
Marital Status						
Married	21	6.0	20	6.5	931	12.0
Single	329	94.0	290	93.5	6,853	88.0
Total	350	100.0	310	100.0	7,784	100.0

Race

The ARC group differs from both the REG group and the total freshman class since it contains a larger proportion of minority students, particularly blacks. The ARC group consists of 21 per cent black students, which is a larger percentage than that of the REG group and the total freshman group (REG = 11.1 per cent; total = 9.9 per cent). The fact that there are no students in the ARC group and only one in the REG group who are classified as "other" can be partially explained by the fact that all foreign students were eliminated from the two study groups.

Marital Status

The proportion of ARC and REG students who are married is approximately equal (ARC = 6 per cent; REG = 6.5 per cent). However, the proportion of the total freshman class who are married is twice that of either study group. An examination of the raw data shows that the elimination of foreign and transfer students from the study groups also eliminated a large number of married students. This explains the large differences in the proportions shown by data in Table IV.

Age

Table V data show the mean age and age distributions for both groups and the total freshman class. By mean age, the ARC and REG groups are nearly identical (ARC = 19.47;

TABLE V

AGE DISTRIBUTIONS OF REG, ARC, AND TOTAL FRESHMEN STUDENTS

Age	REG Students*		ARC Students*		Total Freshmen*	
	N	%	N	%	N	%
18-under	126	61.9	180	58.3	2,661	34.3
19-22	108	31.0	107	34.6	3,825	49.3
23-26	8	2.4	7	2.2	648	8.3
27-30	8	2.4	3	0.9	287	3.7
31-over	9	2.7	12	3.6	332	4.4
Total	349	100.0	309	100.0	7,753	100.0

*Mean ages: REG = 19.45; ARC = 19.47; Total = 20.74.

(REG = 19.45) while the mean age of the total freshman class is about one year older (20.7). This difference may be explained by the fact that the total freshman class contained transfer students who are presumably older because they have been in college previously. From the age distributions, nearly half (49.3 per cent) of the freshman class are between the ages of 19 and 22, while only a third of the ARC (34.6 per cent) and REG (31 per cent) are in this age group. Both the REG and ARC groups have higher proportions of 18 year old or younger students than does the total freshman class (REG = 61.9 per cent; ARC = 58.3 per cent; total freshmen = 34.3 per cent).

College Choice

As shown by Table VI data, there are some similarities in the choice of college or school made by all students regardless of study group. The largest percentage of students within all groups enrolled in the College of Arts and Sciences (REG = 52.3 per cent; ARC = 55.8 per cent; total = 48.5 per cent), followed by the College of Business (REG = 22.3 per cent; ARC = 21.6 per cent; total = 25.4 per cent). These two colleges account for about 75 per cent of all students. An explanation regarding North Texas State University's policy is helpful in interpreting this finding. During this time, any student who entered as an undecided major was placed in

TABLE VI

BEGINNING COLLEGE CHOICE OF REG, ARC, AND TOTAL FRESHMEN STUDENTS

College	REG Students		ARC Students		Total Freshmen	
	N	%	N	%	N	%
Arts and Science	183	52.3	173	55.8	3,779	48.5
Business	78	22.3	67	21.6	1,977	25.4
Education	21	6.0	38	12.3	901	11.6
Home Ec.	11	3.1	13	4.2	280	3.6
Music	48	13.7	12	3.9	653	8.4
Community Services	1	0.3	0	0.0	6	0.1
Unclassified	8	2.3	7	2.3	188	2.4
Total	350	100.0	310	100.0	7,784	100.0

the College of Arts and Sciences. This partially explains why one out of two students are enrolled in this college.

There are some notable differences between the ARC and REG groups in the colleges or schools they chose to enter. For instance, the ARC students were more likely to choose education (ARC = 12.3 per cent; REG = 6 per cent) and less likely to choose music (ARC = 3.9 per cent; REG = 13.7 per cent) than were the REG students.

Academic Abilities

In Chapter III the fact was discussed that applicants to the university are required to submit, for admission, rank in class and SAT or ACT scores. High school rank, SAT, and ACT score are used in this study to describe the academic abilities of the groups upon their entry into the university.

High School Performance

One measure of high school performance is how well the student performed relative to all students in his class, and this percentile rank measure is used in the study. The data on percentile ranks and standard deviations of REG students, ARC students, and the total freshman class are presented in Table VII.

The REG group's mean percentile rank (70.9) is slightly higher than that of the total freshman class (67.5). The rank mean of the ARC group is exactly one standard deviation

TABLE VII

MEAN HIGH SCHOOL PERCENTILE RANK AND COLLEGE ENTRANCE TEST SCORES OF REG, ARC, AND TOTAL FRESHMEN

	REG Students			ARC Students			Total Freshmen		
Percentile Rank	N	Mean	SD	N	Mean	SD	N	Mean	SD
	304	70.9	22.1	267	48.8	18.8	3,969	67.5	26.3
Test									
ACT:									
Eng.	90	19.4	4.1	117	15.3	4.1	1,401	19.1	4.7
Math	90	18.2	6.2	117	11.6	5.0	1,401	17.5	6.6
So.Sci.	90	18.8	6.9	117	12.3	5.0	1,401	18.0	6.7
Nat.Sci.	90	21.8	5.8	117	16.7	4.9	1,401	21.2	5.9
Comp.	90	19.7	4.9	117	14.1	3.6	1,401	19.1	5.0
SAT:									
Verbal	259	435	91	215	340	71	3,471	429	95
Math	259	459	100	215	351	62	3,471	449	98
Total	259	894	166	215	691	110	3,471	878	171

below that of the REG group, i.e., the rank mean of the REG group is 70.9 with a standard deviation of 22.1, and the percentile rank equal to one standard deviation below the mean of the REG group is 70.9 - 22.1 = 48.8, which is the rank mean of the ARC group.

These data differences in distributions of high school percentile ranks are shown in Table VIII. Slightly more than 50 per cent of the REG group clustered above the seventy-fifth percentile rank (in the top quarter of their class), while only 1 per cent of the ARC group were above the seventy-fifth percentile rank.

The ARC students, who ranked in the first quartile, which would have made them automatically eligible for admission, failed to submit a test score in time for registration and were therefore referred to the admission review committee. Since submitting a test score was part of the requirements for entry, failure to submit automatically placed a student in the presumptive-deny category and he was referred to the review committee.

The reason why the number of students with a class ranking is less than the total number in each group, is that not all high schools were willing to report class ranks for their students. In these cases students were made eligible on test score alone.

TABLE VIII

DISTRIBUTION OF HIGH SCHOOL PERCENTILE RANKS FOR REG AND ARC STUDENTS

Percentile Rank Interval	REG Students			ARC Students		
	N	Cumulative N	Cumulative %	N	Cumulative N	Cumulative %
100-96	34	304	100.0	0	0	100.0
95-91	32	270	89.0	2	267	100.0
90-86	33	238	78.3	0	265	99.3
85-81	33	205	67.4	1	265	99.3
80-76	25	172	56.6	1	264	98.9
75-71	16	147	48.4	27	263	98.5
70-66	22	131	43.0	30	236	88.4
65-61	24	109	36.0	26	206	77.2
60-56	14	85	28.0	28	180	67.4
55-51	13	71	23.4	20	152	56.9

TABLE VIII--Continued

Percentile Rank Interval	REG Students			ARC Students		
	N	Cumulative N	Cumulative %	N	Cumulative N	Cumulative %
50-46	12	58	19.1	23	132	49.4
45-41	10	46	15.1	23	109	40.8
40-36	8	36	11.8	23	86	32.2
35-31	7	28	9.2	13	63	23.6
30-26	9	21	7.0	8	50	18.7
25-21	6	12	4.0	20	42	15.7
20-16	2	6	2.0	11	22	8.2
15-11	2	4	1.4	4	11	4.1
10-6	2	2	0.7	4	7	2.6
5-1	0	0	0.0	3	3	1.0
Total	304	. .	. .	267	. .	. .

Test Performance

As described in Chapter III, North Texas State University permitted students to submit either an SAT or ACT score for admission purposes. In addition, foreign students and a large percentage of transfer students were not required to submit scores. For these reasons, the number of observations on test scores (see Table VII data) varied across groups. These occurrences of missing data were assumed to occur randomly across the groups and as such minimized the potential for introducing bias into the data.

ACT performance.--Although the data in Table VIII show that the mean ACT score of the REG students (19.7) is slightly higher than that of the total freshman class (19.1) it is considerably higher than that of the ARC students (14.1). Across all ACT score areas, the mean of ARC students is one standard deviation below that of the REG students. The ACT natural science area score is the highest of the five ACT scores reported for all groups.

As previously noted, 99 per cent of the ARC students fell somewhere below the first quartile in high school percentile rank. This means that for 99 per cent of the ARC students, satisfactory performance on one of the entrance examinations was the only way they could have qualified for admission. If the student scored as high as 20 on the ACT-C, he was eligible regardless of rank. Since an ACT-C score of

20 or above would qualify a student for admission regardless of rank it would be expected that there would be no scores of 20 or above for ARC students. In fact, as is shown by the data in Table IX five ARC students submitted scores of 20 or above.

That there were five students who scored 20 or above in the ARC group, and would presumably have been eligible but were not, can be explained in two ways. First, high school graduation was a requirement under the regular admission policy; students who submitted General Education Development (GED) certificates in lieu of high school diplomas were required to petition the review committee regardless of scores. Second, a few students who were admitted through the review committee later repeated the test and had their lower scores replaced with higher scores.

As can be seen from the distribution of ACT-C scores (Table IX), 30 per cent of the REG group and 88 per cent of the ARC group scored below 18, which is the minimum acceptable score for students who were not in the top quartile of their graduating class. The occurrence of scores below 18 in the REG group may be accounted for in two ways. Either the students were in the first quartile of their graduating class, in which case scores did not matter or, having scored too low on the ACT, they took the SAT and scored high enough to be admitted.

TABLE IX

DISTRIBUTION OF ACT COMPOSITE SCORES OF REG AND ARC STUDENTS

Score Intervals	REG Students			ARC Students		
	N	Cumulative N	Cumulative %	N	Cumulative N	Cumulative %
29	1	90	100.0	0	0	100.0
28	2	89	98.9	0	0	100.0
27	4	87	96.7	1	117	100.0
26	5	83	92.2	1	116	99.1
25	5	78	86.7	0	115	98.3
24	7	73	81.1	0	115	98.3
23	3	66	73.3	1	115	98.3
22	8	63	70.0	0	114	97.4
21	1	55	61.1	1	114	97.4
20	12	54	60.0	1	113	96.6
19	8	42	46.7	2	112	95.7
18	7	34	37.8	7	110	9.40
17	4	27	30.0	12	103	88.0
16	3	23	25.6	16	91	77.8
15	6	20	22.2	14	75	64.1

TABLE IX--Continued

Score Intervals	REG Students			ARC Students		
	N	Cumulative N	Cumulative %	N	Cumulative N	Cumulative %
14	5	14	15.6	8	61	52.1
13	1	9	10.0	17	53	45.3
12	4	8	9.0	5	36	30.8
11	0	4	4.4	14	31	26.5
10	2	4	4.4	8	17	14.5
9	1	2	2.2	7	9	7.6
8	1	1	1.1	0	2	1.7
7	0	0	0.0	0	2	1.7
6	0	0	0.0	0	2	1.7
5	0	0	0.0	0	2	1.7
Total	90	. .	. .	117	. .	. .

SAT performance.--As shown by the mean SAT scores in Table VII, the pattern of differences between the groups is about the same as noted on previous variables. On the SAT-Verbal, SAT-Math, and SAT-Total, the mean scores of the REG group are slightly higher than those of the total freshman class and at least one standard deviation above the means for the ACT group.

As expected from an examination of the data distribution of SAT-total scores for the REG and ARC students in Table X, the scores of the ARC group cluster below 800 (93 per cent), which is the score that would have made them eligible regardless of rank in class. The scores of the REG group cluster at or above 800 (72 per cent).

In summary, when comparing data for the REG group with the ARC group, both groups have about the same ratio of females to males, about the same mean age, and about the same ratio of married to single students; the ARC group, however, has a larger proportion of black students. The ARC students are slightly more likely to be enrolled in the College of Arts and Sciences, about as likely to be in the College of Business, much more likely to be in the College of Education, and, not nearly as likely to be in the School of Music as are the REG students. Across all measures of academic abilities upon university entrance, the ARC students' means are at least one standard deviation below the means of the REG students.

TABLE X

DISTRIBUTION OF SAT-TOTAL SCORES OF REG AND ARC STUDENTS

Score Intervals	REG Students			ARC Students		
	N	Cumulative N	Cumulative %	N	Cumulative N	Cumulative %
1350-1300	4	259	100.0	1	215	100.0
1299-1250	2	255	98.5	1	214	99.5
1249-1200	6	253	97.7	0	213	99.1
1199-1150	9	247	95.4	1	213	99.1
1149-1100	10	238	91.9	0	212	98.6
1099-1050	20	228	88.1	1	212	98.6
1049-1000	18	208	8.03	2	211	98.1
999-950	24	180	73.4	1	209	97.2
949-900	31	166	64.1	1	208	96.7
899-850	26	135	52.1	4	207	96.3
949-800	37	109	42.1	4	203	94.4
799-750	33	72	27.8	15	199	92.6

TABLE X--Continued

Score Intervals	REG Students			ARC Students		
	N	Cumulative N	Cumulative %	N	Cumulative N	Cumulative %
749-700	17	39	15.1	60	184	85.6
699-650	8	22	8.5	63	124	57.7
649-600	6	14	5.4	36	61	28.4
599-550	3	8	3.1	9	25	11.6
549-500	2	5	1.9	16	16	7.4
499-450	3	3	1.2	0	0	0.0
Total	259	. .	. .	215	. .	. .

College Performance

Although there are a number of ways to evaluate student performance in college (e.g., students' contribution to leadership in the student body, students' civil behavior, or contributions in athletics), for the purpose of this study, the measure used is student performance in the classroom as evaluated by professors and noted in grade points earned. This is not to imply that student successes in other areas are not important, but rather that grade-point average is the most often used, readily understood, and easily quantified measure of student success. It represents a composite of all the evaluations of the students' work by all the professors who had instructed him, and as such appears to be a fair measure upon which to base a comparison.

Cumulative grade-point averages (CGPA) were calculated only on persisters. If students had not completed coursework during the period for which calculations were made, their grade-point averages were not included.

A second useful measure of student performance in college and one that is closely related to grade-point average, is the students' records of academic probation and suspension. Probation is a warning to the student that his work is not satisfactory; suspension from the university occurs if the student does not improve after being placed on probation. The university rules during the period of this study stated that a

student who was suspended for the first time had to remain out of school for one semester; upon the second suspension the student remained out for one year; the third suspension was indefinite, and the student could return only with special permission from his dean.

Grade Point Averages

Displayed in Table XI are the comparative data for mean CGPAs of REG and ARC students at various time segments over the five years covered by this study. The data also include the number of observations upon which the calculations were made.

Table XI data show that the CGPA performance of the REG group was higher than that of the ARC group at every time segment over the five-year period of the study. The test for significant differences between these observed means are discussed in detail later, but it is noteable that although the entrance means (test scores and rank-in-class) of the ARC group are consistently one standard deviation below those of the REG group, at no time over the five-year period were ARC CGPAs as much as one standard deviation below those of the REG group. This indicates that once the two groups entered upon a common course of study, the ARC group performed better than could have been expected relative to the performance of the REG group.

TABLE XI

MEAN CUMULATIVE GRADE-POINT AVERAGES OF REG AND ARC PERSISTERS* AT VARIOUS TIME SEGMENTS OVER THE FIVE-YEAR

Time Periods	REG Persisters			ARC Persisters		
	N	Mean GPA	SD	N	Mean GPA	SD
First Sem.	319	2.52	.89	273	1.72	.85
First Year	324	2.45	.93	280	1.72	.79
Second Year	212	2.59	.79	162	2.06	.58
Third Year	156	2.72	.69	120	2.17	.59
Fourth Year						
All Students	142	2.78	.67	100	2.28	.55
Non-Grad.**	89	2.50	.63	86	2.21	.55
Graduates***	53	3.24	.44	14	2.28	.28
Fifth Year						
All Students	81	2.64	.55	73	2.31	.57
Non-Grad.**	48	2.50	.61	47	2.18	.58
Graduates***	33	2.83	.41	26	2.56	.46

*Persisting students are defined as those who completed coursework during any semester of the time period specified.

**These data are for persisters during the fourth or fifth years who did not graduate that year.

***These data are for graduates only.

The mean cumulative grade-point average of the REG group (2.52) is only .8 of a grade point higher than that of the ARC group (1.72) at the end of the first semester. Neither group raised their mean by the end of the first year over that of the first semester. As a matter of fact, the REG group mean decreased to 2.45 by the end of the year, while that of the ARC group remained the same at 1.72. The gap between the two groups narrowed somewhat to .73 of a grade point.

By the end of the second year, the ARC group had raised their mean CGPA by about one-third of a point to 2.06, which exceeded 2.0 for the first time. The REG group had a slight increase in mean to 2.59. The gap between the two groups had narrowed further to .53 of a grade point.

By the end of the third year, the REG group had raised their mean CGPA by about one-fourth of a point over that of their first semester, from 2.52 to 2.72. The ARC group also continued to make progress by raising their mean CGPA by nearly one-half point over their first semester, from 1.72 to 2.17. They remained behind the REG group, however, by .55 of a grade point.

As shown in Table XI, calculations of the data for the fourth and fifth years of study were performed on all students and on two subgroups--graduates and nongraduates. The subgroup of graduates was identified in order to facilitate the

testing of one of the hypotheses of the study. The sub-group of nongraduates was identified to facilitate the tracking of students in their continued pursuit of a degree.

The data in Table XI for all students demonstrated that both study groups were continuing to raise their mean grade-point averages. The REG group mean rose to 2.78, while that of the ARC group rose to 2.28. The gap between the two groups narrowed to one-half of a grade point.

In the data for the sub-groups of graduates and non-graduates, several items are notable. First, for both the REG and ARC groups, the mean grade-point averages of the graduates (REG = 3.24; ARC = 2.28) are higher than those of the nongraduates (REG = 2.50; ARC = 2.21). This is not particularly surprising since the degree requirements for nearly every major at the university are such that students have to take extra course hours (more than fifteen) in order to graduate in four years (eight long semesters). Typically, only the academically stronger students enroll for such heavy course loads, and one would expect the academically stronger students to have the higher grade-point averages.

Second, graduates in the REG group have a mean CGPA of 3.24. This mean is nearly one grade point (.96) above that of the ARC graduates (2.28).

Third, the mean grade-point average of the REG students who did not graduate at the end of the fourth year is 2.51 and

.3 of a grade point higher than that of the ARC nongraduates (2.21). These nongraduates are those who were eligible to persist into their fifth year.

The data for the total students for the fifth year of the study reveals that the REG group maintained the higher mean CGPA. The mean CGPA for all students in the REG group is 2.64, one-third of a grade point higher than the mean of the ARC group (2.31).

The mean CGPA of the graduates at the end of the fifth year for the REG students is 2.83 compared to 2.56 for the ARC group. This represents a difference of only .27 of a grade point. Those still in pursuit of a degree after five years had a lower mean grade-point average (REG = 2.50; ARC = 2.18) than did the fifth year graduates (REG = 2.83; ARC = 2.56). In other words, the less able students did not graduate in as high a proportion as did the more able, although they were still in there trying.

Academic Probation and Suspension

The second measure of college performance considered in the study is the probation and suspension history of the two groups. Displayed in Table XII is the summation of these data for the five years covered by the study. Since probation and suspension policies are directed at responding to students' cumulative performance, these data are presented in a cumulative fashion rather than by year.

TABLE XII

NUMBER AND PERCENTAGE OF REG AND ARC STUDENTS WHO HAD BEEN PLACED ON ACADEMIC PROBATION OR SUSPENSION DURING THE FIVE-YEAR PERIOD

Status	REG Students (N=350)		ARC Students (N=310)	
	Number	Per Cent	Number	Per Cent
Academic Probation	86	24.6	153	49.4
Suspension	48	13.7	75	24.2

As can be seen from the data in Table XII, nearly 50 per cent of the beginning number of ARC students were on academic probation at some time during the five-year period of this study. By comparison, only half that proportion (24.6 per cent) of the beginning number of REG students had been on probation. About one in four of the ARC students and one in seven of the REG students were academically suspended at some time during the five-year period.

In summary, the ARC group did not perform as well as the REG group as measured by grade-point averages and academic probation and suspension records. The difference between the grade-point averages of the two groups were not as large, however, as might have been expected considering the greater differences in their entry requirement measures. The differences in the proportions of the REG and ARC students who were on academic probation or suspension, however is quite

large, which is an indication of the academic difficulties encountered by the ARC students.

Progress toward Graduation

While it is recognized that the degree aspirations and goals of students do vary, it was assumed for this study that all students entering the university had hopes of eventually attaining an undergraduate degree and would, if academically possible, remain at the university to do so. Obviously, all students had the option of quitting at any time or of transferring to another institution to complete their studies. It was assumed that these occurrences would randomly happen across both groups.

It was not possible from the available data to determine which students transferred and finished their degrees elsewhere. While these data on progress toward graduation and actual graduation may not totally represent the academic achievements of either group, this study is designed to trace the academic histories of those students who could potentially be associated with the university in the pursuit of an undergraduate degree, and the data in this section are presented with that intention.

Persistence

A brief statement of the definition of a persisting student as used in this study is given as a footnote to Table XIII, but, in order to understand more clearly the data in

Table XIII, an expansion of this definition follows. A student is classified as persisting for the time period under discussion if the student completed any coursework during that academic time period. For example, during any academic year a student had four opportunities to complete course work. These were the Fall, Spring, Summer I and Summer II semesters. If a student completed coursework during one of these semesters for the year in question, the student was classified as a persister and his data were included in any calculations for that year.

The data in Table XIII show that 91 per cent of the REG group and only 88 per cent of the ARC group persisted through the first semester. Some of the dropouts evidently returned to class during the spring or summer sessions because, by the end of the first year, more students in both groups had taken coursework during the year than had completed the first semester. In the REG group, 92.6 per cent completed course-work during the first year as compared to 90.3 per cent of the ARC group.

The single, most dramatic decline over the five-year period of the study in the number of beginning students who were still enrolled, occurred in the second year. Only 60.6 per cent of the entering REG group and 52.3 per cent of the ARC group completed coursework during the second year. The persistence rate from the first to the second years for the

TABLE XIII

NUMBER AND PERCENTAGE OF REG AND ARC STUDENTS WHO WERE PERSISTING*
AT VARIOUS TIME SEGMENTS OF THE FIVE-YEAR PERIOD

Time Period	REG Students (N = 350)			ARC Students (N = 310)		
	N	%	% From Previous Time Period	N	%	% From Previous Time Period
First Sem.	319	91.1	91.1	273	88.1	88.1
First Year	324	92.6	101.6	280	90.3	102.6
Second Year	212	60.6	65.4	162	52.3	57.9
Third Year	156	44.6	73.6	120	38.7	74.1
Fourth Year						
All Students**	142	40.6	91.0	100	32.3	83.3
Non-Grad.***	89	25.4	0.0	86	27.7	0.0
Fifth Year						
All Students	81	23.1	91.0	73	23.5	84.9
Non-Grad.***	48	13.7	0.0	47	15.2	0.0

*Persisting students are defined as those who completed coursework during any semester of the time period specified.

**These data are for persisters and graduates combined.

***These data are for persisters during the fourth or fifth years who did not graduate that year.

REG students is 65.4 per cent and 57.9 per cent for the ARC students. Conversely, the dropout rate between the first and second year for the REG group is 34.6 per cent and 42.1 per cent for the ARC group.

By the third year, 44.6 per cent (156) of the beginning number of REG and 38.7 per cent (120) of the ARC students were persisting. The persistence rates from the second to the third year for both groups are higher than they were from the first to second year. About three out of every four students who enrolled during the second year also enrolled during the third year. The dropout rates for both groups are also considerably lower between the second and third years than between the first and second. The dropout rate for both the REG and ARC group is 26 per cent between the second and third years.

For the fourth and fifth years of the study, a sub-set of students was identified. This sub-set contains persisters who had not graduated by the end of the year, which permits calculations of persistence into the fifth year of those who were elibible to enroll by virtue of their not having graduated. The sub-set for the fifth year also permits calculations of the proportions of both groups who were still in pursuit of a degree after five years.

A total of 142 REG students persisted into the fourth year (40.6 per cent of the first semester number of 350).

Once the REG students persisted through their third year, they were not likely to drop out; only 9 per cent did so (fourteen students). A review of the raw data on academic suspension reveals that these missing fourteen students could be partially accounted for by the fact that at the end of the third year eight were either on their second or indefinite suspensions. In either case they would not have been eligible to re-enroll during their fourth year.

Of the 310 beginning ARC students, less than one-third (100) persisted into the fourth year. Although the ARC students had a high persistence rate (83.3 per cent) between the third and fourth years, it was not as high as that of the REG students (91 per cent). Of the twenty ARC students who had not persisted from the third to fourth years, half were on either their second or indefinite suspension and were therefore not eligible to re-enroll.

Of the eighty-six REG persisters who had not graduated by the end of the fourth year, seventy-three (84.9 per cent) enrolled during the fifth year. This is a slightly higher persistence rate than noted between the third and fourth years, but not as high as the 91 per cent rate of REG students.

Cumulative Semester Hours Earned

A second measure of progress toward graduation is the number of semester hours students accumulated by various time

segments over the five-year period. Table XIV data show the mean number of cumulative semester hours earned by REG and ARC students at various time segments over the five-year period of the study.

For years four and five, data are presented for two sub-groups as well as for the total population. The first sub-group consists of persisting students who did not graduate that year, the second sub-group is composed of students who graduated. Arranging the data in this way permits a comparison of the study groups based on all students who earned semester hours during the year as well as on students who graduated.

As Table XIV data show, the REG students made faster progress than the ARC students toward graduation. Both groups made a relatively slow start; the ARC group earned a mean of twelve semester hours credit while the REG group earned slightly over thirteen in the first semester. These means are below the anticipated number, given the widely held view that students normally take fifteen to sixteen hours each semester.

By the end of the first year, both groups had added about twelve semester hours to their respective means. The ARC group had 22.6 mean cumulative semester hours while the REG group had 25.2. At the end of the second year of the study, the mean number of cumulative semester hours of the ARC group (47.2) is about five below that of the REG group (52.7).

TABLE XIV

MEAN CUMULATIVE SEMESTER HOURS OF REG AND ARC PERSISTERS* BY VARIOUS TIME SEGMENTS OVER THE FIVE-YEAR PERIOD

Time Period	REG Students (N = 350)			ARC Students (N = 310)		
	N	Mean Cum. Sem. Hrs.	SD	N	Mean Cum. Sem. Hrs.	SD
First Sem.	319	13.3	3.3	293	12.0	3.05
First Year	324	25.2	8.7	280	22.6	8.2
Second Year	212	52.7	13.1	162	47.2	11.8
Third Year	156	81.1	19.1	120	68.1	20.4
Fourth Year						
All Students	142	105.5	26.6	100	92.9	26.8
Non-Grad.**	89	97.4	28.9	86	89.0	26.8
Graduates***	53	119.1	13.9	14	116.5	8.1
Fifth Year						
All Students	81	113.4	29.1	73	105.1	27.6
Non-Grad.**	48	103.5	31.4	47	95.2	27.4
Graduates***	33	128.3	16.9	26	124.3	15.9

*Persisters are defined as those who completed coursework during any semester of the time period specified.

**These data are for persisters during the fourth and fifth years who did not graduate that year.

***These data are for graduates only.

By the end of the third year, the gap between the ARc (68) and REG (81) groups in terms of cumulative semester hours earned widens to thirteen hours (or the equivalent of about one semester's work). The mean of the REG group is still below what would normally be expected based on the university's classification for seniors of ninety semester hours.

By the end of the fourth year, the mean number of semester hour credits earned by all REG students is 105.5, which is about thirteen semester hours more than the ARC students had accumulated on the average (92.9). By the end of the fourth year, the non-graduating ARC students have eighty-nine mean cumulative semester hours compared to 97.4 for non-graduating REG students. The REG graduates had 119 mean cumulative semester hours compared to 116.5 for the ARC graduates, which amounts to less than three semester hours difference.

The mean cumulative semester hours credits for all REG students who completed coursework during the fifth year is 113.4 compared to 105.1 for the ARC students. The difference between the two groups is 8 semester hours. The REG non-graduates had accumulated 103.5 semester hours credit by the end of the fifth year compared to 95.2 for the ARC non-graduates. The fifth year REG graduates had accumulated 128.3 mean semester hours while the ARC graduates had accumulated 124.3.

Graduation

In this section, the graduation percentages of the two groups are compared. In addition, the graduates are compared by the variables of sex, race, age, marital status, and college or school from which they graduated.

Number of Graduates

This study covers a five-year period of academic work, from the fall semester of the students' first year through the second summer session of their fifth year. According to Table XV data, by the end of the fourth year 15 per cent (53) of the beginning REG students and 4.5 per cent (14) of the beginning ARC students graduated. Nearly 25 per cent (86) of the beginning REG students had graduated by the end of the five years, but only 13 per cent (40) of the beginning ARC students had graduated in the same period. Of the 86 REG graduates, 62 per cent (53) graduated in four years while only 35 per cent (14) of the 40 ARC graduates did so.

TABLE XV

NUMBER AND PERCENTAGE OF REG AND ARC BEGINNING STUDENTS WHO GRADUATED AFTER FOUR AND FIVE YEARS

Number of Years	REG Students (N=350)		ARC Students (N=310)	
	Number	Per Cent	Number	Per Cent
Four Years	53	15.1	14	4.5
Five Years	33	9.4	26	8.4
Total	86	24.6	40	12.9

Sex of Graduates

Table XVI data show the sex, race, marital status, and age of REG and ARC graduates. In the REG group females (26.7 per cent) graduated in higher proportions than did males (22.1 per cent). In the ARC group 16.1 per cent of the females graduated compared to 8.8 per cent of the males. By comparing across groups, a large difference exists between the proportion of REG (22.1 per cent) and ARC (8.8 per cent) males who graduate. The gap between REG and ARC females (REG = 26.7 per cent; ARC = 16.1 per cent, while large, is much less than that between REG and ARC males.

Race of Graduates

There is a notable difference (Table XVI) between the REG and ARC groups in the proportions of minority students who graduated. In the REG group blacks (15.4 per cent) and Mexican Americans (8.3 per cent) graduated in much lower proportions than did Caucasians (26.2 per cent) and much lower than would be expected given the overall graduation rate of 24.6 per cent.

In the ARC group, where the overall graduation rate is 12.9 per cent, Caucasians graduated at a lower than expected rate (11.8 per cent), while the proportion of blacks who graduated (16.9 per cent) is higher than expected. The Mexican Americans (12.5 per cent) also graduated at a slightly higher rate than did Caucasians (11.8 per cent). As a result

TABLE XVI

NUMBER AND PERCENTAGE OF REG AND ARC STUDENTS WHO GRADUATED BY SEX, RACE, MARITAL STATUS, AND AGE AT TIME OF ENTRY

Characteristics	REG Students (N = 350)					ARC Students (N = 310)				
	Beginning (1)		Graduating (2)		%	Beginning (3)		Graduating (4)		%
	N	%	N	%	(2)/(1)	N	%	N	%	(4)/(3)
Sex:										
Male	163	46.5	36	41.9	22.1	136	43.9	12	30.0	8.8
Female	187	53.4	50	58.1	26.7	174	56.1	28	70.0	16.0
Total	350	. .	86	. .	24.6	310	. .	40	. .	12.9
Race:										
Caucasian	298	85.1	78	90.7	26.2	237	76.5	28	70.0	11.8
Black	39	11.1	6	6.9	15.4	65	21.0	11	27.5	16.9
Mex. Amer.	12	3.4	1	1.2	8.3	8	2.6	1	2.5	12.5
Other	1	0.3	1	1.2	100.0	0	. .	. .	. .	. .
Total	350	. .	86	. .	34.6	310	. .	40	. .	12.9
Marital Status:										
Married	21	6.0	1	1.0	4.8	20	6.5	1	2.5	5.0
Single	329	94.0	85	99.0	25.8	290	93.5	39	97.5	13.5
Total	350	. .	86	. .	24.6	310	. .	40	. .	12.9
Age:										
18-under	216	61.7	66	76.7	30.6	180	58.0	22	55.0	12.2
19-22	108	30.8	19	22.1	17.6	107	34.5	17	42.5	15.9

TABLE XVI--Continued

Characteristics	REG Students (N = 350)					ARC Students (N = 310)				
	Beginning (1)		Graduating (2)		% (2)/(1)	Beginning (3)		Graduating (4)		% (4)/(3)
	N	%	N	%		N	%	N	%	
Age (Cont.)										
23-26	8	2.3	. .	. .	. .	7	2.3	. .	. .	. .
27-30	8	2.3	. .	. .	. .	3	1.0	. .	. .	. .
31-over	9	2.6	1	1.2	11.11	12	3.9	1	2.5	8.3
Total	350	. .	86	. .	24.6	310	. .	40	. .	12.9

*Mean ages: REG beginning students = 19.4; REG graduating students = 18.4; ARC beginning students = 19.5; ARC graduating students = 18.9.

of higher than expected graduation rates among minorities, the ARC graduating class was composed of only 70 per cent Caucasians while the entering ARC class was composed of 76.5 per cent Caucasians.

Black and Mexican American students in the ARC group also graduated in higher proportions than did their counterparts in the REG group. Of the ARC blacks, 16.9 per cent graduated while only 15.4 per cent of the REG blacks did so. The 12.5 per cent graduation rate among ARC Mexican Americans is also higher than the 8.3 per cent rate among REG Mexican Americans.

Marital Status of Graduates

Marital status is one of the characteristics that could have changed over the five years of this study. Since one of the purposes of this study was to track students with certain characteristics upon entry, marital status is held constant over the five-year period. The data in Table XVI are representative of the students' status upon entry.

Of the students in both groups who were married at the time they entered the university, only 5 per cent graduated (only one student in each group). There were 21 REG and 20 ARC students who were married when they entered the university.

Age of Graduates

The data in Table XVI show the mean ages and age distribution for the REG and ARC students at the time they entered the university. Clearly, the majority of graduates regardless of group are 18 or younger upon entry into the university. The raw data show that upon entry only 1 graduate was under 18 years of age and only 3 graduates were over the age of 19; if these students are not considered, all graduates were either 18 or 19 years of age upon entry. These ages are what one normally expects of recent high-school graduates. In both groups, the recent high school graduate was most likely to graduate within five years. The mean age of the ARC graduates upon entry was 18.8, only slightly higher than the 18.4 of the REG graduates.

College or School of Graduation

Table XVII contains data on the student groups' college or school of entry and the college or school of graduation within the university. The data for graduates are the number of graduates who were originally enrolled in that college or school. Attrition within colleges and schools could occur in at least two ways. A student could have left the university entirely or could have moved to another college or school within the university; it could not be determined from the data which attrition cause was being demonstrated.

TABLE XVII

NUMBER AND PERCENTAGE OF REG AND ARC GRADUATES BY GRADUATING COLLEGE OR SCHOOL AND BY COLLEGE OR SCHOOL OF ORIGINAL ENTRY

College or School	REG Students (N = 350)					ARC Students (N = 310)				
	Enter. (1)		Grad. (2)		% (2)/(1)	Enter. (3)		Grad. (4)		% (4)/(3)
	N	%	N	%		N	%	N	%	
Arts and Sciences	183	52.3	33	38.7	18.0	173	55.8	17	42.5	9.8
Business	78	22.3	32	37.2	41.0	67	21.6	7	17.5	10.5
Education	21	6.0	8	9.3	38.0	38	12.3	10	25.0	26.3
Home Economics	11	3.1	3	3.5	27.3	13	4.2	5	12.5	38.5
Music	48	13.7	10	11.6	20.8	12	3.9	1	2.5	8.3
Community Service	1	0.3	0	. .	. .	. .	. .	. .	. .	. .
Unclassified	8	2.3	0	. .	. .	7	2.7	. .	. .	. .
Total	350	. .	86	. .	24.6	310	. .	40	. .	12.9

Since all undecided majors are placed in the College of Arts and Sciences upon entry, graduation rates from Arts and Sciences was expected to be among the lowest in the university; these undecided majors could have chosen a major that took them outside the College of Arts and Sciences. Surely, many did. As was expected, the 18 per cent graduation rate for Arts and Sciences was the lowest rate among REG graduates and next to the lowest (9.8 per cent) among ARC graduates; only ARC School of Music majors graduated at a lower rate (8 per cent). The highest graduation rate (41 per cent) among REG students is in the College of Business, which is the highest graduation rate in either group. The graduation rate among ARC students who entered the College of Business is only 10.5 per cent, which is lower than the overall graduation rate of ARC students (13 per cent). At 38 per cent the College of Education has the second highest graduation rate among REG graduates, and the second highest (26.3 per cent) among ARC graduates; among ARC graduates, the School of Home Economics had the highest graduation rate at 38.5 per cent compared to 27.3 per cent for REG graduates. The graduation rate from the School of Music for the ARC group was the lowest (8.3 per cent) compared to 20.8 per cent for the REG students.

It should be noted that although the College of Arts and Sciences shows low graduation rates, the largest

proportion of graduates in both groups is from this college (REG = 38.7 per cent; ARC = 42.5 per cent). The College of Business accounts for 37.2 per cent of all REG graduates and 17.5 per cent of all ARC graduates. The College of Education accounts for 9.3 per cent of the REG graduates and 25 per cent of the ARC graduates. The School of Home Economics accounts for 3.5 per cent of the REG graduates and 12.5 per cent of the ARC graduates. The School of Music accounts for 11.6 per cent of the REG graduates and 2.5 per cent of the ARC graduates. The School of Community Services had no graduates in either group; and only one student entered in Community Services. Since students who were unclassified upon entry would have had to be classified before graduation, there were no unclassified graduates.

In summary, when the college performance of ARC students is compared to that of REG students, it appears that REG students maintained higher grade-point averages, were on academic probation or suspension less often, accumulated more semester hours credit each year, and graduated sooner and in larger proportion than did ARC students. Across both groups, female and single students graduated in higher proportions than did males. Minority students in the ARC group graduated in higher proportions than did minorities in the REG group and in higher proportions than did the Caucasians in the ARC group. The Colleges of Arts and

Sciences and Business combined accounted for over 50 per cent of all graduates from both groups.

Tests for Significant Differences

Having determined the nature of some of the differences in performance and progress toward graduation of the REG and ARC student groups in previous sections, this section deals with the test for statistical significance of any observed differences. The standard t test for large samples is used to determine the significant differences between various group means. Chao states that for large samples (N greater than 30) with known variances, it is permissible to "apply the normal distribution for inferences about the difference between two means regardless of the nature of the population distribution" (11, p. 260). Consequently the z distribution in the standard normal curve is used. A two-tailed test was chosen and the critical value of the test statistic is ± 3.291 at the .001 level. It is assumed that the two samples are independent. The .001 level of significance was selected to help minimize the probability of making Type I errors when using a series of t tests. A full discussion of this problem is provided in Chapter III.

The chi-square technique for independent samples is used to determine the significant differences between various proportions as was discussed in Chapter III. Two levels of significance are used. At the .05 level of significance,

the critical value of chi-square with 1 degree of freedom is ±3.84; for the .01 level of significance, the critical value of chi-square with one degree freedom is ±6.64.

College Performance

The data on statistical differences for college performance are divided into two categories. These tested categories include the REG and ARC student groups mean cumulative grade-point averages and records of academic probation and suspension.

Mean cumulative grade-point averages.--Table XVIII data show the *t* statistics for the significant differences between the mean cumulative grade-point averages of REG and ARC students. This testing procedure is related to hypothesis one.

Hypothesis one predicts that there will be no significant differences between the cumulative mean grade-point averages of the study groups (a) at the end of the first semester, (b) at the end of the first year, (c) at the end of the second year, (d) at the end of the third year, (e) at the end of the fourth year, (f) at the end of the fifth year, and (g) at the time of graduation. As indicated by the data in Table XVIII, all subsections (a through g) of hypothesis one are rejected. For all time segments of the five-year period of the study, the grade-point average of the

TABLE XVIII

COMPARISON OF THE MEAN GRADE-POINT AVERAGES OF REG AND ARC STUDENTS AT VARIOUS TIME SEGMENTS OVER THE FIVE-YEAR PERIOD: *t* STATISTICS AND LEVELS OF SIGNIFICANCE

Time Period	REG Students			ARC Students			*t* Statistics
	N	Mean GPA	SD	N	Mean GPA	SD	
First Sem.	319	2.52	.89	273	1.72	.85	-11.08*
First Year	324	2.45	.93	280	1.72	.79	-10.32*
Second Year	212	2.59	.79	162	2.06	.58	- 7.10*
Third Year	156	2.72	.69	120	2.17	.59	- 7.04*
Fourth Year	142	2.78	.67	100	2.28	.55	- 6.12*
Fifth Year	80	2.64	.56	71	2.31	.57	- 3.54*
Graduation	86	3.08	.77	40	2.63	.40	- 5.15*

*Significant at the .001 level (±3.291 critical value).

REG students is significantly higher than that of the ARC students.

Probation and suspension.--Hypothesis two predicts that there will be no significant difference between the proportion of each group who were on academic probation or suspension over the five years. For testing purposes the academic probation and suspension records of students were combined (if a student was on either probation or suspension, that sgudent was included in the calculations; if, however, the student was on both probation and suspension, the student was counted only one time). Of the beginning number (350) of REG students, 86 (24.6 per cent) were either on probation or suspended, of the ARC beginning number (310) of ARC students, 153 (49.4 per cent) were either on probation or suspended during the five-year period of this study. The chi-square test for significant differences between proportions produced a chi-square statistic of 43.35, which is significant at the .01 level (with one degree of freedom, critical values are .05 = ±3.84 and .01 = ±6.64).

Progress toward Graduation

Two hypotheses cover areas of progress toward graduation for the two groups of students for six time segments over the five-year period of this study. The first progress measure is persistence; the second progress measure is mean cumulative semester hours earned.

Persistence.--Hypotheses three predicts that there will be no significant differences between the two groups in the proportion who persist (a) through the first semester, (b) through the first year, (c) through the second year, (d) through the third year, (e) through the fourth year, and (f) through the fifth year if they had not graduated by the end of the fourth year.

Although there are significant differences between groups at the .05 level for persistence at the end of both the second and fourth years (Table XIX), these differences are not significant at the .01 level. Since, therefore, there are no highly significant differences in the proportion of REG and ARC students who persisted through the five-year period of this study, hypothesis three is accepted.

TABLE XIX

COMPARISON OF THE NUMBER AND PERCENTAGE OF REG AND ARC STUDENTS WHO PERSISTED AT VARIOUS TIME SEGMENTS OVER THE FIVE-YEAR PERIOD: CHI-SQUARE STATISTICS AND LEVELS OF SIGNIFICANCE

Time Period	REG Students		ARC Students		Chi-Square Statistic
	N	%	N	%	
First Semester	319	91.1	273	88.1	1.686
First Year	324	92.6	280	90.3	1.071
Second Year	212	60.6	162	52.3	4.627*
Third Year	156	44.6	120	38.7	2.322
Fourth Year	142	40.6	100	32.3	4.893*
Fifth Year	81	23.1	73	23.5	0.002

*Significant at the .05 level (±3.84 critical value with 1 degree of freedom).

Mean cumulative semester hours earned.--Hypothesis four predicts that there will be no significant differences between the mean cumulative semester hours earned by each group (a) at the end of the first semester, (b) at the end of the first year, (c) at the end of the second year, (d) at the end of the third year, (e) at the end of the fourth year, (f) at the end of the fifth year, and (g) at the time of graduation. These data are presented in Table XX.

There are significant differences between groups at the .001 level for mean cumulative semester hours earned for the time segments from the first semester through the fourth year of the study; therefore hypothesis four (a) through (e) are rejected. Data for the fifth year [hypothesis four (f)] and for graduation [hypothesis four (g)] are not statistically significant at the .001 level; therefore parts (f) and (g) of hypothesis four are accepted. Although REG students accumulated significantly more semester hours credit during the first four years than did the ARC students, there is no significant difference between the groups by the fifth year and at graduation.

Graduation

Hypothesis five predicts that there will be no significant differences between the study groups in the proportion who graduated after five years. Table XXI presents data on

TABLE XX

COMPARISON OF THE MEAN CUMULATIVE SEMESTER HOURS EARNED BY REG AND ARC STUDENTS BY VARIOUS TIME SEGMENTS OVER THE FIVE-YEAR PERIOD: *t* STATISTICS AND LEVELS OF SIGNIFICANCE

Time Period	REG Students			ARC Students			*t* Statistic
	N	Mean	SD	N	Mean	SD	
First Sem.	319	13.28	3.26	271	12.00	3.05	-4.86*
First Year	324	25.22	8.66	280	22.57	8.16	-3.85*
Second Year	212	52.66	13.07	162	47.20	11.76	-4.17*
Third Year	156	81.01	19.69	120	68.09	20.41	-5.32*
Fourth Year							
All Students	142	105.51	26.55	100	92.87	26.79	-3.63*
Graduates	53	119.13	13.92	14	116.50	8.05	-0.68
Fifth Year							
All Students	81	113.39	29.14	73	105.07	27.57	-1.80
Graduates	33	122.56	15.66	26	121.45	13.30	-0.38
All Graduates	86	120.45	14.79	40	119.72	10.68	-0.23

*Significant at the .001 level (±2.391 critical value).

those who graduated from both the REG and ARC groups at the conclusion of their fourth and fifth years.

TABLE XXI

COMPARISON OF THE NUMBER AND PERCENTAGE OF REG AND ARC STUDENTS WHO HAD GRADUATED BY THE END OF THE FIFTH YEAR: CHI-SQUARE STATISTICS AND LEVELS OF SIGNIFICANCE

Year Graduated	REG Students		ARC Students		Chi-Square Statistics
	N	%	N	%	
Year Four	53	15.1	14	4.5	11.994*
Year Five	33	9.1	26	7.7	0.416
Total	86	24.6	40	12.9	13.166*

*Significant at the .01 level (±6.64 critical value with 1 degree of freedom).

Although there is a statistically significant difference between the number of REG (53) and ARC (14) students who graduated at the end of four years, there is no statistically significant difference between the groups for the fifth-year segment. For the total graduation, there is a statistically significant difference at the .01 level between the groups, therefore, hypothesis five is rejected. A significantly larger proportion of the REG group graduated (REG = 24.6 per cent; ARC = 12.9 per cent).

Dropouts and Persisters

After completion of the outlined study, one question persisted. Was the improvement seen in cumulative grade-point

averages from year to year a result of the low-ability students dropping out or was it the result of actual improvements in the performance of those who persisted? A series of t tests were calculated to determine the significant differences between the academic abilities of persisters and dropouts during the first two years of the study. Dropouts and persisters were not compared beyond the first two years of the study because these first two are the years in which the largest percentage of the attrition took place and whatever pattern is observed here would probably hold true for the succeeding years.

The measures of academic ability used are the same measures used for entry into the university (i.e., SAT total scores or ACT-C scores and high school rank in class). The results of these t tests are shown in Table XXII for the REG students and XXIII for the ARC students. For the REG students there are no significant differences (at the .001 level) between the dropouts and persisters according to mean test scores or high school rank in class over the first two years of the study. The yearly increase in observed mean grade-point averages of the REG students is possibly due to improved performance in the class room.

The results of the tests for significant differences between the academic abilities of the ARC dropouts and persisters are somewhat mixed as seen from the data in Table XXIII. Although there are no significant differences

TABLE XXII

COMPARISON OF MEAN TEST SCORES AND HIGH SCHOOL RANK IN CLASS FOR REG DROPOUTS AND PERSISTERS AT VARIOUS TIME SEGMENTS OVER TWO YEARS: t-STATISTICS AND LEVELS OF SIGNIFICANCE

Time Period	REG Dropouts		REG Persisters		t-Statistics
	N	%	N	%	
First Sem.					
SAT-Total	20	863	239	896	-0.8627
ACT-C	3	18.0	87	19.8	-0.6192
H.S. Rank	21	57.9	283	71.9	-2.8200
First Year					
SAT-Total	15	896.6	244	893.6	-0.0682
ACT-C	3	18.0	87	19.7	-0.6192
H.S. Rank	17	60.1	287	71.5	-2.0662
Second Year					
SAT-Total	89	887.8	170	896.9	-0.4172
ACT-C	33	18.8	57	20.3	-1.3807
H.S. Rank	108	69.4	196	71.7	-0.8482

*Significant at the .001 level (±3.291 critical value).

in the mean test scores of ARC dropouts and persisters, there are, however, significant differences at the .001 level between the ARC dropouts and persisters when measured by high school rank in class. These differences appear at tne end of the first semester and again at the end of the first year. In the second year there are no significant differences between persisters and dropouts on any of the measures under study. However, when the observed differences of the mean grade-point averages of the ARC persisters between the first semester and first year are considered, a different possibility emerges. There is no improvement in mean grade-point average

TABLE XXIII

COMPARISON OF MEAN TEST SCORES AND HIGH SCHOOL RANK IN CLASS FOR ARC DROPOUTS AND PERSISTERS AT VARIOUS TIME SEGMENTS OVER TWO YEARS: t-STATISTICS AND LEVELS OF SIGNIFICANCE

Time Period	ARC Dropouts		ARC Persisters		t-Statistics
	N	%	N	%	
First Sem.					
SAT-Total	23	707.4	192	689.5	-0.7345
ACT-C	13	13.6	104	14.2	-0.5088
H.S. Rank	28	34.6	239	50.5	-4.3687*
First Year					
SAT-Total	19	700.5	196	690.5	0.3761
ACT-C	10	12.2	107	14.3	-1.7621
H.S. Rank	23	35.6	244	50.1	-3.6033*
Second Year					
SAT-Total	100	691	115	691.8	-0.0542
ACT-C	45	14.5	72	13.8	0.9945
H.S. Rank	123	45.8	144	51.5	-2.4962

*Significant at the .001 level (±3.291 critical value).

of the ARC students between the first semester (1.72) and the end of the first year (1.72). The fact that lower ranking students dropped out seems to have had no effect upon the mean grade-point average of the persisters. Since there are no significant differences in the academic abilities of ARC dropouts and persisters in the second year of the study, and the mean grade-point average of the persisters increased over that same period, this increase in possibly due to improved performance of the persisters.

Summary of Data Findings

The following findings are derived from the analyses of the data collected for this study. The findings are grouped according to major areas in order to simplify comparisons. The first major group of findings relate to the characteristics of students upon entering the university as measured by sex, race, marital status, and entering college or school within the university. The second major group lists the findings regarding academic performance as measured by mean cumulative grade-point averages and proportions in each group who were on academic probation or suspension over five years. The third group includes findings regarding student progress toward graduation as measured by persistence rates and mean cumulative semester hours earned by various time segments over the five-year period; also included are the findings regarding the proportions of REG and ARC students who graduated, by year of graduation. The final group of findings includes the characteristics of graduates as measured by sex, race, marital status, age, and college or school within the university from which they graduated.

Student Characteristics Upon College Entry

1. REG students were at least one standard deviation above ARC students on college entrance scores and high school rank.

2. Fifty-three per cent of the REG group and 56 per cent of the ARC group were females; the freshman class as a whole was composed of 54 per cent female students.

3. The ARC group had a higher percentage of minority students, particularly blacks, than did the REG group. Twenty-one per cent of the ARC students and 11 per cent of the REG students were black; the freshman class was 9.9 per cent black. Caucasians comprised 85 per cent of the REG students, and 76.5 per cent of the ARC students, and 84.9 per cent of the freshman class. Mexican Americans account for only 3.4 per cent of the REG population, 2.6 per cent of the ARC population, and 3.1 per cent of the freshman class.

4. Only 6 per cent of the REG students, 7 per cent of the ARC students, and 12 per cent of the freshman class were married.

5. The mean ages of both REG and ARC students were identical at 19.5 years of age. Comparing the REG and ARC groups, a smaller percentage of ARC students were 18 years of age and under, a slightly larger percentage of ARC students were between the ages of 19 to 22, fewer ARC students were over 22 years of age.

6. The College of Arts and Sciences enrolled over 50 per cent of both REG and ARC students; all undecided majors were placed in Arts and Sciences. ARC and REG students were

about equally likely to choose business as a major, but ARC students were nearly twice as likely to choose education. A much larger percentage of REG students enrolled in the School of Music.

7. REG students had higher mean grade-point averages than ARC students at each of the five year segments of the study; these differences were statistically significant at the .001 level for each year.

8. Although the differences between the mean grade-point averages of the REG and ARC students were statistically significant, the observed differences appear to be smaller than expected given the large difference in the academic abilities between the groups upon entry into the university.

9. The mean grade-point average of REG students was 2.45 (above a C average) at the end of the first semester, and it did not drop below this level over the five-year period. The ARC students' mean grade-point average was 1.72 (below a C average) at the end of the first semester, and only at the end of the second year did it rise above a C average.

10. The mean grade-point averages of both groups climbed slightly but steadily each year through the fourth year. While by the end of the fifth year the grade-point average of the REG students had dropped from 2.78 to 2.64, that of the ARC students continued to rise from 2.28 in the fourth year to 2.31 in the fifth year.

11. The increase in mean grade-point averages appears to be an indication of real improvement in the performance of the persisting students rather than the result of the dropout of students who had lower abilities. A further investigation of the significant differences between the dropouts and persisters in each group appears to indicate that; (a) there were no significant differences between REG persisters and dropouts in terms of entrance measures of academic ability; and, (b) the ARC persisters at the end of the first semester and first year had significantly higher high school ranks than did the dropouts, however, the loss of lower ranking students had no positive effect on ARC CGPAs.

12. A significantly larger proportion of ARC students than REG students were placed on academic probation or suspension during the five-year period covered by this study, which difference is significant at the .001 level; 25 per cent of the REG students and 49 per cent of the ARC students had been on academic probation or suspension.

Progress toward Graduation

13. There is no significant difference between the two groups in the proportion who persisted through both the first semester and the first year.

14. Although the proportion of REG students who persisted into their second year (60.6 per cent) is higher

than that for ARC students (52.3 per cent), it is not highly significant at the .01 level. This difference is significant at the .05 level. There is no significant difference between the two groups in the proportion who persisted into the third year (REG = 45 per cent; ARC = 39 per cent). The proportion of REG students (41 per cent) who persisted into the fourth year is higher than that of the ARC group (32 per cent), which is not highly significant at the .01 level. This difference is significant at the .05 level. For the fifth year, there is no significant difference in the proportions of REG and ARC students who persisted.

15. In each year except the fifth, the REG students accumulated significantly (at the .001 level) larger numbers of semester-hour credits than the ARC students. By the end of the fifth year, as more students approached graduation, there was no significant difference in the number of semester hours accumulated by REG and ARC students.

16. The REG students who graduated at the end of four years had accumulated 119.1 mean semester credit hours at North Texas State University, and ARC graduates had accumulated 116.5 mean semester credit hours. Since this study gathered data only on credit hours accumulated at North Texas State University, and since the standard deviations of both groups (REG = 13.9; ARC = 8.1) indicate that some students in both groups would have been required to

accumulate a greater number of semester credit hours to graduate than the data indicate, apparently some students took coursework at other institutions.

17. The REG students who graduated at the end of the fifth year had accumulated 122.6 mean semester credit hours while the ARC graduates had accumulated 121.5 mean semester hours; these means are closer to the number of semester hours required for degrees at North Texas State University.

18. Of the 81 REG students who were pursuing a degree into the fifth year, only 33 graduated; of the 73 ARC students who were pursuing a degree into their fifth year, only 26 graduated. Twenty-five per cent of REG and 13 per cent of the ARC students graduated by the end of the fifth year; this difference is significant at the .01 level.

19. Of the 86 REG students who graduated, 53 (62 per cent) did so at the end of the fourth year; of the 40 ARC students who graduated, only 14 (35 per cent) did so at the end of the fourth year.

Characteristics of Graduates

20. Among REG students, Caucasians (26.2 per cent) graduated at a higher rate than the groups' combined minorities (15.4 per cent).

21. Among ARC students, blacks attained the highest graduation rate (16.9 per cent), which is higher than the combined rate for all ARC students (12.9 per cent) and

higher than the ARC rate for Caucasians (11.8 per cent). ARC minorities (16.4 per cent) graduated at a higher rate than did REG minorities (15.4 per cent); although 70 per cent of all ARC graduates were Caucasian, 76 per cent of the entering ARC students were Caucasian.

22. Among all graduates, only one student in each group was married; the graduation rate for married students is only 5 per cent in both groups.

23. Females in both groups graduated at a higher rate than did males (REG females = 26.7 per cent; REG males = 22.1 per cent; ARC females = 16.1 per cent; ARC males = 8.8 per cent).

24. The mean entering age of the REG graduates was 18.4 while that of ARC graduates was 18.9. Fewer ARC graduates than REG graduates were 18 or under upon entering the university, and a slightly larger percentage of ARC graduates were between the ages of 19 to 22 upon entering the university; fewer ARC than REG graduates were older than 22 years of age upon entering the university.

25. The 32 REG students who graduated from the College of Business represent 41 per cent of those who entered this college; this is the highest graduation rate for any college or school for either group, and it is much higher than the 10.5 per cent graduation rate for ARC College of Business majors.

26. The 35 REG students who graduated from the College of Arts and Sciences represent only 18 per cent of those who entered this college; this is the lowest graduation rate for any college or school among REG students, but it is much higher than the ARC graduation rate among Arts and Sciences majors (9.8 per cent).

27. The School of Music is the only other college or school that had a below-average graduation rate among REG students; of the 48 students who enrolled in the School of Music only 20.8 per cent graduated. Of the 12 ARC students who entered the School of Music, only 1 graduated (8.3 per cent).

28. The College of Education had the second highest graduation rate for both groups; of the 21 REG students who entered the College of Education, 8 graduated (33 per cent); of the 38 ARC students who entered the College of Education, 10 graduated (26.3 per cent).

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CHAPTER V

SUMMARY, DISCUSSION OF DATA FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study is concerned with the problem of measuring, describing, and analyzing the academic performance and progress toward graduation over a five-year period (1977-1983) of students who entered a large public university through an admissions review committee process for presumptive-deny students (ARC students). The purpose of this study is to compare the academic performance of ARC students with that of selected students who entered through the regular admission process to determine if the review committee members were as effective in selecting students for admissions as were the objective data used in the regular admission process. The admission review committee process is judged effective if the students admitted by the committee perform as well and made as much progress toward graduation as did the students admitted on the basis of objective data (college entrance scores and high school rank in class).

Population of the Study

The study population is composed of students who began their academic careers at North Texas State University in

the Fall Semesters of either 1977 or 1978. In order to insure enough students for meaningful calculations in the later years of the study, it was necessary to combine these two entering classes. Students who had transfer hours or who were not United States citizens were eliminated from the study groups. Of the 660 students in the study, 350 were classified as REG students and 310 were ARC students. The 350 REG students were selected randomly from 2,972 students who met the regular engrance requirements for the study. The subjects of the study range in age from 16 to 59 years old, are both male and female, are generally from three major ethnic groups, and are majors in five university schools or colleges.

The academic histories of the subjects were accumulated on magnetic tape from records in the computing center of the university. The Statistical Analysis System (SAS) was used to manage the files and execute the calculations for the study. Demographic data (sex, marital status, race, age, and college major) were analyzed and subsequently presented for each study group.

Statistical Procedures

The measures of academic performance are grade-point average and the occurrences of academic probation and suspension. Progress toward graduation is measured by cumulative semester hours earned, persistence, and

graduation rates. Calculations were made for each year of the study period to determine mean grade-point averages for both groups, mean cumulative semester hours completed by both groups, persistence rates for both groups, and graduation rates for both groups by the end of both the fourth and fifth years. For graduates in each group the variables examined are sex, age, marital status, race, and college major.

The hypotheses presented in Chapter I were tested using Fishers' t test or a chi-square test to determine if there were any significant differences between the two groups in mean grade-point average, mean cumulative semester hours earned, proportion of students on academic probation or suspension, and the proportion of students who persisted in each year of the study. Additionally, the null hypotheses were tested to determine any significant difference between the REG and ARC student groups for the proportion of each group that graduated by the end of the four-year and five-year periods.

Summary of Major Data Findings

The major data findings are presented according to four classifications. These classifications are (a) student characteristics upon college entry, (b) academic performance, (c) progress toward graduation, and (d) characteristics of graduates.

Student characteristics upon college entry.--The ARC group has a higher ratio of females to males than does the REG group (ARC = 56 per cent; REG = 53 per cent); 54 per cent of the total freshman class are females. On college entrance examination scores and high school rank in class, the REG students' scores are at least one standard deviation higher than those of the ARC students; although the ARC student group has a higher percentage of minority students, particularly blacks (ARC = 21 per cent; REG = 11 per cent), the majority (84.9 per cent) of the freshman class is Caucasian; only 12 per cent of the freshman class are married; the mean age of both groups is identical at 19.5 years; although the College of Arts and Sciences enrolled over 50 per cent of each study group, ARC students were nearly twice as likely to enroll in the College of Education.

Academic performance.--At the .001 level of statistical significance, the mean grade-point averages of REG students are higher than those of ARC students for each of the five-year segments of the study; over the five-year period, the mean grade-point average of REG students did not drop below a C average, while the ARC students attained and maintained a C average only by the end of the second year; since there are no significant differences between the groups of persisters and dropouts in terms of entrance measures of academic ability, the increase in mean grade-point averages

appears to be an indication of real improvement in the performance of persisting students; at the .001 level of statistical significance, a larger proportion of ARC students were on academic probation or suspension during the five-year period of this study (ARC = 49 per cent; REG = 25 per cent).

Progress toward graduation.--Although there is no significant difference between the ARC and REG groups in the proportion that persisted through the first year of the study, a significantly larger percentage of REG students persisted into the second year; the greatest percentage of attrition for both student groups took place between the first and second years of the five-year period; only 61 per cent of the REG students and 52 per cent of the ARC students persisted into the second year; 45 per cent of the REG students and 39 per cent of the ARC students persisted into the third year; 41 per cent of the REG students and 32 per cent of the ARC students persisted into the fourth year; only in the second and fourth years are the persistence rate for the two groups significantly different at the .001 level.

Although the REG students accumulated significantly more semester hours credit than the ARC students in each of the first four years of the five-year-period, the difference is not statistically significant at the end of the fifth year; of the 350 REG students and 310 ARC students in the

beginning freshman class, 86 (25 per cent) REG students and 40 (13 per cent) ARC students graduated by the end of the five-year period, which is a statistically significant difference at the .01 level.

Characteristics of graduates.--Among REG students, Caucasians (26.2 per cent) graduated at a higher rate than the REG group's combined minorities (15.4 per cent); although 91 per cent of all REG graduates are Caucasian, only 85 per cent of the 350 entering REG students are Caucasian. Among the ARC students, blacks (16.9 per cent) graduated at a higher rate than both the combined rate for all entering 310 ARC students (12.9 per cent) and for ARC Caucasians (11.8 per cent); although 70 per cent of all ARC graduates are Caucasian, 76 per cent of the 310 entering ARC students are Caucasian; the graduation rates for ARC blacks (16.9 per cent) and ARC Mexican-Americans (12.5 per cent) are higher than those for REG blacks (15.4 per cent) and REG Mexican-Americans (8.3 per cent).

Females graduated from both groups at a higher rate than did males; ARC females graduated at nearly twice the rate of ARC males. There is little difference in the mean entering age between REG and ARC graduates; the mean entering age was 18.4 for REG graduates and 18.9 for ARC graduates.

Of the 78 REG students who entered the College of Business, 31 (41 per cent) graduated from that college; this

is the highest graduation rate for any college or school for either group, and it is much higher than the 24.6 per cent total REG graduation rate regardless of major. Of the total ARC graduates (40), 68 per cent graduated from the College of Arts and Sciences and Education, although the graduation rate for the College of Arts and Sciences (9.8 per cent) is the second lowest for the entering ARC student group.

Discussion of Data Findings

The discussion of data findings is presented according to four classifications. These classifications are (a) student characteristics upon college entry, (b) academic performance, (c) progress toward graduation, and (d) graduation data. Wherever possible, the findings of this study are related to the literature on the entering class of 1978, which was the last entering year for the groups in this study.

Student Characteristics upon College Entry

It was reported by the National Center for Education Statistics (NCES; 12, p. 2), that 48 per cent of the 1978 first-time entering freshman class were females. This national average is below the percentage of females in the study groups (ARC = 56 per cent; REG = 53 per cent; all students = 54 per cent). The national averages for the entering class of 1978 as reported by Astin (1, p. 14),

indicate that 88.5 per cent were Caucasian; 8.1 per cent were black; and 1 per cent were Mexican American; however, the entering class in this study has a slightly lower percentage of Caucasians (84.9 per cent), and a higher percentage of blacks (9.9 per cent) and Mexican-Americans (3.1 per cent). A larger percentage of the national freshman class of 1978 were single (National = 98.8 per cent; NTSU = 88 per cent; 1, p. 14).

The finding that the ARC students were at least one standard deviation below the REG students on college entrance examination scores and high school rank in class parallels the findings of McConkey (11, p. 39) for provisional students at the University of Texas at Austin (UTA). Cole, Bolding, and Johns (5, p. 30) report that provisional students at the University of Arkansas at Fayetteville (UA-F) entered with Cooperative English Expression Test scores and high school grade-point averages that were more than one standard deviation below those of regular students; and, Wilson (20, p. 11) reports that Special Studies Students at Southern Illinois University at Carbondale entered with ACT scores that are at the tenth percentile on national norm scales. It is clear from this and other studies that exceptions to admissions requirements are being made to accommodate students who have considerably lower entrance credentials than are presented by regularly admitted students.

The mean CGPA of REG students are significantly (.001) higher than those of ARC students for each segment of this five-year study; however, the observed differences are smaller than expected given the large difference between the two groups on college entrance measures. McConkey (11, p. 11) reports similar findings for the provisional students at UTA; however, Cole, Bolding, and Johns (5, p. 5) found that the provisional students at UA-F had CGPAs that were more than one standard deviation below those of regularly admitted students.

The ARC students attained and maintained a C average only by the end of the second year. This finding verfies those of Lacy (9, p. 23) for provisional students at Oklahoma State University; of McConkey (11, p. 57) for provisional students at UTA; and of Cole, Bolding, and Johns (5, p. 5) for provisional students at UA-F.

A significantly (.05) larger proportion of ARC than REG students were on academic probation or suspension during the five-year period of this study (ARC = 49 per cent; REG = 25 per cent). Cole, Bolding, and Johns (5, p. 5) reported similar differences in proportions for provisional and regular students at UA-F (provisional = 20 per cent; regular = 9 per cent) at the end of the first year.

There is strong indication in the literature and from the findings of this study that specially admitted students do not attain and maintain a C average until well into their

college education. Furthermore, higher proportions suffer more academic failures than regularly admitted students.

Progress toward Graduation

There is no significant difference between ARC and REG students in the proportion that persist through the first year (REG = 92.6 per cent; ARC = 90.3 per cent); these persistence rates are higher than the 85 per cent national rate reported by Ramist (16, p. 3), and considerably higher than persistence rates reported by McConkey (11, p. 51) in his study of provisional students at UTA (provisional = 47 per cent; regular = 68 per cent).

The greatest percentage of attrition for both groups took place between the first and second years of the study; only 61 per cent of REG and 52 per cent of ARC students enrolled for coursework during the second year. While the first year persistence rates are higher than the national average, the second year rates are lower than the national average according to data presented by Ramist (REG = 61 per cent; ARC = 52 per cent; national = 70 per cent; 16, p. 3); however, these rates are higher than the second year persistence rates reported by McConkey (11, p. 51) for provisional students at UTA (provisional = 32 per cent; regular = 45 per cent). A national average more appropriate to this study may be that reported by Peng and Fetters (14, p. 366) and Eckland and Henderson (7, p. 24). They report that the

National Longitudinal Study Class of 1972 had a 66 per cent two year persistence rate in four-year public colleges. Although the persistence rates of REG and ARC students are lower than national averages, they do compare more favorably with those of public four-year colleges (REG = 61 per cent; ARC = 52 per cent; four-year colleges = 66 per cent) than they do with general national averages (70 per cent).

A relevant finding regarding persistence is that once students pass the sophomore year, persistence rates do not decline as sharply as in earlier years; 45 per cent of REG students and 39 per cent of ARC students persisted into the third year; 41 per cent of the REG students and 32 per cent of the ARC students persisted into the fourth year. Both Ramist (16, p. 3) and Eckland (7) also found this to be true in their studies of student persistence.

The lower persistence rates for students in this study may be partially explained by the studies of Avakian, MacKinney, and Allen (2, p. 163) and Brown (4, p. 103), each of whom found that transfer students persist in higher proportions than do native students. It may be that persistence rates of the student groups in this study do not compare favorably with students in other studies because transfer students are not a part of this study.

REG students earned significantly (.001) more semester hours in each of the first four years than did ARC students.

McConkey (11, p. 57) reports that at the end of his study period (three semesters), regularly admitted students had earned significantly (.05) more semester hours than had provisional students; although tests of significance are not mentioned by Cole, Bolding, and Johns (5, p. 6), they do report that provisional students at UA-F earned a mean of 33.3 semester hours, while regularly admitted students earned a mean of 54.9 during the same time period. From the findings of this study and those reported by others, it appears that regularly admitted students typically earn more semester hour credits than do specially admitted students over the same period of time.

Graduation Data

Graduation rates.--Fifteen per cent of REG students graduated in four years; this four-year graduation rate (15 per cent) is less than half that reported in many studies, e.g., 40 per cent rate reported by Pantages and Creedom (13, p. 49); 35 to 40 per cent rate reported by Lenning, Beal, and and Sauer (10, p. 4) and Ramist (16, p. 2); 36 per cent rate reported by Eckland and Henderson (7, p. 31); and 36.5 per cent rate reported by Eckland (6, p. 418). However, in a study of the 1971 entering class at NTSU, Brown (4, p. 103) reports that only 11.2 per cent of the native students graduated in four years; Avakian, MacKinney, and Allen (2, p. 163) report that only 13 per cent of the native students

in the 1975 entering class at the University of Missouri at St. Louis graduated in four years; and Young (21, p. 280) reports that only 13 per cent of the 1963 entering class at the University of New Mexico graduated in four years.

By the end of the fifth year 25 per cent of the REG students had graduated; this five-year graduation rate (25 per cent) is also about one-half of that reported in many studies; e.g., a 50 to 65 per cent rate reported by Lenning, Beal, and Sauer (10, p. 4); a 45 to 60 per cent rate reported by Ramist (16, p. 2); and a 67 per cent rate reported by Sanford (17, p. 268).

As can be surmised from this discussion, graduation rates vary widely. From the comparisons of data, it appears that North Texas State University is among those institutions that has (or has had) very low graduation rates.

Characteristics of graduates.--Females graduated at higher rates than did males in both study groups of REG (females = 26.7 per cent; males = 22.1 per cent) and ARC (females = 16 per cent; males 8.8 per cent) students. This finding is not consistent with that of Brown (4, p. 103) for the 1971 entering class at NTSU. He reports that while 16.5 per cent of the native males graduated, only 0.24 per cent of the native females did; further, Avakian, MacKinney, and Allen (2, p. 163) found that males graduated in higher

proportions than females at the University of Missouri at St. Louis.

The fact that females in the 1977 and 1978 entering classes at NTSU graduated in higher proportions than did the females in the class of 1971 may indicate a trend toward higher graduation rates for females at NTSU. It should be noted, however, that the female graduation rates reported in this study are at the end of five years and those reported by Brown (4, p. 103) and Avakian, MacKinney, and Allen (2, p. 163) are at the end of four years. Although this study does not investigate the difference, it could be that females take longer than males to graduate.

The findings in the literature on graduation rates by race are mixed; it appears, however, that if ability is controlled for there is no difference in graduation rates by race (14, p. 366; 15, p. 30). While this study does not control for ability, differences were observed in graduation rates by race. Among REG students, Caucasians (26.2 per cent) graduated at a higher rate than the REG groups' combined minorities (15.4 per cent). This finding confirms the findings of Brown (4, p. 103) for the 1971 entering class at NTSU. He reports that 12.8 per cent of Caucasians graduated in four years while no minorities did so. Although these data are not available for investigation, the fact that Brown found no minorities graduating in four years, and this study found 15.4 per cent graduating in five years, could

indicate that minorities take longer than Caucasians to graduate.

An encouraging finding is that ARC minorities graduate in higher proportions than expected when compared to the graduation rates for REG minorities; this is true for both blacks (ARC = 16.9 per cent; REG = 15.4 per cent) and Mexican-Americans (ARC = 12.5 per cent; REG = 8.3 per cent). Additionally, ARC blacks and Mexican-Americans graduate in higher proportions than do ARC Caucasians (11.8).

Not only are the findings regarding ARC minorities unexpected, it is also difficult to interpret their implications. It may be that only the highly motivated minority students survive the rigorous Admissions Review Committee process while minority students who meet the regular admission requirements have relatively low motivation.

There is little difference in the mean entering age of REG and ARC graduates (REG = 18.4; ARC = 18.9); over 98 per cent of REG and 92 per cent of ARC students were either 18 or 19 years of age upon entry into the university. This finding confirms that of Brown (4, p. 103) who reports that for the 1975 graduating class at NTSU, 152 out of the 153 graduates were 18 years of age or younger upon entry into the university; too, this finding seems to confirm Sexton's finding, after reviewing twenty-five years of research, that "Students who enroll at the normal age plus or minus a year,

had a better chance of persisting than students who were two or more years off the median age of entering students (18, p. 315).

Generally, the findings of this study indicate that subjective judgments are not as effective as objective data as a basis for decisions to admit presumptive-deny applicants to one large public university. As discussed in Chapter III, an important element in the admissions process for presumptive-deny students at North Texas State University is an interview with an admissions officer. Breland (3, p. 40), Frederiksen (8, p. 104), and Willingham and Breland (20, pp. 38-39) all found that interviews are not effective predictors of academic outcomes, and this may partially explain why the college performance of presumptive-deny students is not as good as that of students who were selected by the use of objective data.

Conclusions

The following conclusions are based on the analyses and interpretation of data gathered in this study.

1. The subjective judgments of the Admissions Review Committee at North Texas State University are not as effective in selecting students who can perform equally with the students who are selected based on objective data.

2. The students admitted by the Admissions Review Committee are generally not well prepared for college-level work.

3. The established admissions requirements (college entrance examination scores and high school rank in class) appear to be good performance measures for identifying students who can earn at least a C average in their first year.

4. Although the subjective judgments of the Admissions Review Committee were not as effective in selecting students who can perform as well as students selected by objective data, the committee decisions appear to serve the function of meeting important social goals by admitting larger numbers of minority students.

5. Minority students who are admitted through the Admissions Review Committee appear to be better able to meet the challenge of the college experience than are Caucasians who are admitted through the same process.

6. The Admissions Review Committee process seems to be effective in identifying highly motivated minority students who then graduate in higher proportions than the Caucasians who are admitted through the same process.

7. Students who enter North Texas State University directly from high school are more likely than older students to graduate from NTSU.

8. Though the overall results are statistically disappointing, the Admissions Review Committee does admit many students who perform well and graduate; such students would have been denied even the chance to try for a college degree at NTSU under the regular admissions requirements.

Recommendations

The following recommendations pertain to the enhancement of the educational opportunities and college experiences of both REG and ARC students at North Texas State University and are made on the basis of the findings of this study.

1. It is recommended that the Admissions Review Committee be continued with modifications that include the following:

(a) A study should be conducted to determine what support services are needed by the ARC students, and appropriate services should be implemented to meet these needs.

(b) All students who are admitted through the Admissions Review Committee should be required to obtain academic support services at least through the first year. A system to monitor this requirement should be established in cooperation with the supplier of these services on campus and the registrar's office.

(c) The Admissions Review Committee should seek additional objective evidence from male presumptive-deny students that would support their admission to the university. This supporting evidence could include further testing.

(d) The Academic Affairs Committee should take a more serious approach to the Admissions Review Commiteee process. At the present time, faculty members are not assigned to service for any specific period, which destroys the continuity of faculty representation on the committee. Because the admissions staff may feel pressure to keep enrollments up, the committee needs the balance of committed faculty members who will search for the more qualified from among the presumptive-deny group. The Academic Affairs Committee should appoint two faculty members to serve for staggered terms the first year--one serving for two years, the other for one year. Thereafter, each term should be for two years, which will add continuity to faculty representation on the committee.

(e) Some changes should be made in the number of admissions staff who can vote in the committee; presently, all staff members vote, and they outnumber the faculty representatives. It is recommended that only three admissions staff members be allowed to vote in any one session, and that a four-fifths majority be required for admission of a presumptive-deny student.

(f) Non-voting status should be held by the admissions staff member who has interviewed the presumptive-deny student whose case is before the committee; it is possible for the judgment of the interviewer to be clouded or biased as a result of the interview and such impressions may have

nothing to do with the applicants' ability to succeed in the classroom.

2. A committee that has direct access to the President should be appointed to assess the attrition problem among all entering first-time freshmen; this committee should develop an early warning system to identify students who are drop-out prone, and along with that, strong programs to facilitate retention.

3. Special programs for older-than-average students should be developed to encourage their persistence to graduation.

4. Good working relationships should be continued and maintained with local community colleges to facilitate the movement of NTSU students into and out of these institutions.

5. This study should be replicated to include transfer and foreign students.

6. Statisticians who are interested in tracking student academic progress should devise a more accurate statistical procedure than is presently used for comparing student progress over time. A statistical procedure that can accommodate (or at least account for) movement into and out of a cohort group would enhance researchers' abilities to quantify significant differences between students performance over time.

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APPENDIX

TABLE XXIV

TABLE FOR DETERMINING SAMPLE SIZE FOR A GIVEN POPULATION

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	21	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

N = population size, S = sample size.

Source: Robert V. Krejcie and Daryl W. Morgan, "Determining Somple Size for Research Activities," Educational and Psychological Measurement, XL, Winter, 1980.

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