

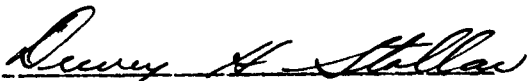
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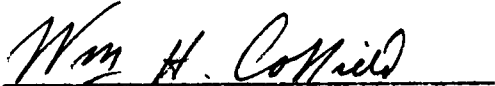
I am submitting herewith a dissertation written by Kenneth L. Stoner entitled "A Five Year Analysis of Factors Affecting the Retention of In-State Freshmen Admitted to The University of Tennessee From Fall Quarter of 1968 Through Summer Quarter of 1973." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Educational Administration and Supervision.



C. Kenneth Tanner, Major Professor

We have read this dissertation
and recommend its acceptance:







Accepted for the Council:



Vice Chancellor
Graduate Studies and Research

Thesis

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A FIVE YEAR ANALYSIS OF FACTORS AFFECTING THE RETENTION OF IN-STATE
FRESHMEN ADMITTED TO THE UNIVERSITY OF TENNESSEE FROM FALL
QUARTER OF 1968 THROUGH SUMMER QUARTER OF 1973

A Dissertation
Presented for the
Doctor of Education
Degree
The University of Tennessee, Knoxville

Kenneth L. Stoner

August 1979

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ABSTRACT

The purpose of this study was to provide administrators, faculty, and staff at The University of Tennessee, Knoxville with information concerning the retention of in-state freshmen. Specific attention was focused on the analysis of the data concerning the retention of marginally qualified in-state freshmen. This study was designed to provide the historical information necessary to make future decisions on the value of and need for special assistance programming for students considered only marginally qualified for admissions.

It was necessary to use a variety of computer procedures to generate a master tape containing the information needed in this analysis. Basically, the computer information available on every in-state freshmen admitted from Fall Quarter of 1968 through Summer Quarter of 1973 with a composite American College Test (ACT) score as part of their individual record was selected for analysis. Every individual identified on the file tape was "tracked" for a minimum of five full years or twenty consecutive academic quarters. It could thus be determined if a student entering in Summer Quarter of 1973 graduated within five full years or by the end of Spring Quarter 1978.

A cumulative five-year record was generated on every individual identified for analysis. The individual information available for analysis consisted of student identification number, quarter and year of enrollment, composite ACT score, high school cumulative grade point average, home county, sex, marital status, race, date of birth, college of initial enrollment, university graduation date, cumulative college

grade point average, and enrollment status for 20 consecutive quarters.

The resulting computer file tape consisted of individual information of 17,305 in-state freshmen from this five-year period. The sample selected through the process described was considered more than sufficient not only for making inferences about the total group or entire population of individuals originally admitted as in-state freshmen during this five-year period but also for conceptualizing the probable persistence patterns of in-state freshmen who have subsequently been admitted.

The data were analyzed descriptively by the computer providing frequency and percentage of individuals in each of the eight biographic or demographic categories: race, sex, marital status, composite ACT score, high school cumulative grade point average, county wealth, enrolled college and age. In addition, the descriptive analysis was further supplemented by comparatively graphing the persistence patterns for 20 consecutive quarters of the students in these same categories. Stepwise discriminant analysis was utilized as a classification technique for predicting the probability of graduation.

Six research questions were employed to design the analysis of the data and to present the findings.

1. The study found that 38.8 percent of all in-state freshmen admitted from Fall Quarter of 1968 through Summer Quarter of 1973 graduated within 20 consecutive quarters from their respective dates of admissions.

2. The research determined that of all individuals admitted during these five years as in-state freshmen, 97.3 percent were under 21 years of age, 91.2 percent were not married, 91.4 percent were white

84.5 percent had a high school grade point average of 2.25 or higher, 89.5 percent had a composite ACT score greater than 16, and 55.8 percent were males while the remaining 44.2 percent were females.

The research determined the comparative composition of those graduated within 20 consecutive quarters and found that 98.1 percent were under 21 years of age at their respective dates of admissions, 89.6 percent were not married when admitted, 95.4 percent were white, 92.9 percent had a 2.25 or higher high school grade point average at date of admissions, 95.7 percent had better than a 16 composite ACT score, and 53.7 percent were males while the remaining 46.3 percent were females. When the percentages of those graduated within 20 consecutive quarters were compared with percentages admitted, negligible differences were found by county wealth and college enrollment variables.

Of all individuals admitted with a composite ACT score of 16 or less, only 19.5 percent persisted to graduation. Also, of all individuals admitted with both a composite ACT score of 16 or less and a high school grade point average of less than a 2.25, only 9.2 percent persisted to graduation within 20 consecutive quarters.

3. The research determined that the greatest attrition of the students admitted as in-state freshmen occurred during the first academic year. The largest portion of the students were graduated on schedule, four academic years or 15 academic quarters from their respective dates of admissions.

4. Concerning persistence and graduation patterns, females tended to be graduated earlier or exactly on schedule proportionately more frequently than did males.

Individuals originally enrolled in the College of Liberal Arts and the College of Education tended to graduate on schedule more frequently than students in other colleges. Students originally enrolled in the College of Business took relatively longer to graduate than students originally enrolled in any other college. Virtually no students graduated ahead of schedule in the College of Engineering; a few were graduated during the fourth academic year, but most individuals graduated exactly on schedule at the end of the fifth academic year in accordance with that college's five-year programs.

The rather homogenous composition of the in-state freshmen complicated the comparison of persistence and graduation patterns on the basis of age, marital status, county wealth, high school grade point average, composite ACT score, and race.

5. The research determined that composite ACT score and high school grade point average were both positively and significantly related to graduation while the county wealth variable did not significantly improve graduation predictions. High school grade point average proved to be the single best predictor of graduation from The University of Tennessee, Knoxville; however, composite ACT score did add significantly to the graduation prediction. Utilizing only these two variables, it was possible to correctly classify on an individual basis 63.4 percent of all in-state freshmen as future graduates or non-graduates at their respective dates of admissions.

6. The research determined that 56.0 percent of those students not graduated within five years had better than a 2.00 cumulative grade point average at the time they left The University of Tennessee, Knoxville.

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CHAPTER I

INTRODUCTION

Several authors have recently questioned the current value of "a higher education" to both the individual and society in general (Bird, 1975; Bird and Boyer, 1975; Freeman and Holloman, 1975; Goodman, 1962; Lenning, 1974; Magarrell, 1975; Tharp, 1975). Bowen (1977) opposed references such as these, documenting the permanence of effects resulting from attending college on individuals and in turn the benefits accruing to society. Further, and perhaps the most significant contribution of higher education in the future will be to help individuals maximize their potential, to enrich the culture, and to make equality of opportunity a reality (Vermilye, 1975). These two rather global perspectives of Bowen and Vermilye can and must be implemented on an institutional level for all categories of clientele served by individual institutions of higher education. In addition, current knowledge pertaining to each individual's chance of academic success must be translated in an understandable manner to each individual seeking admission to any of these institutions.

For example, it is known that there are several important predictors of academic success in college. The four most often used predictors of post-secondary academic success are high school grade point average, rank in high school class, college admission test score, and academic rating of the high school. Of course, there are numerous other biographic and demographic factors that greatly assist in the prediction of any individual's chances of success (Astin, 1975). In

fact, Astin provided a specific prediction equation complete with worksheets for calculating or predicting each individual's chance in 100 of not completing a baccalaureate degree (Astin, 1975). This particular prediction formula for drop out proneness is based on the Scholastic Aptitude Test (SAT), although conversion tables are available for adapting this formula for utilization by institutions requiring other national admissions tests such as the American College Test (ACT) and the National Merit Scholarship Qualifying Test (NMSQT) (Astin, 1971). At The University of Tennessee, Knoxville the American College Test (ACT) is utilized; this admissions test has many of the same built-in predicting features. Understandability and capability of computing success probability on an individual basis is an asset not only to the institution, but also to the prospective student. Institutional administrators and educators obviously need to know the background and capabilities of their clientele; however high school graduates also need to know the institutions where they will have little probability of success (Astin, 1975; Hodges, 1976).

Some authors have specifically emphasized that retention begins with an ethically conducted recruitment program. The following selection from Anderson (1978) is one example:

Recruitment practices and admissions decisions must reflect the highest moral and ethical standards. Too often, equal opportunity programs have provided little more than the opportunity for nontraditional students to become discouraged, to experience yet another failure, and to drop out or be dropped out with ruined dreams and expectations. Recruiters have a moral obligation to tell students as candidly as possible the likelihood of their being admitted, obtaining financial aid, finding housing, and being victimized by discrimination. Recruiters also have an obligation to describe what students can expect from the program and what they will

experience in class. They should also indicate their likelihood of succeeding academically and their probability of graduating from the institution (p. 38).

Concern for retention is certainly not new; however, in the last five years the number of institutions beginning to take this relationship with students seriously has dramatically increased. This institutional concern is directly related to the perceived impact of the pending enrollment decline on the fiscal stability of the institution (Astin, 1977).

Enrollment fluctuations have a proportionately greater impact on smaller institutions; many such institutions have already begun programmatic modifications designed to improve the accuracy of academic success predictions, to retain students longer, and to implement special programming for those students that may be considered marginal.

In the last few years, post-secondary education has begun to be considered a fundamental right of the individual. Such an egalitarian notion is having a tremendous impact on all institutions of higher education. Students previously considered to be only marginally qualified are attending institutions of higher education in greater and greater numbers. Many colleges and universities have recognized their unique needs and are providing special assistance programs for these students similar in concept to those programs developed for ethnic minorities, blacks, women, "life-long learners," and the physically handicapped. The dilemma at The University of Tennessee, Knoxville is difficult to resolve. On the one hand, the University desires to admit any approved Tennessee high school graduate requesting admission even though a substantial number of these students are considered to be only marginally

qualified; on the other hand the Tennessee Higher Education Commission (THEC) staff members have indicated that special assistance programs for such students should not be one of the primary focuses of this institution. The difficulty of this dilemma is further compounded by the fact that many students from Appalachia as well as many black students in this area are not served by any other comprehensive public higher education institution. In addition, these same students are often categorized as only marginally qualified for admissions to The University of Tennessee, Knoxville (Aldmon, 1977).

The predicted enrollment decline is now affecting The University of Tennessee, Knoxville and increased emphasis and greater attention will be given to the retention of students. A review of past retention studies completed at The University of Tennessee, Knoxville revealed one published by the Office of Institutional Research which assessed the retention of students admitted through the "conditional admissions" program. Although 21 of the 67 students in this study were still enrolled two and one-half years later, only nine possessed a cumulative grade point average greater than 2.00 at that time (Larsen, 1974). This follow-up study of marginally qualified students was certainly a step in the right direction; however, it would have been helpful to know if any of these students ever graduated from this institution.

I. STATEMENT OF THE PROBLEM

The University of Tennessee, Knoxville has established a number of task forces and committees to determine means of increasing the retention of students through graduation without compromising the

quality of education. The committees were appointed in response to the enrollment decline which has been adversely affecting the financial status of The University of Tennessee, Knoxville in that institutional income is directly proportional to enrollment. The problem is that the effectiveness and impact of these committees and the programs subsequently developed may be limited without adequate historical information of the attrition and graduation rates of the various categories of students being served by The University of Tennessee, Knoxville.

II. RESEARCH QUESTIONS

1. Of the in-state freshmen enrolled at The University of Tennessee, Knoxville from Fall Quarter, 1968 through Summer Quarter, 1973, what percent graduated from The University of Tennessee, Knoxville within 20 consecutive quarters from their respective dates of admissions?

2. Classifying these same students at time of enrollment by race, sex, marital status, composite ACT score, high school cumulative grade point average, county wealth, enrolled college or age, what were the percentages of students enrolled in each category in comparison with the percentages of students graduated in each category within 20 consecutive quarters from their respective dates of enrollment?

3. What was the pattern of persistence and the pattern of graduation in academic quarters as determined by the numbers in attendance each subsequent quarter for 20 consecutive quarters?

4. Did the pattern of persistence or the pattern of graduation in academic quarters of these students differ when graphically compared on the basis of race, sex, marital status, composite ACT score, high

school cumulative grade point average, county wealth, enrolled college or age?

5. At date of enrollment, could the combination of composite ACT score, high school cumulative grade point average, and county wealth have accurately predicted persistence through graduation on an individual basis?

6. Of the in-state freshmen enrolled but not graduated within 20 consecutive quarters, what percent had a 2.00 or higher cumulative grade point average at the end of their last quarter in attendance?

III. STATEMENT OF PURPOSE

The purposes of this study were: to provide administrators, faculty, and staff at The University of Tennessee, Knoxville with information concerning the retention and attrition rates and the persistence and graduation patterns of all in-state freshmen; to focus attention on the retention rate of marginally qualified in-state freshmen; to make recommendations which may assist in the development, implementation and maintenance of retention programs; and to identify areas in need of additional or more specific research.

IV. IMPORTANCE OF THE STUDY

In the proceedings of a conference sponsored by The University of Tennessee, Knoxville, the participants recommended that each institution initiate "census studies" of college graduation and attrition rates which would provide base information on the numbers and characteristics of students included in various categories. The participants concluded

that such base information established guidelines on which to evaluate institutional policies and procedures and also provided an opportunity for each institution to put its own house in order (Proceedings of the Research Conference on College Dropouts, 1964). To date, a census study of graduation and attrition rates has not been conducted at The University of Tennessee, Knoxville.

This study will provide the base information required for evaluating current and future retention programs. The rate of persistence of the marginally qualified students will also be determined in addition to the rate of persistence of all students; such information will be valuable for making assessments on a group and individual basis the comparative possibility of graduating from The University of Tennessee, Knoxville.

V. DEFINITION OF TERMS

1. The composite ACT score is defined as that one total assigned through the scoring of the academic abilities exam, referred to as the American College Test (ACT) taken by high school juniors and/or high school seniors as part of the admissions requirements of most institutions of higher education in the United States.

2. County wealth will be the relative comparison of the median family income of each individual county among the other counties in Tennessee.

3. The cumulative grade point average is specific to an individual student. The student's cumulative average is obtained by dividing the total number of quality points accumulated in all quarters by the total number of quarter hours attempted during those quarters, not

including hours for which grades of N, NC, NG, P, S, SI, and W* have been received.

4. Higher education is used to identify any part of post-secondary education that leads to the award of at least a baccalaureate degree.

5. An in-state freshman is a student who resided within the borders of Tennessee at the time of his or her application for admissions and who began attending The University of Tennessee, Knoxville for the first time or transferred to this same institution for the first time with less than 12 quarter hours of academic credit. In this study, the terminology of "in-state freshman" and "freshman" will be utilized interchangeably.

6. A marginally qualified student is considered to be any student admitted to The University of Tennessee, Knoxville with a composite ACT score of 16 or less at the time of his or her admission.

7. Post-secondary education is the array of educational opportunities available beyond the high school curriculum.

* It should be noted that some of these grade designations are no longer utilized. However, in the five year period under study, it would have been possible for an individual to receive several combinations of these grades on his or her transcript. These grades are briefly defined for reference purposes. "N" (no progress) indicates lack of progress on a course approved to extend beyond one quarter. "NC" (no credit) indicates failure to complete a course satisfactorily when taken on a S/NC basis. "NG" (no grade) indicates failure to complete a course satisfactorily. The grade of NG may be awarded to students who elect to take a course under a P/NG option. "P" (pass) designates a passing grade without further indication of performance level. "S" (satisfactory) is assigned for C or better work when a course is taken on a S/NC grading basis. "SI" (incomplete) is assigned in S/NC graded courses only. "W" (withdrawal) is assigned in courses from which a student has officially withdrawn.

8. At the completion of each course, a student is assigned a grade reflecting the student's performance in the course. Passing grades normally carry with them a certain number of quality points per quarter hour of credit in the course. Grades at The University of Tennessee, Knoxville are calculated on a 4.0 quality point scale. Undergraduate students are assigned grades on this quality point scale as follows:

<u>Grade</u>	<u>Performance Level</u>	<u>Quality Points Per Credit Hour of Credit</u>
A	Superior	4
B	Good	3
C	Average	2
D	Below Average	1
F	Failure	0

9. The basic unit of credit at The University of Tennessee, Knoxville is the quarter hour. This normally represents one hour of lecture or recitation or two hours of laboratory work per week. Each course at this institution carries the number of quarter hours credit specified in the course description.

10. A student's quarterly grade point average is obtained by dividing the total number of quality points accumulated by the total number of quarter hours attempted, not including hours for which grades of N, NC, NG, P, S, SI, and W have been received. The grade point average is quarterly average only and is calculated for each quarter of academic work attempted.

11. Undergraduate retention standards specify eligibility requirements for continuing at The University of Tennessee, Knoxville. An undergraduate student must maintain a cumulative grade point average at or above the minimum acceptable level shown on the next page:

<u>Total Quarter Hours Attempted</u>	<u>Minimum Acceptable Grade Point Average</u>
0 - 35.9	1.00
36 - 83.9	1.50
84 and Above	2.00

A student whose grade point average falls below the minimum acceptable level in any quarter will be placed on academic probation for the subsequent quarter of enrollment. During the probationary quarter the student must attain the minimum acceptable average shown above, or a 2.00 average for that quarter, or be dropped from the University.

CHAPTER II

REVIEW OF THE LITERATURE

I. BACKGROUND

One of the assumptions implicitly understood if not explicitly stated in the research is that decision makers including faculty, administrators, educational policy makers, and prospective students have a goal of eliminating institutional barriers that decrease the probability of graduation. It must be noted that administrators as well as faculty have traditionally turned to recruitment as a practical means for retaining needed enrollment levels. An equally promising approach is to reduce the drop out rate. In fact, in four year institutions, any change that deters students from dropping out can potentially affect three classes of students at once, whereas any change in recruiting practices can affect only one class in a given year (Astin, 1975).

Section one of this chapter provides a review of several thorough and significant national and institutional studies which have already been published on the topics of student attrition and retention. No attempt will be made to duplicate such reviews; however, these publications have provided an excellent point of departure.

The student classification variables stipulated in the research questions are generally referenced as academic considerations or as personal characteristics. Section two reviews the literature relating to academic considerations such as high school grade point average, academic ability test score, college grade point average and the impact of

faculty members. Section three focuses on the literature relating to biographic, demographic or personal characteristics such as sex, race, disadvantage, involvement, individual commitment and motivation, and median family income.

National Studies

Summerskill (1962) carefully reviewed almost 40 years of research on the topic of college student dropouts and college student attrition. He reported that institutional interest in attrition stems from three sources. First, there is a fundamental belief that colleges are organized as training centers rather than intellectual centers. Institutions of higher education are heavily utilized to funnel individuals into functional careers for society and consequently many educators and administrators are concerned about the attrition rate. Second, the nature and extent of any student losses constitute one measure of efficiency of any educational institution. Recent emphasis on management and accountability in institutions of higher education has drawn increased attention to this topic. And third, institutional income is almost always directly proportional to enrollment. Attrition represents not only a loss of human potential but also a loss of dollars (Summerskill, 1962).

One persistent fact noted by this same author is that some 40 percent of the college students graduate on schedule and approximately another 20 percent will graduate with a baccalaureate from some institution of higher education at a later date; these facts have remained consistent for several decades (Summerskill, 1962). Predictors indicate that during the 1980's the same percentages will be accurate: 40 percent will graduate in the traditional four years, 20 percent more will

obtain a baccalaureate at a later date, but 40 percent will never earn a degree (Cope, 1978).

Cope and Hannah (1975) also provided a review of the literature in their book entitled Revolving College Doors. This book provided a thought-provoking analysis on the causes and consequences of dropping out with particular emphasis on the loss of not only financial resources but also human potential. They wrote:

" But for many of those who drop out of higher education entirely and never earn degrees--the 40 or 50 percent of all freshmen--the cost is high. Leaving often involves a substantial cost to the student in lost earnings potential and immediate out-of-pocket expenses. As irrational as it may seem, two years of college does not increase lifetime earning capacity half as much as a four-year degree. In addition, many students who do not complete their intended degree programs also experience a psychological loss; they are dissatisfied in themselves and must face the dissatisfaction of family and friends.

The institution loses, too. First substantial sums of money are devoted to attracting students, particularly to liberal arts colleges. Then, there are investments of time and energy in teaching, counseling, record maintenance, housing, and other forms of effort to accommodate student growth. There are also scholarships, loans, work-study programs--everything involving monetary cost. The graduate becomes a credit, an alumnus, or alumna, a representative. The nongraduate erodes institutional capacity and credibility (p. 6).

A review of the studies on college attrition from 1950 through 1975 has also been provided by Pantages and Creedon (1978). They emphasized precise operational definitions and the need for longitudinal research. It was noted that only 37 percent of the students graduated in the traditional four years while 50 percent of the students graduated after varying periods of continuous enrollment and that overall up to 70 percent eventually graduated from some higher educational institution. Thus, approximately 50 percent of those who graduate take longer

than the traditional four years. These authors suggested longitudinal designs of ten years.

Summerskill (1962) found a substantial relationship between attrition and first semester college grades in the 35 studies he specifically examined. The results of the review by Pantages and Creedon (1978) confirmed this relationship. These data support the interpretation that good grades maintain and strengthen academic performance and decrease the chances of dropping out. Conversely, initially unsuccessful students obtaining poor grades often develop a "failure identity" which increases the odds of dropping out. Cross (1974) also stressed the importance of the initial term in college to the point of recommending "guaranteed success" programs.

In a report by Cope and Hannah (1975) it was shown that the greatest attrition in public four year institutions occurred during the first two years and that the greatest proportion of withdrawals were among the academically less talented. They compiled the average cumulative attrition on the freshmen classes at 28 public colleges and universities. The results revealed that 10 percent of the freshmen had left by the beginning of the second semester and that by the beginning of the third year, 40 percent of the students had withdrawn. And, at the end of four years, over half of the students had withdrawn.

These authors suggested two relatively easy ways to determine the extent of attrition for any campus. Determination of attrition usually is the beginning point of analysis which in turn identifies areas of policy concern and areas for further research. They wrote:

For a rough check on the proportion of students not continuing for a degree, two easy and quick calculations are available. First, compare the number in the graduating classes with the number of

incoming freshmen. The implications were thought-provoking when a community college in the northwest compared the numbers of incoming freshmen (2884, 3102, and 2809 for the years 1969, 1970, and 1971, respectively) with the numbers of graduates (371, 476, and 579) two years later. Second, take a simple list with 100 incoming freshmen names and compare their names among the graduates in later years (p. 5).

A report issued by the Office of Education (Iffert, 1957) titled Retention and Withdrawal of College Students was based upon a sampling of approximately 13,700 men and women who enrolled in institutions of higher learning in the fall of 1950. This report indicated that college dropouts represented an alarming waste of our most competent manpower. Further, it was reported that although withdrawals cannot be completely eliminated, they can be sharply reduced and the result would be a larger professional work force and a higher cultural and intellectual level of citizenry contributing to the advancement of society.

This report similarly emphasized the importance of the first year. The report stated:

The first year of college is the most critical drop out period. This study found that 273 per 1,000 left school within the first year in comparison with 283 per 1,000 during the next three years. After a student has passed the first-year hurdle, his chances of attaining a degree brighten considerably. Since 150 per 1,000 drop out during the second year, we might say that when a student has reached the rank of a junior, he is a good graduation risk--about 685 chances per 1,000 (p. 100).

The researchers of a project sponsored by the U.S. National Center for Educational Statistics (1977) tracked 10,000 members of the 1972 high school graduating class for two and one-half years at 1800 diverse institutions of post-secondary education. Individuals withdrawing from institutions were classified according to reason for withdrawing, academic and nonacademic, and these data were analyzed

for biographic or demographic differences. Not surprisingly, this study concluded that socioeconomic status was associated with attrition and that financial aid programs would be helpful to many students. And further, this report indicated that withdrawal was largely a "motivational problem" and "a couple of years at work to develop responsibility and direction" was often necessary (p. 113).

Astin (1975) reported the results of a nationwide survey and follow-up survey four years later of 41,000 undergraduates at 358 representative two-year colleges and four-year colleges and universities. Astin provided information on student characteristics at the time of enrollment which predicted attrition and reviewed the impact of institutional policies on student retention and attrition. In a subsequent study, Astin (1977) synthesized and presented longitudinal data from over 200,000 students and 300 institutions. This research project represented the largest nationwide study of student development ever undertaken and persistence in an institution of higher education was accorded specific attention as one aspect directly affecting personal development.

Institutional Studies

The Pennsylvania State University initiated a retention program in the early 1950's. This program began by acquiring some base rate information about its own students such as grade distributions, aptitude test scores, and high school rankings for ten consecutive years. A steady flow of data and research concerning the admissions, academic performance, retention and graduation of students was generated. One basic assumption, a prerequisite to this study, was that institutional

organization such as curriculum, course content, academic calendar, and teaching methods were all situational factors which could be modified to increase a student's chances of success. In 1952, 31 percent of the entering freshmen dropped out during the first year while only 15 percent of the 1963 class dropped out during the first year. From 1952 through 1961, the drop out rate for the first three years declined from 51 percent to 27 percent.

During this period, the administrative and curriculum structures of The Pennsylvania State University were reorganized, a "term" academic calendar was introduced to replace the semester system, courses were subsequently reorganized, an extensive program of research on instructional procedures was developed, new instructional procedures were adopted by departments, admissions policies were modified and student personnel programs evolved. In addition, a new counseling program combining the preventive, remedial and educational traditions was implemented and began to function fully which also shared credit for retaining through graduation several thousand students who would not have graduated had this program not been in existence (Ford and Urban, 1966).

A study by Kowalski (1977) conducted at Indiana University should also be noted. Little specific or up-to-date campus information was available regarding a comparison of persisting and nonpersisting students at Indiana University. Thus, Kowalski examined the records through the Office of Admissions and Records of 250 persisting and 250 nonpersisting students in addition to analyzing the results of a questionnaire returned by each student. Kowalski made eight conclusions based on the analysis of data relative to persisting and nonpersisting

students. (1) It was unlikely that a student with academic disabilities and personal pressures would continue his or her education. (2) Students with academic and personal problems could be identified as potential dropouts. (3) Father's educational level was highly indicative of whether a student would persist or withdraw. (4) A positive personal relationship with a student's advisor and faculty members influenced a student's chances of remaining in school. (5) The needs of the students were not being adequately satisfied by the student personnel services. (6) A sufficient number of programs and courses were available to students at Indiana University. (7) Definite educational goals enhanced persistence in college. (8) Indiana University needed to continue to explore ways of not only keeping students in college until they completed their degrees, but also of giving them a useful and meaningful education (Kowalski, 1977).

In the summary of a study completed at Princeton, Pervin (1966) wrote:

What is clear, however, is that while the drop out rate is not changing, a higher proportion of students are now giving serious consideration to dropping out of college, at least temporarily. This may reflect greater acceptance of dropping out as opposed to viewing it as a failure, greater student unrest, or more familial and college support for a period of delay before completion of college and continuation on to the greater responsibilities of graduate school or business. Awareness of these changes over time may be helpful to us in determining the most significant stresses leading to dropping out of college (p. 59).

Results of a survey at North Texas State University indicated that students who dropped out reported dissatisfaction with programs and services provided by the Division of Student Affairs. It was concluded that more time and effort needed to be spent in planning for and working with the needs of students in the areas of academic

advising, counseling and guidance, student skills improvement, and financial aid (Novak, Naugher, and Rogers, 1978). Tweddale (1978a, 1978b; 1978c; 1979) developed reports on the retention of students at Grand Valley State College (GVSC) in Michigan. He reported that after three years, only 7.5 percent of the students still in school had completed three-fourths of the credits required for graduation (1978a). Students having completed three-fourths of the degree requirements at the end of three years were progressing as expected according to the traditional four-year graduation cycle which raised serious questions at GVSC of the appropriateness of the traditional four-year program completion expectations. In each of these reports, Tweddale continued to stress the importance of longitudinal data.

Bryan's (1977) study at Bloomsburg State College compared the academic achievement of traditional students admitted by a traditional process with the achievement of disadvantaged students admitted by a nontraditional procedure. It was concluded that disadvantaged students who persisted in college participated in special tutorial programs to a higher degree than the disadvantaged students who withdrew from college; but, the percentages of traditional students persisting was greater than either of the disadvantaged student groups (Bryan, 1977). Bryan's dissertation was useful; however, the students were not tracked through their respective graduations. Graduation percentages of each of these respective groups would have provided a meaningful basis for comparisons.

Pellegrom's (1977) dissertation was useful due to similarities in design to the present study. Pellegrom studied 47 students enrolled in a ten-week summer development program. These students were selected

because their composite ACT scores were below 16 and because each student was eligible for financial aid. Pellegrum concluded that a sense of isolation from either peer or university groups negatively affected marginal students' academic achievement. More importantly, however, she suggested that the study should be replicated using a larger population because size of the population studied was too small to make any substantial conclusions and that more information about marginal students needed to be developed particularly through long term follow-up projects and case studies (Pellegrum, 1977).

Several studies have been completed in the state of Tennessee. At Columbia State Community College the use of the National Assessment of Educational Progress (NAEP) supplemented the student achievement measures of the ACT (Tallon, 1978). Analysis of information obtained from the NAEP and the ACT was part of a study designed to increase the retention of students attending this community college.

At Volunteer State Community College (VSCC), a similar but more elaborate study was completed. At VSCC, the study utilized two instruments, from a package of five, published by the National Center of Higher Education Management Systems (NCHEMS). The timely administration of these five questionnaires was designed to provide clues to the retention of students. The two instruments administered at Volunteer State Community College were the Program-Completer Questionnaire and the Former-Student Questionnaire. Responses were compared between those who completed degrees and those who did not (Fry, 1978).

Tusculum College, a small, private, four-year liberal arts college, developed a retention program which was based on a listing of all

students who requested that their transcripts be sent to another school. A faculty member, an administrative staff member, or a paraprofessional student-staff member personally contacted each individual on the list to determine and act upon any individual concerns that were expressed. The number of students who voluntarily left the college was reduced from 123 to 59 in less than one year (Scher, 1979).

In a study completed by Ward (1958), students enrolled at The University of Tennessee, Knoxville were divided into three main categories. The categories consisted of students identified on the basis of low test scores only, students selected on the basis of poor high school grade point averages only, and students selected on the basis of both low test scores and poor high school grade point averages. These students were tracked for approximately four years. Of those students in the first two categories consisting of either low test scores or poor high school grade point averages, approximately 25 percent were considered successful after the four year period. Success was defined as as earning a cumulative college grade point average of 2.00 or better. Of those students in the third category consisting of both low test scores and a poor high school grade point average, approximately 15 percent were classified as successful. However, none of these "successful" students had graduated at the time of assessment. None of the students remaining in college and classified "successful" graduated in the standard four year cycle or the twelve quarters usually required for graduation (Ward, 1958). A subsequent follow-up was not made. Ward concluded that for The University of Tennessee, Knoxville, a low high school grade point average or a low composite ACT score seriously

impaired an individual's chance of success. The success rate of three categories of students in her study was much lower than that of the total student body (Ward, 1958).

II. ACADEMIC CONSIDERATIONS

High School Grade Point Average

Probable retention in college has best been measured by the high school or other previous grade point averages (Astin, 1975; Cope, 1978). Astin (1975) determined that of the high school students with "A" averages in high school, 87 percent persisted in college; of those with "B" averages, 66 percent persisted; and of the students with "C" averages, only 44 percent persisted. A persister was defined as any student who, at the time of the follow-up study four years later, had earned at least a Bachelors degree or was still enrolled full-time. A student's chance of dropping out of college increases consistently as the high school grade point average decreases (Astin, 1975).

Approximately one student in three obtains the same grades in college as in high school, only one in five obtains higher grades, and almost half obtain lower grades. It would be unrealistic for most new college freshmen to expect to improve their academic performance in college; they should be prepared to obtain the same or lower grades in college (Astin, 1977).

Astin (1977) also studied the self-predictions made by students concerning their own chances of obtaining good grades. It was concluded that freshmen self-predictions were substantially accurate, regardless of high school grades. However, high school grade point average proved

to be a better predictor of college grades than self-predictions (Astin, 1977).

To date, most research has focused on biographic or demographic variables or on the comparative analysis of experimental and control groups. A fruitful area of research could materialize in modifying prediction equations to include self-assessment variables supplied by the students themselves. For example, on the Student Information Form published by the American Council on Education (ACE) which is often administered in conjunction with one of the scholastic ability exams, there is a question which asks the student if he or she feels that any special tutoring or remedial work will be needed while in college; approximately one-third of all those completing this form made an affirmative response to this question (Astin, King, and Richardson, 1978). One of the supplementary questionnaires of the ACT, the Student Profile Section, also contains a similar question. Even if nationally standardized prediction equations do not utilize this information, each campus should make a minimal effort to have each of these students personally contacted by an academic advisor with an offer of assistance.

Academic Ability Tests

Tests of academic development such as the ACT and SAT are designed to measure high school achievement in academic courses normally taken by college-bound students. Most higher education institutions use the results of either the SAT or ACT when predicting first year grade point average. The ACT is considered to be more curricular or subject oriented while the SAT is considered more factor oriented (Kuh, 1977). As expected, scores on the ACT and SAT are correlated with academic

course grades in the first year of college (Munday, 1970). The tests' predictive validities are similar enough so that most institutions can use either one in prediction formulas (Kuh, 1977).

Nationally, composite ACT scores remained fairly stable during the period under study from Fall Quarter 1968 through Summer Quarter of 1973, although a modest decrease could be detected throughout this period (Munday, 1973). For The University of Tennessee, Knoxville, composite ACT scores of entering freshmen remained stable throughout this period. Table I provides the annual ACT composite score comparisons of all college-bound students with all freshmen enrolling at The University of Tennessee, Knoxville, the subsequent Fall Quarters.

The constant and rather rapid decline of ACT national norms began in 1971 and continued through 1977. To account for this substantial decline in ACT scores, most researchers have subscribed to the "changed-pool" theory. This explanation attributed the decrease in ACT scores to change in the pool of college-bound students. The theory suggested that more students of lesser ability were attending college (Ferguson and Maxey, 1976; Ferguson and Maxey, 1978, Geiger, 1978; Munday, 1976b). There was, in fact, an increase over the past few years of the low-scoring students enrolling in college. These students were enrolling in institutions that had the greatest commitment to open admissions (Munday, 1976b).

However, there were other factors contributing to the decline in ACT scores. There is some evidence to suggest that recent test takers have been less-well-prepared than they were several years ago. Students in the elementary and secondary schools have recently shown lower scores

TABLE 1

ACT MEAN SCORES AND STANDARD DEVIATIONS FOR ENTERING
FRESHMEN, THE UNIVERSITY OF TENNESSEE, KNOXVILLE
CONTRASTED WITH NATIONAL NORMS: 1968-1973

	1968		1969		1970		1971		1972		1973		
	UTK	NAT	UTK	NAT	UTK	NAT	UTK	NAT	UTK	NAT	UTK	NAT	
English	Mean	20.6	18.1	21.1	17.7	21.0	17.6	21.0	17.8	20.7	17.6	20.2	17.3
	S.D.	4.0	5.3	3.9	5.6	3.9	5.6	4.1	5.4	4.3	5.4	4.5	5.4
Mathematics	Mean	21.7	19.5	22.4	18.7	23.2	18.6	23.0	18.8	22.8	18.1	21.9	17.4
	S.D.	6.1	6.7	6.0	7.2	5.6	7.3	6.2	7.2	6.2	7.5	6.4	7.8
Social Studies	Mean	22.0	19.3	22.0	18.3	22.1	18.4	21.9	18.1	21.7	17.9	21.0	17.1
	S.D.	5.2	6.8	5.4	7.2	5.4	7.3	5.7	7.5	5.9	7.6	6.4	7.6
Natural Science	Mean	22.4	20.5	22.8	20.2	23.3	20.3	23.6	20.5	23.4	20.6	22.9	20.8
	S.D.	5.5	6.1	5.5	6.4	5.3	6.5	5.4	6.5	5.5	6.5	5.8	6.4
Composite	Mean	21.8	19.5	22.2	18.9	22.5	18.8	22.5	18.9	22.3	18.7	21.6	18.3
	S.D.	4.2	5.3	4.1	5.6	4.1	5.7	4.3	5.8	4.4	5.8	4.8	5.9

Source: ACT Class Profile Reports, The University of Tennessee, Knoxville: 1968-1973;
Class Profile National Norms, 1968-1973; ACT Research Report No. 70.

on achievement tests than their counterparts of five to ten years ago (Munday, 1976b). Also, the decreased emphasis on ACT scores for admissions has probably affected not only the attention and preparation allocated by high school administrators to the ACT but also the attitude of the student taking this exam. Motivation to do one's best on an exam of this type might be questioned when it is known in advance that the results will not affect admissions to an in-state institution (Geiger, 1978).

(The research has clearly documented the general conclusion that dropouts usually have lower composite aptitude test scores.) However, these differences have not been useful for an applicant-to-applicant admissions decision (Cope and Hannah, 1975). Even when aptitude test scores were combined with the other best predictor of college success, high school grades, the results were inapplicable on an individual basis. The results have clearly illustrated the inability to predict with any accuracy which students will drop out of college and which ones will not (Cope and Hannah, 1975; Kuh, 1977).

Researchers consistently have noted that the best measure of retention was the high school or other previous grade point average. The second best measure was the student's own ability as measured by student scholastic aptitude tests (Cope, 1978). One of Astin's studies (1977) accumulated facts from more than 300 institutions of higher education and longitudinal data on more than 200,000 students; the results presented the major findings on the first ten years of this major research program. Astin noted that students of differing academic ability as measured by college admissions tests differ in characteristics

at college entry and these differences either persisted or expanded with time. As expected, highly able students were much more likely than their less able peers to complete college. Clearly, higher education was designed primarily for highly able students (Astin, 1977). The young people who had not considered going to college in the past but who were newly entering college in the 1970's were distinguished more by the low test scores than by any other single measure available including race, sex and socioeconomic status (Cross, 1974).

The significance of low academic ability test scores as identified by Cross, focused attention on those individuals admitted to The University of Tennessee, Knoxville, with a composite ACT score of 16 or less. The 16 composite ACT score was selected for two reasons. One, students participating in the grant program entitled "Special Services for Disadvantaged Students" were selected from the pool of those admitted to The University of Tennessee, Knoxville, with a composite ACT score of 16 or less. And, two, students not graduating from an approved Tennessee state high school have not been admitted to The University of Tennessee, Knoxville, unless they have had at least a 17 composite ACT score or a high school grade point average of 2.25.

The University of Tennessee, Knoxville, operates under the admissions policy previously described and these admission standards were in effect throughout the period of this study. As a result of this policy, approximately 1,600 freshmen with an ACT composite score of 16 or less are now admitted each Fall Quarter. This figure represents approximately 27 percent of the freshman class (Aldmon, 1977).

The distinction between those students with a composite ACT score of 16 or less and those students with a composite ACT score of 17

or greater seems reasonable. The marginal students or the "new students" as described by Cross (1974) are those who score in the lowest third on tests of academic ability.

College Grade Point Average

Nationally, students' college grade point averages remained fairly stable during the period under study from Fall Quarter 1968 through Summer Quarter of 1973 although a modest inflation of grades could be detected. The nationally visible and rapid inflation of college grades began around 1972 or toward the end of the period under study and continued to escalate through the 1970's (Ferguson and Maxey, 1976).

The relative importance of college grades in relation to attrition is also indicative of this inflation as reflected in the literature. In the late 1960's and early to mid 1970's, it was well known that no matter what the grades were in high school and regardless of the scores on the ability tests, college grades had a major bearing on whether or not a student completed his or her undergraduate work. College grades were an excellent measure or predictor of persistence (Astin, 1975). Morrissey (1971) reported on the importance of the first-semester grade point average. Students with low first-semester grade point averages had a greater tendency to drop out, and those with high first-semester grade point averages tended to persist. Morrissey explained this as the building of self-confidence and the self-reinforcing effect of higher grades. This finding supported the hypothesis that there is a relationship between first-semester grade point average and attrition (Morrissey, 1971). However, first-semester grades have been an accurate predictor of attrition when grades are low, but high grades do not guarantee persistence (Pantages and Creedon, 1978).

Although grade point average is still positively correlated with retention, academic dismissal for failure to maintain a specific grade point average appears to be a phenonemon of the past. In the 12 state regional study of attrition, it was found that 93 percent of the drop-outs reported college grade point averages of 2.00 or better (Tibby, et al., 1978). Cope and Hannah (1975) chastized members of the faculty and administration for this waste of institutional and human resources when they wrote:

Unfortunately, most college faculty and administrators take a we-would-rather-not-know attitude toward withdrawal data, and thus the extent of the problem--if it is a problem--is not known. There is also a he-or-she-couldn't-make-the-grade attitude. First, most institutions do not recognize the large proportion who leave and then, if discovered, assume the student must be at fault. In addition to high attrition rates it also goes unrecognized that the majority of withdrawing students at almost every institution we examined were doing satisfactory academic work (at least C average) at the time of withdrawal. For example, in samples taken from 12 private colleges mentioned earlier, only 21 percent left under conditions of inadequate academic performance, another 17 percent were doing marginally well, but 61 percent left under conditions of satisfactory to superior academic performance. Our studies and reviews of other research reveal that many students, especially at the more selective institutions, are leaving because of dissatisfaction with the academic process, because of the social environment, and because of the desire not to get "caught up in a meaningless rat race." In fact, some studies (e.g., Mehra, 1973, p. 15) are beginning to report that voluntary withdrawals have significantly higher grades than do students who stay on to graduate (p. 5).

Astin (1977) opposed the notion that college grades are either no longer important or should be deemphasized because they reputedly have little or no relevance to success in later life. Astin referred to such notions as "educational folklore" receiving considerable support during this decade. When a negative relationship between college grades and career success was found, it was usually because the study compared

college grades of members within the same profession while excluding the comparison of the college grades of all those originally aspiring to that profession who had fallen by the wayside (Astin, 1977).

Impact of Faculty

The attitude of faculty, administrators and staff toward students is a significant factor contributing to the retention of students. These individuals should all think honestly about attitudes that may become negative factors in retention by causing students to become dissatisfied. A satisfied student is one of the most important assets of any institution and a dissatisfied student is one of the most damaging liabilities. When students become dissatisfied, they transfer or withdraw from higher education altogether or worse, they drop out intellectually even though they may physically remain on the campus (Jose, 1978).

Nebraska Wesleyan conducted a four year study of all students leaving the institution before receiving a baccalaureate degree. At this private institution a selective admissions policy was in effect. The results of this study indicated that there were two primary conditions which needed to be fulfilled in order for a student to remain in school: a student needed to be instilled with a sense of responsibility to a group of fellow students or the entire academic community; and, a student needed to have a personal interest and concern expressed in him or her by an individual faculty member (Benjamin and Wieggers, 1974).

Similar findings in another study supported the conclusion that informal student-faculty contact, particularly during the freshmen year experience, was an important predictor of college persistence (Pascarella and Terenzini, 1977). In another study, students who left college

expressed the opinion that they might have continued if closer ties with at least one faculty member had been developed. Yet, it often seemed that the students made no attempt to develop such contacts, and often the faculty seemed to be quite interested in students and easily approached by those who tried (Proceedings of the Research Conference on College Dropouts, 1964).

The proceedings from this conference also commented on faculty grading practices as related to attrition. The report stated:

This matter of grading practices may be among the more serious and important aspects of the drop out problem. One wonders why it is that in most medical schools it is the tradition that students once admitted are expected to graduate and the faculty actively seeks to aid them in reaching that goal--indeed, most of the students do survive. In other programs, such as law, which tend to draw equally-able entering students, much lower rates of survival prevail. The crux of the issue is the faculty's attitude toward grading (p. 17).

Astin (1977) further discussed faculty-student interactions, with particular attention to the larger institutions. He noted that the shift from traditional undergraduate concerns to graduate education had a direct effect on student-faculty involvement. Realistically, it is almost impossible to foster meaningful faculty-student personal relationships in the large, impersonal, urban, and hurried campus environment. This is hardly the "caring environment" or the "home away from home" advertised in most college catalogues (Astin, 1977). Individuals leaving the large university expressed concerns about the quality of teaching, the size of classes, and the heavy utilization of lecturing (Cope and Hannah, 1975).

Cope (1978) reported that social interaction with faculty was related to retention, especially when the interaction consisted of

discussions of intellectual or course-related matters. And, some evidence has suggested that this interaction has more of an impact outside the classroom environment. A number of promising retention programs were designed to integrate "significant others" from the faculty into the individual student's campus experience (Cope, 1978).

Many institutional leaders acknowledge the academic advisor as the coordinator of the educational experience. Academic advising, properly delivered, can be a positive institutional influence on student growth and development as well as enriching the educational program of any college or university. Helping students utilize the resources of the institution to implement academic plans which lead to desired career and life goals can be a powerful retention force. Crockett (1978) reported that he considered it unfortunate that academic advising on many college campuses was perfunctory, clerical and ineffectively delivered; academic advising should be the pillarstone of student retention.

Crawford, McFarland and Rhatigan (1978) described an "early alert" program designed to identify at the earliest possible time students showing signs of academic difficulties. Almost all counselors and faculty members agreed that a problem which could have been handled in October became more complicated if left unattended until December. It was reported that a simple contact from a faculty adviser interjected a human element and had a positive impact on the students. This program did not require substantial dollars, only substantial effort (Crawford, McFarland, and Rhatigan, 1978).

III. PERSONAL CHARACTERISTICS

Sex Classification

Cope and Hannah (1975) carefully reviewed the literature and reported that males tend to have a higher attrition rate although a few studies found a slightly higher attrition rate for women. They cautioned, however, that while there was a tendency for most studies to find more men withdrawing than women, when adequate follow-up studies including reentry and transfer were conducted, little or no variation in the attrition rate for men and women were found. Longitudinal studies have shown that women tend to graduate on schedule more often than men, but men tend to more frequently complete the degree requirements (Cope and Hannah, 1975). The literature was reviewed at a later date with the same conclusion: the students sex appears to be somewhat related to retention, with most research reporting more men persisting to graduation (Cope, 1978).

As with socioeconomic status, sex has been found to be more directly related to being admitted than to persisting once admitted. The Carnegie Commission on Higher Education (1971) reported:

Enrollment rates for women in higher education, as a percentage of the relevant age group, are distinctly lower than for men. We have already noted that low socioeconomic status tends to be a more significant barrier for women than for men and that relatively more women indicate that they "prefer marriage."

Among women aged 18 to 19, for example, only 35 percent were enrolled in college in 1970, as compared with 40 percent of the men. Sexual differences in enrollment rates were much larger for those aged 20 to 21 than for those aged 22 to 24. To a considerable extent, these differences in enrollment rates appear to be explained by the tendency of women to marry at relatively early ages. In all these youthful age groups, relatively more women than men were married in 1969, and although both women and men were comparatively unlikely to be enrolled in

college if they were married, the proportions of married women who were enrolled were considerably smaller in all three age groups than the corresponding percentages of married men. And because early marriage is especially prevalent among women in low income groups, it may also be a major explanation of the substantial gap between enrollment rates of male and female high school graduates in low socioeconomic status groups (p. 29).

The Black Perspective

Several important points must be made concerning higher educational institutions as they relate to black students. Black students find it relatively more difficult to get admitted to an institution of higher education. One of the most difficult barriers to higher education for minority groups has been low test scores and low academic performance. In the meritocratic era, college admissions was almost always determined by test scores and grades; the barriers imposed by environmental conditions of poverty homes and poverty schools have proven formidable for minority youth of college age (Cross, 1974). Astin (1978b) reported that test scores represent a much greater admissions obstacle for minority students, especially black students, than do grades.

The dramatic increase in the number of minority students was accomplished through adoption of more flexible admissions requirements. Once admitted, however, minority students were expected to perform like the traditional college student. It soon became evident that special programs were needed to introduce and acclimate the minority student and higher education to each other. As a result, the number of programs designed to assist minority students greatly increased during the late 1960's (Kuh, 1977).

Even though the number of minority students enrolled in colleges and universities has increased appreciably, a gross underrepresentation still exists in relation to the proportion of minorities in the population. Kuh (1977) found that among the numerous barriers to higher education (testing, poor preparation, lack of financial resources, racial discrimination), traditional admissions requirements were the most formidable.

The comparatively fewer numbers of black students in institutions of higher education was also a concern of the Carnegie Commission. The panel found that racial minority groups were seriously underrepresented in higher educational institutions. In 1970, there were 522,000 black students enrolled in degree programs in all institutions of higher education. Of these, 343,000 were 18 to 21 years of age, representing 21 percent of the black population in that age group, as compared with a corresponding proportion of 36 percent for whites. In the 22 to 24 age group, in which students would be likely to be enrolled in graduate work, only 7 percent of the black population was enrolled, as contrasted with 15 percent of the white population (Carnegie Commission on Higher Education, 1971).

Increasing the number of minority groups at lower educational levels appears to offer substantially greater potential for eventually increasing the representation of minorities in graduate and professional schools than do changes in graduate and professional school admissions procedures (Henson and Astin, 1978). However, Cross (1974) realistically wrote:

Almost anyone writing about the problems of assuring members of ethnic minorities equality of educational opportunity concludes the review of statistics by recommending that we start to correct the injustices at the earliest possible age, and the logic of that position cannot be faulted. But even if we eradicated the poor learning environments of minority youngsters tomorrow, the prospective candidates for higher education in the next decade are already in the first grade. For at least the next several decades, higher education will be held accountable for devising the methods that can assist in eradicating the educational disadvantages of minority youth born in a majority culture (p. 130).

Institutional variables related to retention and attrition were studied in a 12 state region where the college enrollment history of all students taking the SAT was available. It was determined that the drop out rate in institutions of higher education was higher among black Americans than any other minority group (Tibby, et al., 1978).

Information available suggests that more attention should be given to the recruitment and retention of black students at The University of Tennessee, Knoxville. In 1977 this institution admitted approximately 1600 students with a composite ACT score of 16 or less. In terms of the 1977 student body, 8.03 percent of the white students but 28.67 percent of the black students in attendance were admitted with a composite ACT score of 16 or less (Aldmon, 1977). And, a report issued by THEC has indicated that minorities are underrepresented at all degree levels and that minority students are not as successful as nonminority students in progressing toward a degree ("Survey of Graduates," 1977).

The Disadvantaged

The term "disadvantaged" is frequently used synonymously with membership in a particular racial minority group. Public resistance to special admissions or special assistance programs appears to be much stronger when race rather than disadvantage is the primary

consideration (Astin, 1978b). The problem has now become the balancing of conventional admissions criteria and selection to special assistance programs with a careful assessment of disadvantage among both minority as well as nonminority students (Fuller and McNamara, 1978). The public is willing to accept disadvantage over racial criteria because such an approach makes it possible to favor disadvantaged white groups such as Appalachians and does not give favored treatment to those minority candidates who do not come from economically or educationally disadvantaged families (Astin, 1978b).

Astin (1978b) demonstrated that it is possible to quantify disadvantage. By combining the two traditional indices of academic merit (high school grade point average and composite scores on the SAT) with three weighted measures of socioeconomic disadvantage (level of education attained by student's mother, level of education attained by the student's father, and parental income), Astin demonstrated that disadvantage can be quantified. Astin's study consisted of a national sample of 115,325 undergraduates entering college as full-time freshmen in the fall of 1975. Astin briefly discussed the logic behind selecting the three measures of socioeconomic disadvantage in his study; he wrote:

Using these three measures as indices of disadvantage assumes that students will receive more intellectual stimulation and encouragement to achieve academically if parents are highly educated. Similarly, the measures assume that affluent parents are in a better position to provide the student with resources that promote intellectual development: space for studying, books, tutors and special remedial assistance, travel, and so on. Further, an affluent family is likely to live in a community where the academic level in the local schools is relatively high. Even if the affluent family does not live in such a community, it can afford to send the child to a private

school. In short, one can assume that students from affluent families in which both parents have graduate degrees will generally have much greater opportunities to develop their intellectual skills than students from poor families in which neither parent finished high school (p. 76).

Although disadvantaged students can be identified, to date, institutions have neglected to diversify traditional educational programs to meet the needs of the nontraditional students. Attention has been focused on the creation of access models to higher education. For the most part, nontraditional students are now eligible to participate in the traditional higher education experience. However, educational systems need to be redesigned to fit the learning needs of these new students (Cross, 1974).

It is clear that college and university student bodies never again will consist almost entirely of students of the 18 to 22 year old, white, and middle to upperclass socioeconomic background. These students will continue to attend, but they are being joined by greater and greater numbers of the students who are older, minority, and from lower socioeconomic background (Munday, 1976a).

Again, these disadvantaged students will be the losers if institutions simply concentrate on access programs rather than designing new educational programs to fit the needs of this substantial clientele (Cross, 1974). Mayhew (1977) also insisted that disadvantaged students could not be expected to conform to orthodox academic arrangements if they were to survive the higher educational experience.

Social systems of inequality exact a heavy toll from everyone. One of the tragedies of human history is that societies have developed status systems that have as a byproduct the assignment of low worth to

some people (Munday, 1970). Institutions have the responsibility to assess needs and design developmentally conducive environments for all students, although the disadvantaged student is certainly the least prepared and therefore the most needy (Barna, Haws, and Knefelkamp, 1978). It is necessary to provide for increased services for disadvantaged students. Such efforts will undoubtedly increase the retention rates of students working toward the realization and attainment of educational and career goals (Wessell, Engle, and Smidchens, 1978).

✓ Involvement

Recently, the theory of student involvement has become a key concept in studies of retention. Briefly stated the theory suggests that the more the student is involved in the academic experience, the greater the learning and growth; the less involved, the less learning and growth and the greater the chance that the student will become dissatisfied with the educational experience and drop out to seek a more meaningful experience. The theory implies that a positive educational experience is in direct proportion to personal involvement and investment in the experience (Astin, 1978a). Personal involvement in the educational experience is accomplished through various forms of interaction. Getting students involved in the academic experience on an individual basis should be the concern of both faculty members and administrators (Benjamin and Wieggers, 1974).

Involvement of the students should begin with orientation programs. Astin (1975) suggested that student orientation sessions can be utilized in at least two ways to reduce attrition rates. First, students can be familiarized with the findings of studies on attrition and the facts from

their own background and environment which will affect their persistence rate. Providing students with this information would better enable them to elect environmental options that would help them complete college. And second, orientation sessions can be used to collect data from individual students to assist in computing estimates of attrition in addition to collecting additional information that would be of longitudinal research value to the institution (Astin, 1975).

An interesting finding resulted from a study completed at Drake University. In that study, it was determined that the attrition rate was 7 percent for freshmen who attended a two day summer orientation but the attrition rate was 60 percent for those who did not (Campus Newsletter, 1979). Such findings do not, of course, imply causality or that attending summer orientation sessions reduces attrition. Attending summer orientation sessions is most probably a visible measure of a combination of other factors that are directly associated with retention such as personal commitment to enrolling in the institution, personal motivation, family financial resources, and willingness to become involved in the higher educational experience.

One of the most frequent opportunities for personal involvement has been in the residence halls or with the residential life program. Numerous studies have concluded that living in a residence hall enhanced college persistence (Astin, 1975). Specifically, those students living in residence halls dropped out less and completed their respective academic programs more frequently than did their counterparts in other residential settings. The chances of completing a degree were much greater for those students residing in residence halls (Astin, 1975).

The two classic studies by Chickering entitled Education and Identity (1969) and Commuting Versus Resident Students (1974) both provided convincing proof that students living in residence halls persisted longer and were more apt to graduate. The peer support and personal involvement associated with residential life was directly associated with retention. College dropouts perceived themselves as less involved and as less socially active than did college persisters (Cope, 1978).

Involvement with the academic experience also reduces attrition. The results of one experimental tutoring program for marginally qualified students determined that the tutoring program did not prove to be an advantage in terms of improving grade point averages. However, the data did suggest that the tutoring program did have a "holding" effect for the marginal students and offered a higher rate of continued college eligibility for all students participating regardless of previous academic preparation (Taylor, Roth, and Hanson, 1971). Similarly, a "retention advising program" (RAP) implemented at Idaho State University proved effective in reducing attrition (Edington and Gilliard, 1978). For many students, greater involvement in campus life and activities developed a stronger sense of identification with the institution which definitely served as a deterrent to dropping out (Astin, 1975).

There are numerous practical suggestions for personally involving individuals with the academic experience. Orientation, residential life, tutoring and advising programs are only a few. Work opportunities, extra-curricular activities, counseling, honors programs, and research are also areas deserving consideration.

Commitment and Motivation

Personal commitment may deserve more attention in both the admissions process and in research. Cope and Hannah (1975) indicated their conviction that personal commitment to either an academic or occupational goal is the single most important determinant of persistence in college. They cited several research studies which substantiated their conviction:

For example, Elton and Rose (1971) have reported a major difference in the persistence rate of a small sample (N=137) of vocationally decided and undecided freshmen; whereas only 17 percent of the undecided freshmen persisted to graduation, 43 percent of those who professed a career commitment graduated--even though the specific commitment may have undergone one or more changes. Abel (1966) reported that the persistence rate to graduation of failing students (less than C average) was twice as high if they were certain of their goals (p. 19).

For some, college attendance represents either an avoidance of some other activity, such as a low paying job, or simply the marking of time until marriage or military service. Attrition may be expected among students with, or without, various types of motivation (Knoell, 1966).

Lack of personal commitment or motivation exacts a particularly heavy toll on the low achieving students. Cross cited this pattern of "lack of effort" and "quitting the task" as the highest ranked obstacle to learning for low achieving students. Marginal students have had enormous difficulty meeting the challenges and the requirements of traditional academic institutions and found little support or appreciation for the skills that they did possess. The low achieving students have had experience with the reality of learning as an ego-threatening task. They were uncomfortable and unrewarded in previous educational environments, and are likely to repeat those experiences in our colleges and

universities unless new approaches are found to restructure their learning environments (Barna, Haws, and Knefelkamp, 1978).

Cross (1974) drew an analogy between the low achieving students and laboratory animals placed in a "no win" situation. Cross wrote:

In these experiments, the dog was placed in a box with an electric grid on the floor. The lights dimmed, ten seconds later the shock came on, and the dog howled and ran around showing fear and lack of purposive behavior. During this random activity, the dog managed to throw himself over the barrier and out of the box, at which point he escaped from shock and the lights went on again. The next time the lights dimmed, the dog started his fear reaction, the shock came on, and the escape from the box and the shock was more rapid and purposeful than before. With repeated trials, the dog finally jumped over the barrier as soon as the lights dimmed, thus avoiding the shock altogether.

However, the reaction was very different from dogs who had previously been shocked in the box while in a harness that prevented escape. Twenty-four hours later, these dogs entered the conditioning experiment "knowing" that nothing they did would terminate the shock. Struggling in the harness had no effect. When they were later put in the box unharnessed and free to learn to escape just as the naive dogs had been, they howled for just a few seconds when the shock came on and then settled down and took the shock. After several trials, the dogs ceased even to try to escape and became passive or helpless.

The situation is analogous to that of a young student who tries hard in the beginning but who finds that he never gets rewarded by an A, the teacher's approval, or classmates' admiration. In other words, his efforts, like those of the dog struggling in the harness, are futile. After repeated experience, he does learn something--that the result of trying is failure. The resultant personality characteristic would appear to be passivity in learning (p. 28).

Remedial programs have been implemented not only to improve the skills of marginally qualified students but also to build the self-confidence of the participants. Significantly, the major personal change attributed to the college experience by survivors in remedial program was an increase in self-confidence. Administrators of remedial services perceive the major obstacle to learning for low achieving students as the lack of effort or "has quit trying" attitude (Cross, 1974).

Cross indicated that the passive student must be shown that a new kind of learning situation exists in which a student can succeed if an effort is made to do so. The "guaranteed success" programs now being tried in some remedial education programs show considerable promise for helping students reorient themselves to learning tasks (Cross, 1974).

Anderson (1976) pursued these thoughts in detail when he wrote:

Unfortunately, most college student service offices have adopted a mode of operation which places the burden of initiating services upon the student. The philosophy on which this "student self referral" mode of operation is based postulates that colleges and universities should not play the role of "in loco parentis." In actuality, however, a relatively small percentage of students refer themselves for services under this system. Moreover, those who do refer themselves tend to do so only after their problems have reached a crisis state which makes problem solving extremely difficult, if not impossible.

Because we do care about our students and because we have documented that students who need our services most tend to request services least, we have adopted a *modus operandi* wherein we monitor student progress and performance to detect fluctuations which might be symptomatic of problems requiring attention (p. 696).

Although there is general agreement among the researchers that motivational factors contribute to retention, it has not yet been determined which motivational factors are predictive nor how they are to be measured (Pantages and Creedon, 1978).

Median Family Income by County

Aldmon (1977) indicated that the substantial number of white students scoring low on the ACT but nevertheless enrolled at The University of Tennessee, Knoxville was due to the influence of Appalachia. Astin (1978b) referenced Appalachians as a disadvantaged white group. Bailey (1966) wrote on the educational underdevelopment of the youth in the Appalachian region as one of the most acute educational problems in the

United States. The youth of the Appalachian region have not availed themselves of the college experience to the same extent as other American youth. The "talent loss" from inadequate education was determined to be an important factor to the economic and social problems of Appalachia. Bailey noted that nationally more than 50 percent of the high school graduates entered college while only 30 percent of the high school graduates in West Virginia, a state almost entirely in Appalachia, entered college during 1964. Further, he reported that only 62 percent of the West Virginia ninth graders graduated from high school in 1964 which placed that state 44th in the nation in comparison to all other states.

Family wealth by county was investigated in that individuals from Appalachian families have typically been reared in a poorer family environment. It is not entirely accidental that 87 percent of all high school graduates whose families earned \$15,000 or more entered college in 1967, as compared to only 20 percent of those whose parents earned less than \$3,000 (Jencks, 1972). Jencks continued his example when he wrote:

In a country where the top fifth of all families receives 800 to 1,000 percent more income than the bottom fifth, the fact that children from these same families attend schools whose expenditures differ by only 20 percent seems like a triumph of egalitarianism. Before a national celebration is begun, though, we must also take note of the fact that children from rich families stay in school longer than children from poor families. When we take this into account, we estimate that America spends about twice as much on the children of the rich as on children of the poor (p. 27).

The Carnegie Commission on Higher Education (1971) also reported similar findings that the proportion of family dependents attending institutions of higher education rose consistently with family income.

However, it was also noted in that report that low socioeconomic status was more of a barrier to college admissions than to continuing in attendance once admitted. Cope and Hannah (1975) acknowledged this same conclusion when they wrote:

Family income, occupation, and education are unified around the concept of social class. Within social classes the process of socialization means that children acquire many of the hopes, expectations, and compulsions of their parents; they also acquire verbal and auditory skills which have an effect on their ability to adjust to the academic and social demands of college. We believe that the commitment to finish college resulting from the motivational climate of the family is far more important than having enough money in accounting for the student's own efforts to solve money problems. Many of the claims of dropping out because of finances could easily be claims of dropping out because of lack of commitment. Lack of finances is more of a barrier to starting college than it is to finishing college (p. 18).

Bailey's (1966) work discussed earlier also references the disproportionate or reduced attendance by dependents from families with financial hardships and in particular those from Appalachia. It was also noted by Cope (1978) that family's socioeconomic status is one of the most reliable predictors of retention.

Median family income of each county was published in the Tennessee Statistical Abstract: 1977 and Tennessee home county was a part of each students' permanent record which was accessible through computer files. Thus, although the most preferred indicator of socioeconomic status, family income, of each individual was not available, median family income by county was available for use as a reasonable indicator of socioeconomic status.

CHAPTER III

METHODOLOGY

I. INTRODUCTION

A meeting in November of 1978 on the subject of student retention and attrition in higher education was held in Nashville and attended by one representative from each of the State Board of Regents (SBOR) institutions, several THEC staff members as well as a staff representative from NCHEMS. Those present agreed to cooperate in a state-wide study designed to collect information that would be helpful in designing plans for reducing the attrition rate at each of their respective institutions.

The representative from NCHEMS provided a description of the battery of five instruments available through NCHEMS for utilization by campuses interested in collecting information for decision making at participating institutions. The participants at the Nashville meeting agreed to have their respective institutions prepared for the administration of the Former-Student Questionnaire prior to the close of the 1978-79 academic year; they also agreed to initiate the utilization of the Entering-Student Questionnaire through their respective institutional Summer or Fall Quarter orientation programs. The utilization of the latter instrument was to be implemented by Fall Quarter of 1979.

One thoughtful representative in attendance at this meeting, after carefully reviewing one of the NCHEMS instruments, noted that every informational element that was going to be collected on each

student by the instrument was already collected and stored on institutional computer files on their respective campuses. After some discussion, it was agreed that it would just be easier to collect these data again on each student so that it would be available on one document immediately accessible for analysis rather than attempting to retrieve existing information in the desired format. That conversation conveyed a powerful reminder of Astin's (1978a) imperative that administrators must find better ways to synthesize, analyze, evaluate, and process the tremendous amounts of information available to them.

II. DATA COLLECTION

It was necessary to use a variety of procedures to generate a master tape containing the information to be used in this analysis. The first procedure was to take the Fall Quarter, 1968 Permanent Student Record Master Tape (PER-SRM), and identify every in-state freshman with an ACT score as part of their record. Once these students were identified, individual information was duplicated onto a file tape; the information duplicated consisted of social security number, quarter and year enrolled, composite ACT score, high school cumulative grade point average, home county, marital status, sex, date of birth, race, and initial college in which the student enrolled. The file copy generated by this process was then compared with the 1969 Winter Quarter PER-SRM and the same individual information on all in-state freshmen with an ACT score entering that Winter Quarter was identified, extracted, and

merged onto the file tape. Similarly, this process was repeated on the 1969 Spring Quarter PER-SRM and on every PER-SRM for each subsequent quarter up through the 1973 Summer Quarter PER-SRM. Thus, individual records for 20 consecutive quarters or 5 full academic years were generated with the individual information specified.

The tape that resulted from that process was then sequentially rematched with the 1971 Summer Quarter PER-SRM, the 1971 Fall Quarter PER-SRM, and 1972 Spring Quarter PER-SRM, and every subsequent Fall and Spring Quarter PER-SRM up through the 1978 Fall Quarter PER-SRM. On each of these sequential executions, the computer identified whether or not the individuals on the file tape had graduated from this institution. If so, the month and year of graduation was merged onto the file tape as part of the individual record. As records were carried for several quarters following graduation, it was not necessary to check every PER-SRM. However, it must be noted that every individual identified on the file tape was "tracked" for a minimum of five full years or twenty consecutive academic quarters. Thus, from this information it could be determined if a student entering in Summer Quarter of 1973 graduated within five years or by the end of Spring Quarter, 1978. However, it could also be determined if a student entering Fall Quarter of 1968 had graduated within ten years or by the end of Summer Quarter, 1978.

The tape that resulted from this process was then matched with the current Grade Summary Tape (GST). Fortunately, approximately 15 years of records were on this one tape and those 15 years spanned the

entire period under study. Through this process, the enrollment status on each individual student was checked for 20 consecutive quarters. This procedural execution also collected each individual student's cumulative grade point average as of his or her last quarter of attendance. In addition, new student identification numbers were inserted in place of the social security numbers so that the anonymity of each individual student would be insured. The individual information available for analysis now consisted of student identification number, quarter and year of enrollment, composite ACT score, high school cumulative grade point average, home county, sex, marital status, race, date of birth, college of initial enrollment, graduation date, cumulative college grade point average, and enrollment status for 20 consecutive quarters.

The resulting computer file tape, Tape Number 006772,^{*} now consisted of individual information on over 17,000 in-state freshmen from this five year period. The sample selected through the process described was considered more than sufficient not only for making inferences about the total group or entire population of individuals originally admitted as in-state freshmen during this five year period but also for conceptualizing the probable persistence patterns of in-state freshmen who have subsequently been admitted.

^{*}The computer tape is catalogued by this number and is available for further research through the Supervisor of Administrative Data Processing, Administrative Computing Center, Room P204 of the Andy Holt Tower, The University of Tennessee, Knoxville.

III. ANALYSIS

The Statistical Package for the Social Sciences (SPSS) was chosen for the analysis of questions one, two, five, and six. The SPSS was chosen for its superior labeling and recoding capacities. Missing information on any individual record was accommodated through the SPSS program and the recoding of data to common elements was also accomplished prior to conducting any analysis. For example, it was possible to collect the date of birth on each individual student; however, for the purposes of the study, it was necessary to determine the age at the time of enrollment so that each individual in this longitudinal study would be analyzed on the same base rate. Thus, through the recoding process, date of birth on each individual was changed to age at time of enrollment. The SPSS program designed to accomplish the recoding of data and the analysis of questions one, two, five and six is contained in its entirety as Appendix A.

The Statistical Analysis System (SAS) routine was chosen for the analysis of questions three and four. The information as recoded through the SPSS was absorbed by the SAS routine prior to the conducting of any analysis; thus, all information analyzed throughout the course of the computer processing was identical. The SAS was selected for its plotting and graphing capabilities; the SPSS could only produce a scattergram. The SAS program designed to accomplish the analysis of questions three and four is contained in its entirety as Appendix B.

These data were analyzed descriptively by the computer providing frequency and percentage of individuals in each of the eight biographic or demographic categories: race, sex, marital status, composite ACT

score, high school cumulative grade point average, county wealth, enrolled college and age. In addition, the descriptive analysis was further supplemented by comparatively graphing the persistence and graduation patterns for 20 consecutive quarters of the students in these same categories. Stepwise discriminant analysis was utilized as a classification technique for predicting the probability of graduation.

To simplify the analysis of the county wealth variable, the counties in Tennessee were rank ordered from lowest median family income to highest median family income and then separated by quartiles into four groups. Table 2 resulted from this procedure. It should be noted that of the ten lowest median family income counties, eight were in the Appalachian region, although the remaining counties in Appalachia were equally spread throughout the other three groupings.

IV. RESEARCH QUESTIONS

1. Of the in-state freshmen enrolled at The University of Tennessee, Knoxville from Fall Quarter, 1968 through Summer Quarter, 1973, what percent graduated from The University of Tennessee, Knoxville within 20 consecutive quarters from their respective dates of admissions?

2. Classifying these same students at time of enrollment by race, sex, marital status, composite ACT score, high school cumulative grade point average, county wealth, enrolled college or age, what were the percentages of students enrolled in each category in comparison with the percentages of students graduated in each category within 20 consecutive quarters from their respective dates of enrollment?

TABLE 2
TENNESSEE COUNTIES RANK ORDERED BY MEDIAN FAMILY INCOME

COUNTIES BELOW 1ST QUARTILE				COUNTIES BETWEEN 1ST AND 2ND QUARTILES				COUNTIES BETWEEN 2ND AND 3RD QUARTILES				COUNTIES ABOVE 3RD QUARTILE			
County Name	Median Family Income	Rank	County Name	Median Family Income	Rank	County Name	Median Family Income	Rank	County Name	Median Family Income	Rank	County Name	Median Family Income	Rank	County Name
Hancock	2683	1	Campbell	4389	11	Squatatchie	6111	49	Humphreys	7850	84				
Clay	3701	2	Haywood	4474	12	Marion	6118	50	Wilson	7878	85				
Jackson	3916	3	Pickett	4612	13	Greene	6182	51	Blount	7898	86				
Frentress	3937	4	Lake	4737	14	Crockett	6192	52	Bradley	7922	87				
Scott	4172	5	Bledsoe	4738	15	Carte	6195	53	Williamson	8191	88				
Grundy	4183	6	Macon	4854	16	Weakley	6208	54	Knox	8195	89				
Fayette	4205	7	Trousdale	4876	17	Jefferson	6295	55	Sumner	8208	90				
Claiborne	4266	8	Johnson	4906	18	Hawkins	6300	56	Sullivan	8372	91				
Overton	4348	9	Union	5005	19	Lincoln	6306	57	Anderson	8558	92				
Lauderdale	4357	10	Grainger	5086	20	Sevier	6377	58	Hamilton	8609	93				
			McNairy	5145	21	Moore	6404	59	Shelby	8671	94				
			Meigs	5311	22	Warren	6464	60	Davidson	9473	95				
			Morgan	5363	23	Unicoi	6487	61							
			Perry	5424	24	Union	6564	62							
			Cocke	5437	25	Benton	6597	63							
			Hickman	5441	26	Dyer	6598	64							
			Stewart	5444	27	Franklin	6599	65							
			Chester	5445	28	Robertson	6621	66							
			Cumberland	5476	29	Polk	6678	67							
			Hardin	5511	30	Gibson	6747	68							
			Wayne	5566	31	Carroll	6762	69							
			Hardeman	5603	32	McMinn	6868	70							
			White	5646	33	Loudon	6900	71							
			Henderson	5689	34	Dickson	7001	72							
			Rhea	5705	35	Bedford	7048	73							
			Smith	5737	36	Marshall	7168	74							
			Dekalb	5782	37	Hamblen	7219	75							
			Lawrence	5788	38	Montgomery	7220	76							
			Putnam	5813	39	Maury	7251	77							
			Tipton	5839	40	Washington	7259	78							
			Houston	5848	41	Madison	7308	79							
			Cannon	5885	42	Roane	7401	80							
			Monroe	5921	43	Cheatham	7646	81							
			Giles	5943	44	Rutherford	7664	82							
			Henry	5980	45	Coffee	7677	83							
			Lewis	6003	46										
			VanBuren	6014	47										
			Decatur	6075	48										

Source: Tennessee Statistical Abstract: 1977, Table 11.6, pp. 407-409.

3. What was the pattern of persistence and the pattern of graduation in academic quarters as determined by the numbers in attendance each subsequent quarter for 20 consecutive quarters?

4. Did the pattern of persistence or the pattern of graduation in academic quarters of these students differ when graphically compared on the basis of race, sex, marital status, composite ACT score, high school cumulative grade point average, county wealth, enrolled college or age?

5. At date of enrollment, could the combination of composite ACT score, high school cumulative grade point average, and county wealth have accurately predicted persistence through graduation on an individual basis?

6. Of the in-state freshmen enrolled but not graduated within 20 consecutive quarters, what percent had a 2.00 or higher cumulative grade point average at the end of their last quarter in attendance?

Chapter IV is organized using the research questions listed above as a framework.

CHAPTER IV

ANALYSIS, PRESENTATION, AND INTREPRETATION OF DATA

I. INTRODUCTION

The data collected from the institutional computer files were analyzed and reported in this chapter according to the six research questions presented in Chapter III. Tables are constructed to present the findings while textual discussion helps to explain the tables and any identified trends. The frequency tables show the numbers of individuals as well as their respective percentages within each of the categories being analyzed. The tables do not contain values for "missing data elements;" therefore, totals for each table will vary depending on the total number of valid data elements in the category being analyzed. As part of the analysis, figures were prepared to visually illustrate the findings as related to the persistence and graduation patterns of in-state freshmen.

II. IN-STATE FRESHMEN GRADUATED WITHIN FIVE YEARS OF ADMISSIONS

The first research question concerned the percentages of in-state freshmen graduated within five years of their respective dates of admissions. Table 3 indicates the quarterly enrollment distribution for the five years with 71.6 percent of the in-state freshmen beginning to attend The University of Tennessee, Knoxville during one of the five Fall Quarters in this longitudinal study. Another 22.8 percent of the students began attending during a Summer Quarter while the

TABLE 3
FIVE YEAR ADMISSIONS SUMMARY OF
IN-STATE FRESHMEN BY QUARTER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FALL QUARTER	1.	12396	71.6	71.6	71.6
WINTER QUARTER	2.	600	3.5	3.5	75.1
SPRING QUARTER	3.	363	2.1	2.1	77.2
SUMMER QUARTER	4.	3946	22.8	22.8	100.0
	TOTAL	17305	100.0	100.0	

remaining 5.6 percent began attending during a Winter or Spring Quarter.

Table 4 indicates that 38.8 percent of all in-state freshmen admitted during the five years graduated within 20 consecutive quarters from their respective dates of admissions. The remaining 61.2 percent were not graduated within 20 consecutive quarters or five full years.

Those in-state freshmen admitted Fall Quarter of 1968 accumulated ten years of academic records for analysis by Summer Quarter of 1978 at which time data for this study were no longer collected. Table 5 indicates that 39.6 percent of those in-state freshmen admitted Fall Quarter of 1968 graduated within five years while Table 6 indicates that 48.4 percent graduated within ten years from the Fall Quarter, 1968 admissions date. Thus, another 8.8 percent of the admitted in-state freshmen received a baccalaureate degree after the fifth year but before the end of the tenth year following the Fall Quarter, 1968 admissions date.

III. CATEGORICAL ANALYSIS OF IN-STATE FRESHMEN GRADUATED WITHIN FIVE YEARS OF ADMISSIONS

The second research question focused on the graduation percentages of the individuals within the classifications specified: age, sex, marital status, county wealth, race, college enrolled, high school grade point average, and composite ACT score. Table 7 indicates that 97.3 percent of all individuals admitted as in-state freshmen were less than 21 at the time of their respective admissions while only 2.7 percent were 21 or older. Table 8 indicates that of those graduated within 20 consecutive quarters from admissions 98.1 percent were less than 21 at

TABLE 4
FIVE YEAR GRADUATION SUMMARY
OF IN-STATE FRESHMEN

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.	6706	38.8	38.8	38.8
NO	2.	10599	61.2	61.2	100.0
	TOTAL	17305	100.0	100.0	

TABLE 5
FIVE YEAR GRADUATION SUMMARY OF
IN-STATE FRESHMEN ADMITTED
FALL QUARTER OF 1968

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.	909	39.6	39.6	39.6
NO	2.	1475	60.4	60.4	100.0
	TOTAL	2444	100.0	100.0	

TABLE 6
TEN YEAR GRADUATION SUMMARY OF
IN-STATE FRESHMEN ADMITTED
FALL QUARTER OF 1968

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.	1182	48.4	48.4	48.4
NO	2.	1262	51.6	51.6	100.0
	TOTAL	2444	100.0	100.0	

TABLE 7
ADMISSIONS SUMMARY OF IN-STATE
FRESHMEN BY AGE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
21 OR OVER	1.	468	2.7	2.7	2.7
LESS THAN 21	2.	16837	97.3	97.3	100.0
	TOTAL	17305	100.0	100.0	

TABLE 8
GRADUATION SUMMARY OF IN-STATE
FRESHMEN BY AGE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
21 OR OVER	1.	127	1.9	1.9	1.9
LESS THAN 21	2.	6579	98.1	98.1	100.0
	TOTAL	6706	100.0	100.0	

their respective dates of admissions while 1.9 percent were 21 or older. This information suggests that the traditional age students fared somewhat better than their relatively older counterparts.

Table 9 indicates that males constituted 55.8 percent of all in-state freshmen admissions during the five year period and females accounted for the other 44.2 percent. Table 10 determined that of those graduated within 20 consecutive quarters, 53.7 percent were males and 46.3 percent were females thus indicating that females proportionately increased and males proportionately decreased their numbers over the five year period.

Table 11 indicates that 91.2 percent of all individuals admitted as in-state freshmen were not married when admitted while the remaining 8.8 percent were married when originally admitted as in-state freshmen. Table 12 indicates that of those graduated within 20 consecutive quarters from admissions, 89.6 percent were not married at the time of admissions while 10.4 percent were married. This information suggests that married students tended to persist through graduation at a slightly higher rate than their non-married counterparts.

Some unexpected findings are shown in Table 13; unanticipated 76.3 percent of the in-state freshmen were admitted from the 12 wealthiest counties in Tennessee. The other 83 counties in Tennessee accounted for only 23.7 percent of the in-state freshmen. It should be noted that these 12 counties were also the most populated; however the Tennessee Statistical Abstract: 1977 indicates that only 54.6 percent of the total Tennessee population resided within these 12 counties, thus suggesting that the remaining 21.7 percent may be a function of median

TABLE 9
ADMISSIONS SUMMARY OF IN-STATE
FRESHMEN BY SEX

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
ALL FEMALES	1.	7653	44.2	44.2	44.2
ALL MALES	2.	9652	55.8	55.8	100.0
	TOTAL	17305	100.0	100.0	

TABLE 10
GRADUATION SUMMARY OF IN-STATE
FRESHMEN BY SEX

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
ALL FEMALES	1.	3103	46.3	46.3	46.3
ALL MALES	2.	3603	53.7	53.7	100.0
	TOTAL	6706	100.0	100.0	

TABLE 11
ADMISSIONS SUMMARY OF IN-STATE
FRESHMEN BY MARITAL STATUS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
SINGLE STUDENTS	1.	15790	91.2	91.2	91.2
MARRIED STUDENTS	2.	1515	8.8	8.8	100.0
	TOTAL	17305	100.0	100.0	

TABLE 12
GRADUATION SUMMARY OF IN-STATE
FRESHMEN BY MARITAL STATUS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
SINGLE STUDENTS	1.	6006	89.6	89.6	89.6
MARRIED STUDENTS	2.	700	10.4	10.4	100.0
	TOTAL	6706	100.0	100.0	

TABLE 13
 ADMISSIONS SUMMARY OF IN-STATE
 FRESHMEN BY COUNTY WEALTH

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
LOW INCOME	1.	217	1.3	1.3	1.3
MEDIUM LOW INCOME	2.	932	5.4	5.4	6.6
MEDIUM HIGH INCOME	3.	2956	17.1	17.1	23.7
HIGH INCOME	4.	13193	76.3	76.3	100.0
	TOTAL	17298	100.0	100.0	

family income of the county. The 10 poorest counties accounted for 3.5 percent of population but only 1.3 percent of the in-state freshmen admissions. A review of portions of Chapter III and Table 2 on page 53 may be helpful. Table 14 indicates that of those graduated within five years, the county percentages as reported in Table 13 remained approximately the same.

Table 15 indicates that 91.4 percent of the students admitted as in-state freshmen were white, 2.9 percent were black, and 5.7 percent were other ethnic or racial minorities. Table 16 indicates that of those graduated within 20 consecutive quarters, 95.4 percent were white, 2.5 percent were black, and 2.0 percent were other ethnic or racial minorities. The most noticable change was the percentage decrease in the "other" category.

The percentages of individuals admitted as in-state freshmen by college in which the students originally enrolled are presented in Table 17. Table 18 notes that of those individuals graduated within five years, the percentages by college of initial enrollment remained approximately the same. Many students had changed colleges and thus were no longer students in their respective college of initial enrollment; however, this comparison indicates that college of initial enrollment does not disproportionately affect an individual's chances of graduation with the possible exception of the College of Business. Only 34.3 percent of those students originally enrolled in the College of Business persisted through graduation. A total of 41.7 percent of the students originally enrolled in the College of Agriculture persisted through graduation in five years; 40.4 percent of the students originally enrolled in the College of Education persisted through graduation in five years; 42.9 percent of

TABLE 14
GRADUATION SUMMARY OF IN-STATE
FRESHMEN BY COUNTY WEALTH

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
LOW INCOME	1.	85	1.3	1.3	1.3
MEDIUM LOW INCOME	2.	377	5.6	5.6	6.9
MEDIUM HIGH INCOME	3.	1287	19.2	19.2	26.1
HIGH INCOME	4.	4956	73.9	73.9	100.0
	TOTAL	6705	100.0	100.0	

TABLE 15
ADMISSIONS SUMMARY OF IN-STATE
FRESHMEN BY RACE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
WHITE	1.	15814	91.4	91.4	91.4
BLACK	2.	498	2.9	2.9	94.3
CTHER	3.	993	5.7	5.7	100.0
	TOTAL	17305	100.0	100.0	

TABLE 16
GRADUATION SUMMARY OF IN-STATE
FRESHMEN BY RACE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
WHITE	1.	6400	95.4	95.4	95.4
BLACK	2.	169	2.5	2.5	98.0
CTHER	3.	137	2.0	2.0	100.0
	TOTAL	6706	100.0	100.0	

TABLE 17
ADMISSIONS SUMMARY OF IN-STATE
FRESHMEN BY COLLEGE OF
ORIGINAL ENROLLMENT

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
AGRICULTURE	1.	855	4.9	4.9	4.9
BUSINESS	2.	3950	22.8	22.8	27.8
EDUCATION	3.	3150	18.2	18.2	46.0
ENGINEERING	4.	1252	7.2	7.2	53.2
LIBERAL ARTS	5.	3952	34.4	34.4	87.6
OTHER COLLEGES	6.	2148	12.4	12.4	100.0
	TOTAL	17305	100.0	100.0	

TABLE 18
GRADUATION SUMMARY OF IN-STATE
FRESHMEN BY COLLEGE OF
ORIGINAL ENROLLMENT

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
AGRICULTURE	1.	356	5.3	5.3	5.3
BUSINESS	2.	1355	20.2	20.2	25.5
EDUCATION	3.	1272	19.0	19.0	44.5
ENGINEERING	4.	537	8.0	8.0	52.5
LIBERAL ARTS	5.	2296	34.2	34.2	86.7
OTHER COLLEGES	6.	890	13.3	13.3	100.0
	TOTAL	6706	100.0	100.0	

students originally enrolled in the College of Engineering persisted through graduation in five years; 38.6 percent of the students originally enrolled in the College of Liberal Arts persisted through graduation in five years; and 41.4 percent of the students originally enrolled in all other colleges persisted through graduation in five years. The rate of persistence through graduation of all students was 38.8 percent as presented in Table 4 on page 58.

Table 19 indicates that 15.5 percent of the in-state freshmen were admitted with less than a 2.25 high school grade point average while the remaining 84.5 percent had a 2.25 or better. Table 20 shows that of those graduated within five years, only 7.1 percent were admitted with less than a 2.25 while 92.9 percent had a 2.25 or better. Clearly, high school grade point average was positively related to retention through graduation.

Similarly, Table 21 shows that 10.5 percent of the in-state freshmen were admitted with a composite ACT score of 16 or less while 89.5 percent had a composite ACT score of 17 or greater. Table 22 indicates that of those graduated within five full years, only 5.3 percent were admitted with a composite ACT score of 16 or less while 94.7 percent had a 17 or better. It is evident that composite ACT score was also positively related to retention through graduation.

The next nine tables all focus on those individuals admitted as in-state freshmen with a composite ACT score of 16 or lower. Table 23 indicates that 7.4 percent of those admitted as in-state freshmen with a composite ACT score of 16 or lower were also 21 years of age or older. Table 7 on page 60 shows that only 2.7 percent of all of the in-state

TABLE 19
 ADMISSIONS SUMMARY OF IN-STATE
 FRESHMEN BY HIGH SCHOOL
 GRADE POINT AVERAGE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
2.24 OR LOWER GPA	1.	2471	15.5	15.5	15.5
2.25 OR HIGHER GPA	2.	13486	84.5	84.5	100.0
	TOTAL	15957	100.0	100.0	

TABLE 20
 GRADUATION SUMMARY OF IN-STATE
 FRESHMEN BY HIGH SCHOOL
 GRADE POINT AVERAGE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
2.24 OR LOWER GPA	1.	449	7.1	7.1	7.1
2.25 OR HIGHER GPA	2.	5901	92.9	92.9	100.0
	TOTAL	6350	100.0	100.0	

TABLE 21
 ADMISSIONS SUMMARY OF IN-STATE
 FRESHMEN BY COMPOSITE
 ACT SCORE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
16 OR LOWER ACT	1.	1815	10.5	10.5	10.5
17 OR GREATER ACT	2.	15490	89.5	89.5	100.0
	TOTAL	17305	100.0	100.0	

TABLE 22
 GRADUATION SUMMARY OF IN-STATE
 FRESHMEN BY COMPOSITE
 ACT SCORE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
16 OR LOWER ACT	1.	354	5.3	5.3	5.3
17 OR GREATER ACT	2.	6352	94.7	94.7	100.0
	TOTAL	6706	100.0	100.0	

TABLE 23
AGE CLASSIFICATION OF IN-STATE
FRESHMEN WITH COMPOSITE ACT
SCORE OF 16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
21 OR OVER	1.	134	7.4	7.4	7.4
LESS THAN 21	2.	1681	92.6	92.6	100.0
	TOTAL	1815	100.0	100.0	

freshmen are 21 or older, indicating that proportionately greater numbers of older students were among those having low composite scores on the ACT.

Table 24 determined that of those in-state freshmen with a composite ACT score of 16 or lower, 39.2 percent were males and the remaining 60.8 percent were females. Table 9 on page 62 shows that 55.8 percent of all in-state freshmen admissions were males and 44.2 percent were females. Thus, females constituted a proportionately greater number of those students having low composite ACT scores.

Tables 25 and 26 indicate that percentages of in-state freshmen with a composite ACT score of 16 or less did not differ noticeably from the percentages of all in-state freshmen when compared on the basis of marital status or county wealth. Table 25 can be cross-referenced with Table 11 on page 63 for a comparison of marital status and Table 26 can be cross-referenced with Table 13 on page 64 for a comparison of county wealth.

Table 27 shows that 14.3 percent of those in-state freshmen admitted with a composite ACT score of 16 or less were black. Table 15 on page 67 shows that black students comprise 2.9 percent of the total number of in-state freshmen admissions indicating that black students constituted a proportionately greater number of those students admitted with low composite ACT scores.

Table 28 indicates that of those in-state freshmen admitted with a composite ACT score of 16 or less, that the College of Business enrolled 28.2 percent, Education enrolled 29.3 percent, Engineering enrolled only 1.7 percent, Agriculture enrolled 4.1 percent and the College of Liberal Arts enrolled 21.0 percent. Table 17 on page 68

TABLE 24
SEX CLASSIFICATION OF IN-STATE
FRESHMEN WITH COMPOSITE ACT
SCORE OF 16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
ALL FEMALES	1.	1103	60.8	60.8	60.8
ALL MALES	2.	712	39.2	39.2	100.0
	TOTAL	1815	100.0	100.0	

TABLE 25
 MARITAL STATUS CLASSIFICATION OF IN-STATE
 FRESHMEN WITH COMPOSITE ACT
 SCORE OF 16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
SINGLE STUDENTS	1.	1639	90.3	90.3	90.3
MARRIED STUDENTS	2.	176	9.7	9.7	100.0
	TOTAL	1815	100.0	100.0	

TABLE 26
 COUNTY WEALTH CLASSIFICATION OF
 IN-STATE FRESHMEN WITH
 COMPOSITE ACT SCORE
 OF 16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
LOW INCOME	1.	45	2.5	2.5	2.5
MEDIUM LOW INCOME	2.	121	6.7	6.7	9.2
MEDIUM HIGH INCOME	3.	256	14.1	14.1	23.3
HIGH INCOME	4.	1391	76.7	76.7	100.0
	TOTAL	1813	100.0	100.0	

TABLE 27
RACE CLASSIFICATION OF IN-STATE
FRESHMEN WITH COMPOSITE ACT
SCORE OF 16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
WHITE	1.	1412	77.8	77.8	77.8
BLACK	2.	200	14.3	14.3	92.1
OTHER	3.	143	7.9	7.9	100.0
	TOTAL	1815	100.0	100.0	

TABLE 28
COLLEGE ENROLLMENT CLASSIFICATION
OF IN-STATE FRESHMEN WITH
COMPOSITE ACT SCORE OF
16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
AGRICULTURE	1.	75	4.1	4.1	4.1
BUSINESS	2.	511	28.2	28.2	32.3
EDUCATION	3.	531	29.3	29.3	61.5
ENGINEERING	4.	30	1.7	1.7	63.2
LIBERAL ARTS	5.	382	21.0	21.0	84.2
OTHER COLLEGES	6.	286	15.8	15.8	100.0
	TOTAL	1815	100.0	100.0	

indicates that the College of Business enrolled 22.8 percent of all in-state freshmen, Education enrolled 18.2 percent, Engineering enrolled 7.2 percent, Agriculture enrolled 4.9 percent and the College of Liberal Arts enrolled 34.4 percent of all in-state freshmen. These differences show that proportionately greater numbers of students with a composite ACT score of 16 or less were originally enrolled in the College of Education and the College of Business while proportionately fewer numbers of students with low composite ACT scores were originally enrolled in the College of Engineering and the College of Liberal Arts. Percentages of students enrolled with composite ACT scores of 16 or less were proportionate to the percentage of total students enrolled only in the College of Agriculture.

Table 29 indicates that 25.8 percent of the in-state freshmen admitted with a composite ACT score of 16 or lower also had high school grade point averages of less than 2.25. Table 19 on page 70 determined that only 15.5 percent of all in-state freshmen had less than a 2.25 high school grade point average. Clearly, those students scoring low on the ACT also typically had lower high school grade point averages.

Only 19.5 percent of the in-state freshmen with a composite ACT score of 16 or less graduated within 20 consecutive quarters as determined by Table 30; 38.8 percent of all in-state freshmen graduated within this same time period as indicated by Table 4 on page 58. These figures indicate that those students admitted with low composite ACT scores were graduated in proportionately fewer numbers.

Table 31 indicates that only 9.2 percent of the in-state freshmen admitted with both a high school grade point average less than 2.25 and a composite ACT score of 16 or lower graduated within 20 consecutive

TABLE 29
HIGH SCHOOL GRADE POINT CLASSIFICATION
OF IN-STATE FRESHMEN WITH
COMPOSITE ACT SCORE OF
16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
2.24 OR LOWER GPA	1.	392	25.8	25.8	25.8
2.25 OR HIGHER GPA	2.	1129	74.2	74.2	100.0
	TOTAL	1521	100.0	100.0	

TABLE 30
GRADUATION PERCENTAGES OF IN-STATE
FRESHMEN WITH A COMPOSITE
ACT SCORE OF 16 OR LOWER

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.	354	19.5	19.5	19.5
NO	2.	1461	80.5	80.5	100.0
	TOTAL	1815	100.0	100.0	

TABLE 31

GRADUATION PERCENTAGES OF IN-STATE FRESHMEN WITH
 BOTH A COMPOSITE ACT SCORE OF 16
 OR LOWER AND A HIGH SCHOOL
 GRADE POINT AVERAGE OF
 LESS THAN 2.25

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.	36	9.2	9.2	9.2
NO	2.	356	90.8	90.8	100.0
	TOTAL	392	100.0	100.0	

quarters. Table 4 on page 58 indicates that 38.8 percent of all in-state freshmen graduated within 20 consecutive quarters. Students with both low high school grade point averages and low composite ACT scores are definitely high risk students with a mere 9.2 percent of these students persisting to graduation within the five year period.

IV. PATTERN OF PERSISTENCE AND PATTERN OF GRADUATION OF ALL IN-STATE FRESHMEN

The third research question determined the pattern of persistence and the pattern of graduation of all in-state freshmen. Figure 1 graphically illustrates the pattern of persistence of all in-state freshmen for 20 consecutive quarters. The greatest attrition occurred during the first academic year. The low points at quarters 4, 8 and 12 were a result of the substantial enrollment reduction which occurred during each of the summer quarters.

Figure 2 graphically illustrates the pattern of graduation of all in-state freshmen. A very few students were graduated within 12 quarters or 3 years of admissions while the bulk of the students were graduated on schedule, 4 academic years or 15 quarters from their respective dates of admissions. Another group of students were graduated 5 academic years or 19 quarters from their respective dates of admissions.

V. CATEGORICAL ANALYSIS OF PERSISTENCE AND GRADUATION PATTERNS OF IN-STATE FRESHMEN

The fourth research question determined the persistence and graduation patterns of in-state freshmen within each of the classifications specified: age, sex, marital status, county wealth, race,

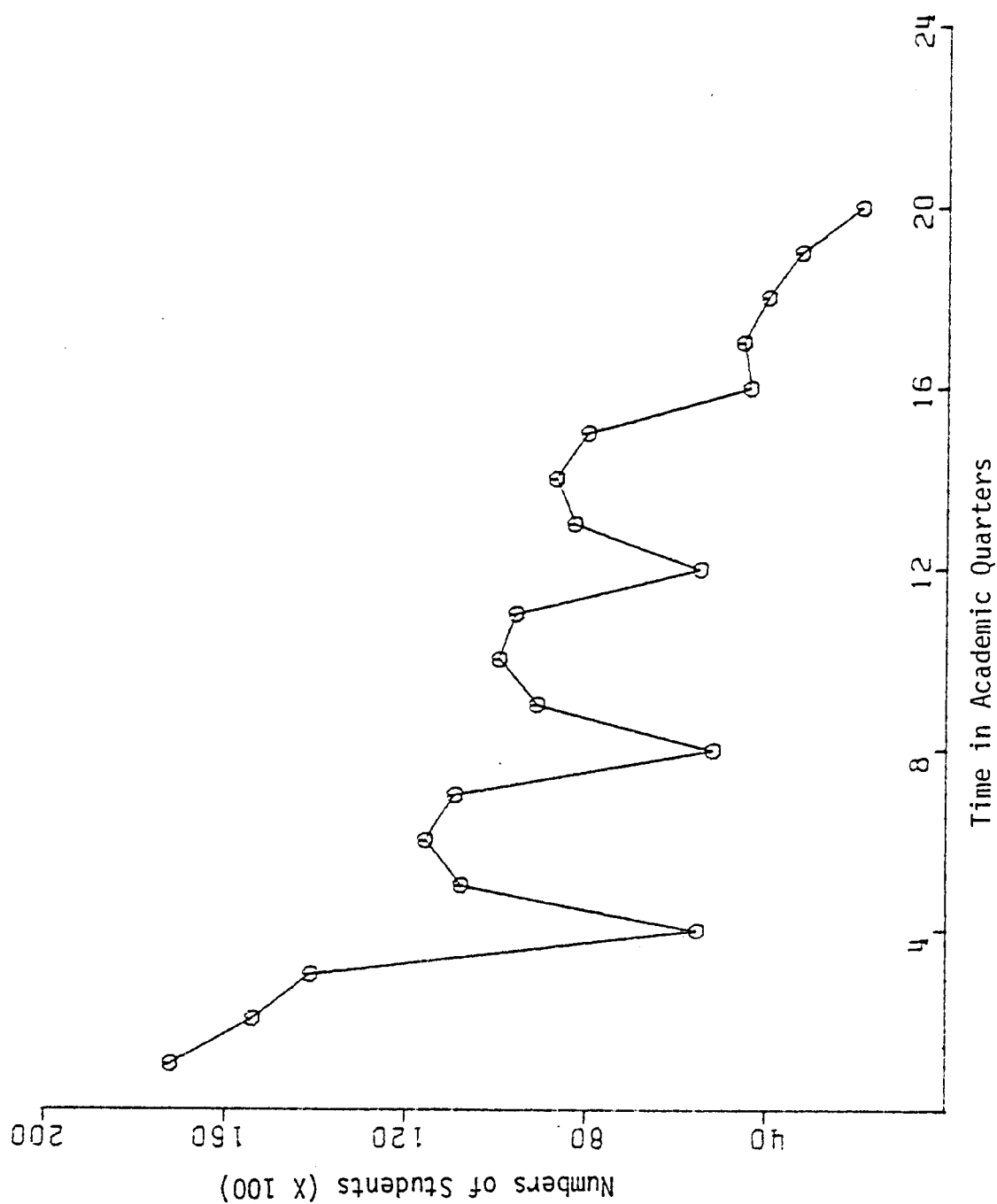


Figure 1. Persistence pattern of all in-state freshmen.

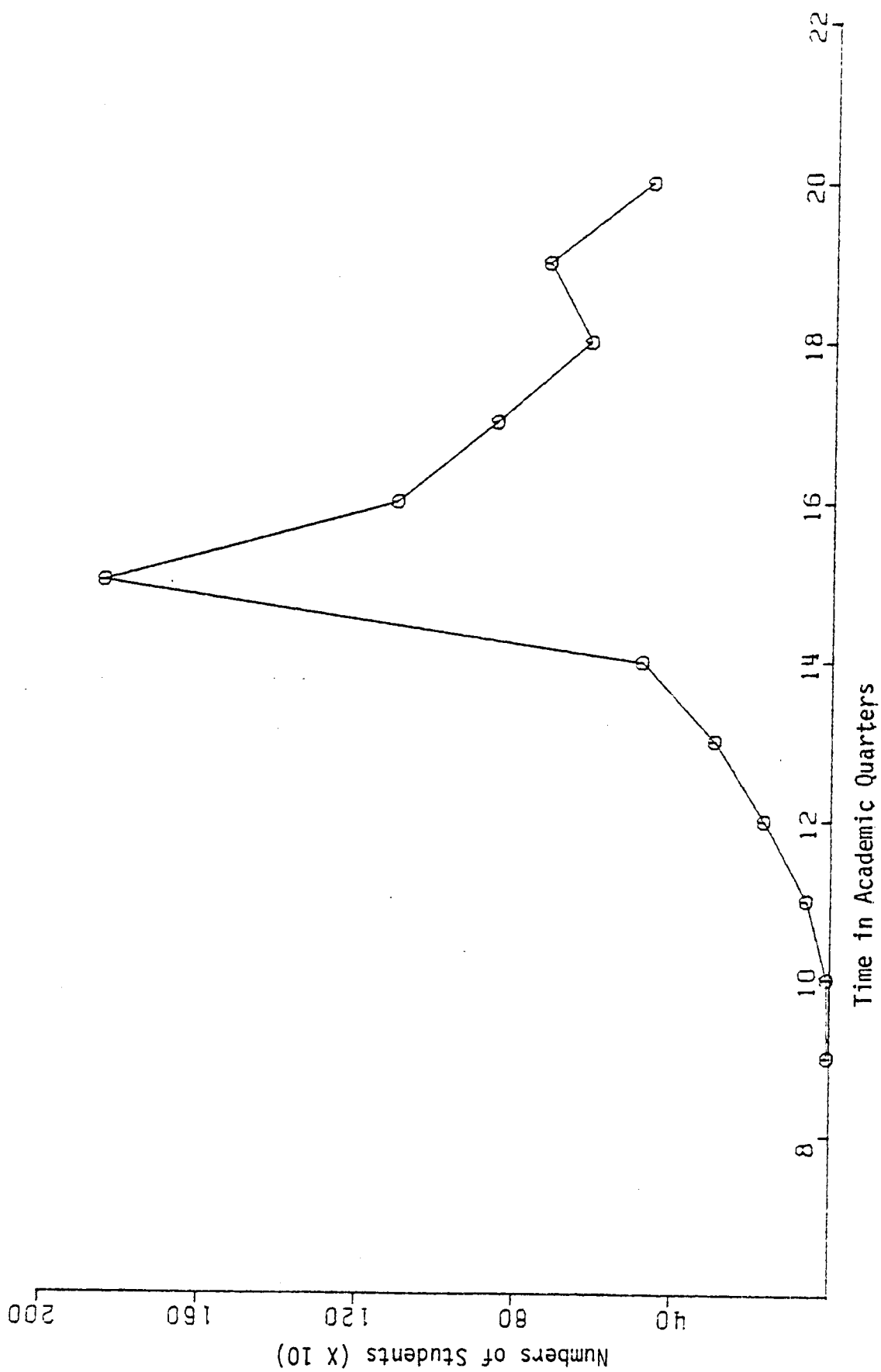


Figure 2. Graduation pattern of all in-state freshmen.

college enrolled, high school grade point average and composite ACT score. Figure 3 graphically illustrates the pattern of persistence by age of those students admitted as in-state freshmen. Figure 4 illustrates the pattern of graduation by age. The relatively small number of students originally admitted who were 21 years of age or older at their respective dates of admissions complicated this comparison.

Figure 5 graphically illustrates the pattern of persistence by sex of individuals admitted as in-state freshmen. Figure 6 illustrates the pattern of graduation by sex. Females tended to graduate earlier or exactly on schedule proportionately more frequently than did males. The graduation pattern of males suggests that males took slightly longer to complete their academic program and almost exclusively constituted the enrollment in the five year academic programs.

The pattern of persistence by marital status of those students admitted as in-state freshmen is graphically illustrated by Figure 7. Figure 8 illustrates the pattern of graduation by marital status. The relatively small numbers of students who were married at date of admissions complicated this comparison.

Figure 9 graphically illustrates the pattern of persistence by county wealth of those individuals admitted as in-state freshmen. Figure 10 illustrates the pattern of graduation by county wealth. Again, the relatively unequal distribution of individuals among counties complicated the analysis of these two figures.

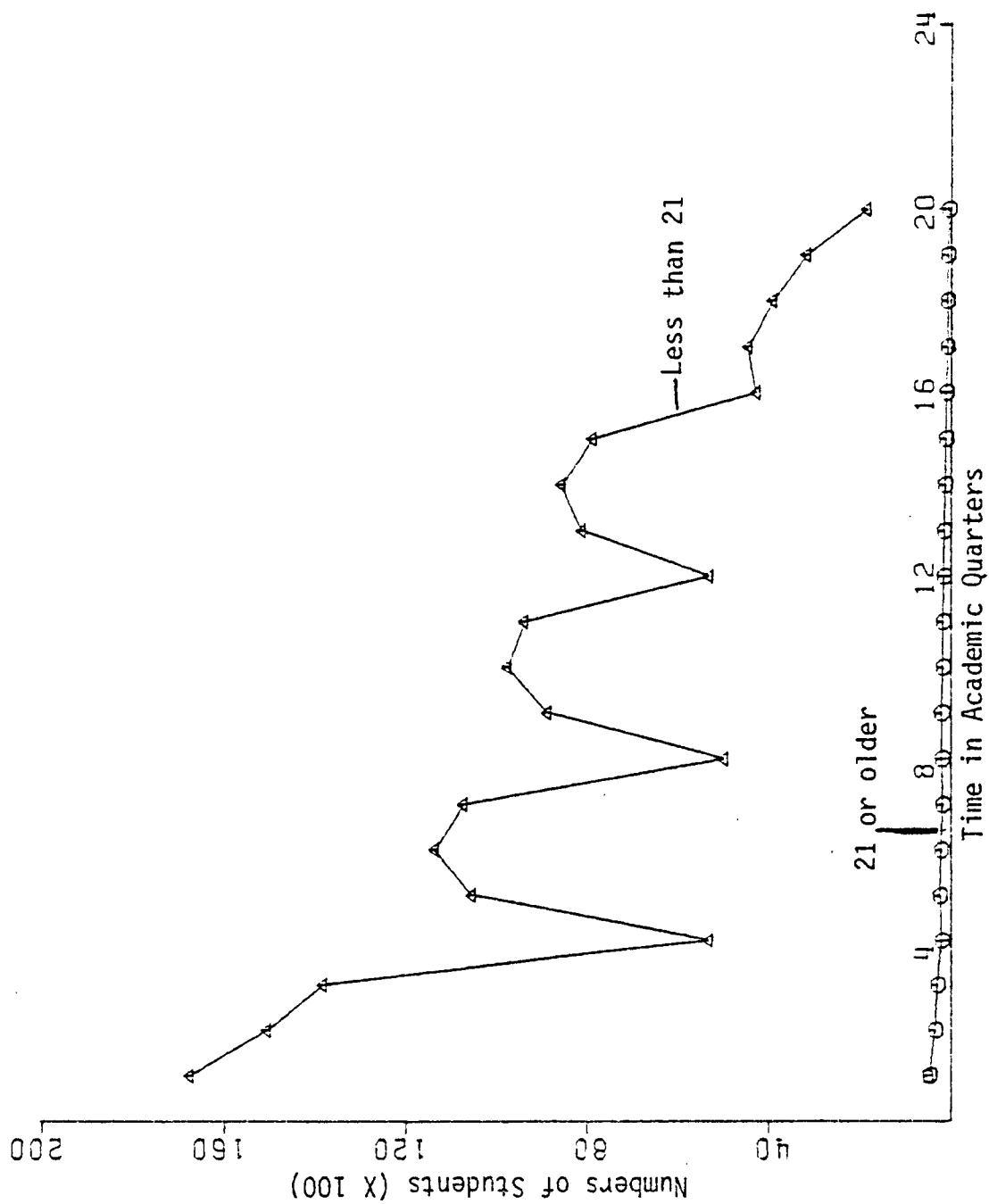


Figure 3. Persistence pattern by age.

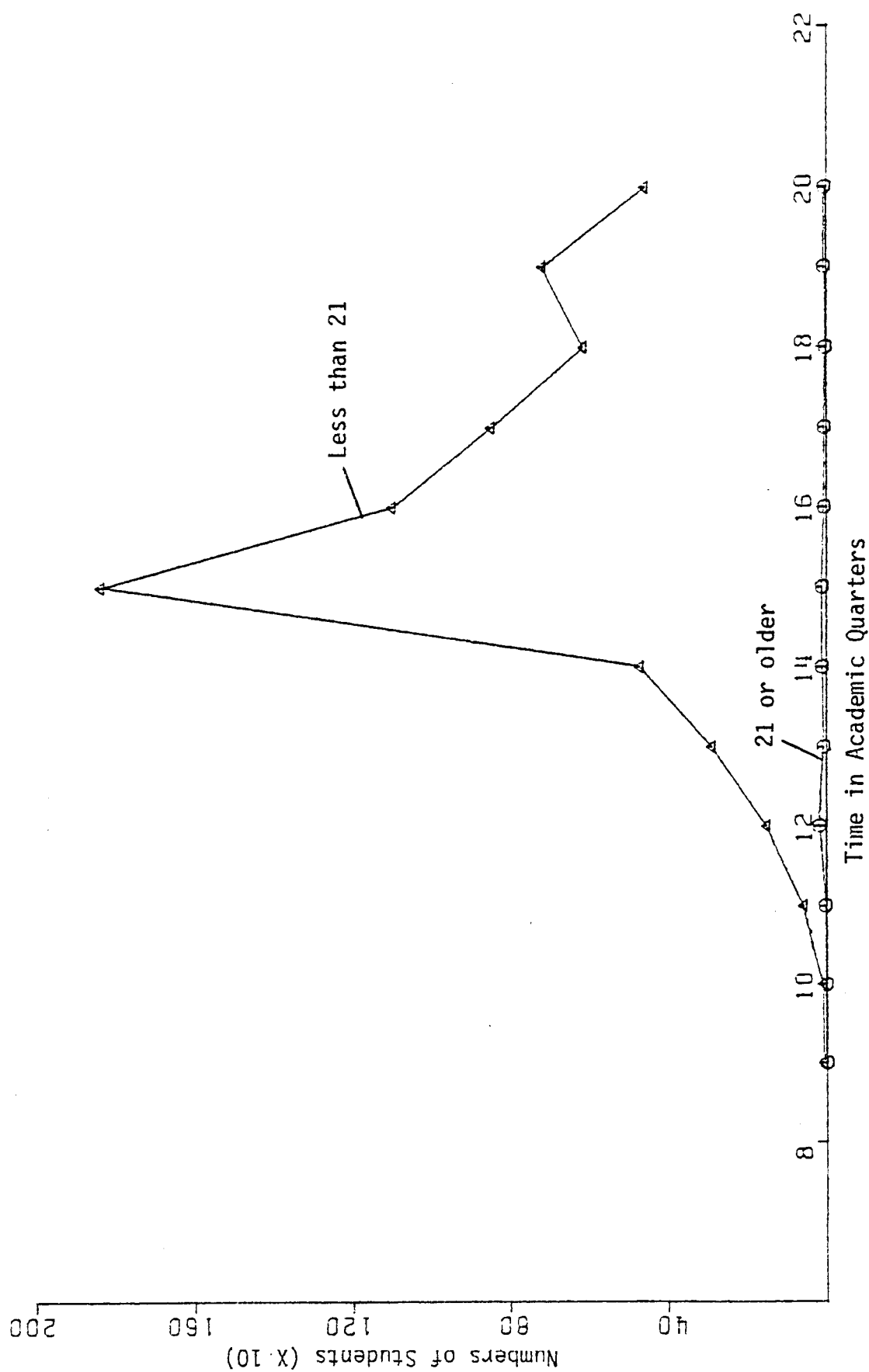


Figure 4. Graduation pattern by age.

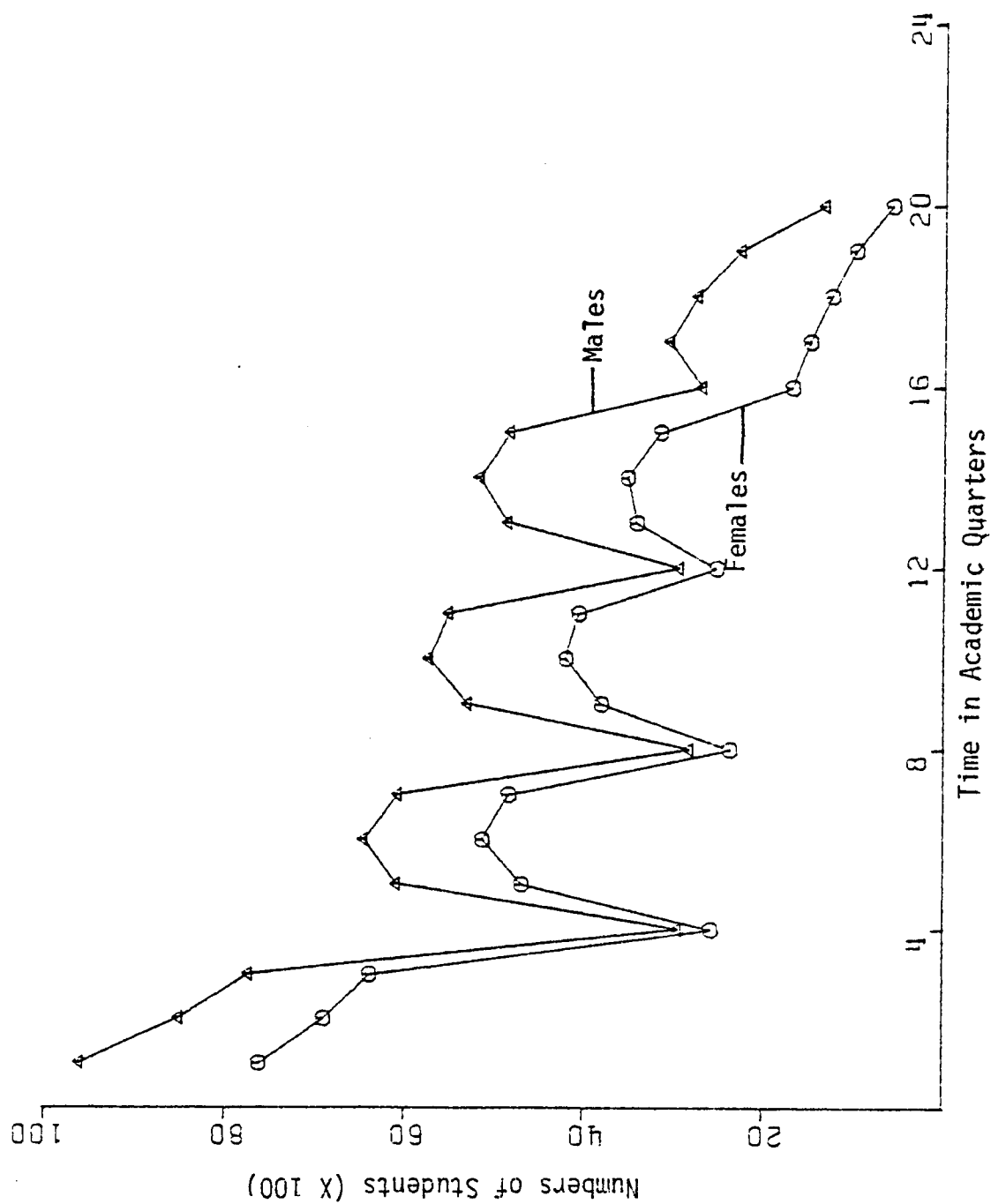


Figure 5. Persistence pattern by sex..

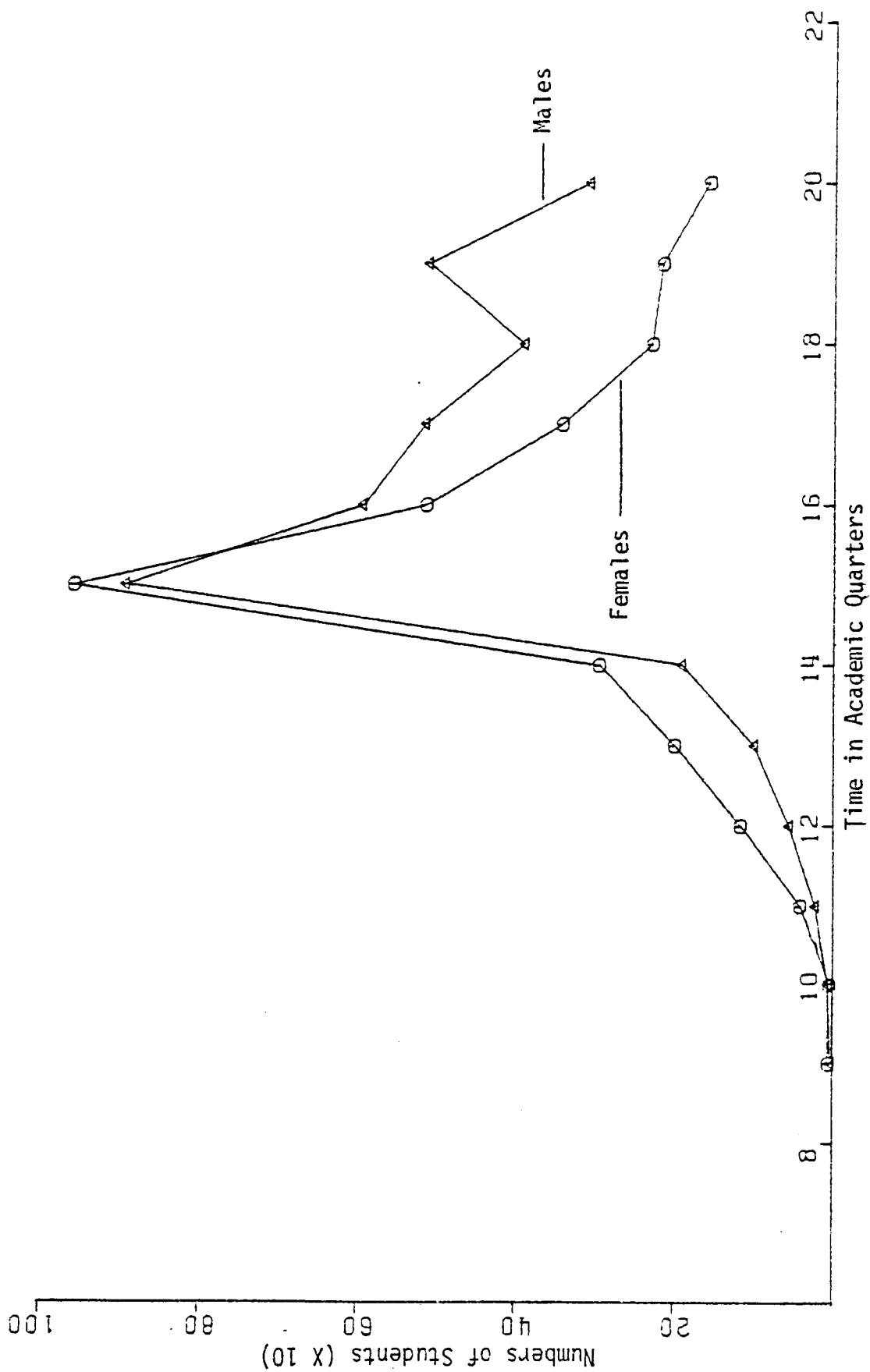


Figure 6. Graduation pattern by sex.

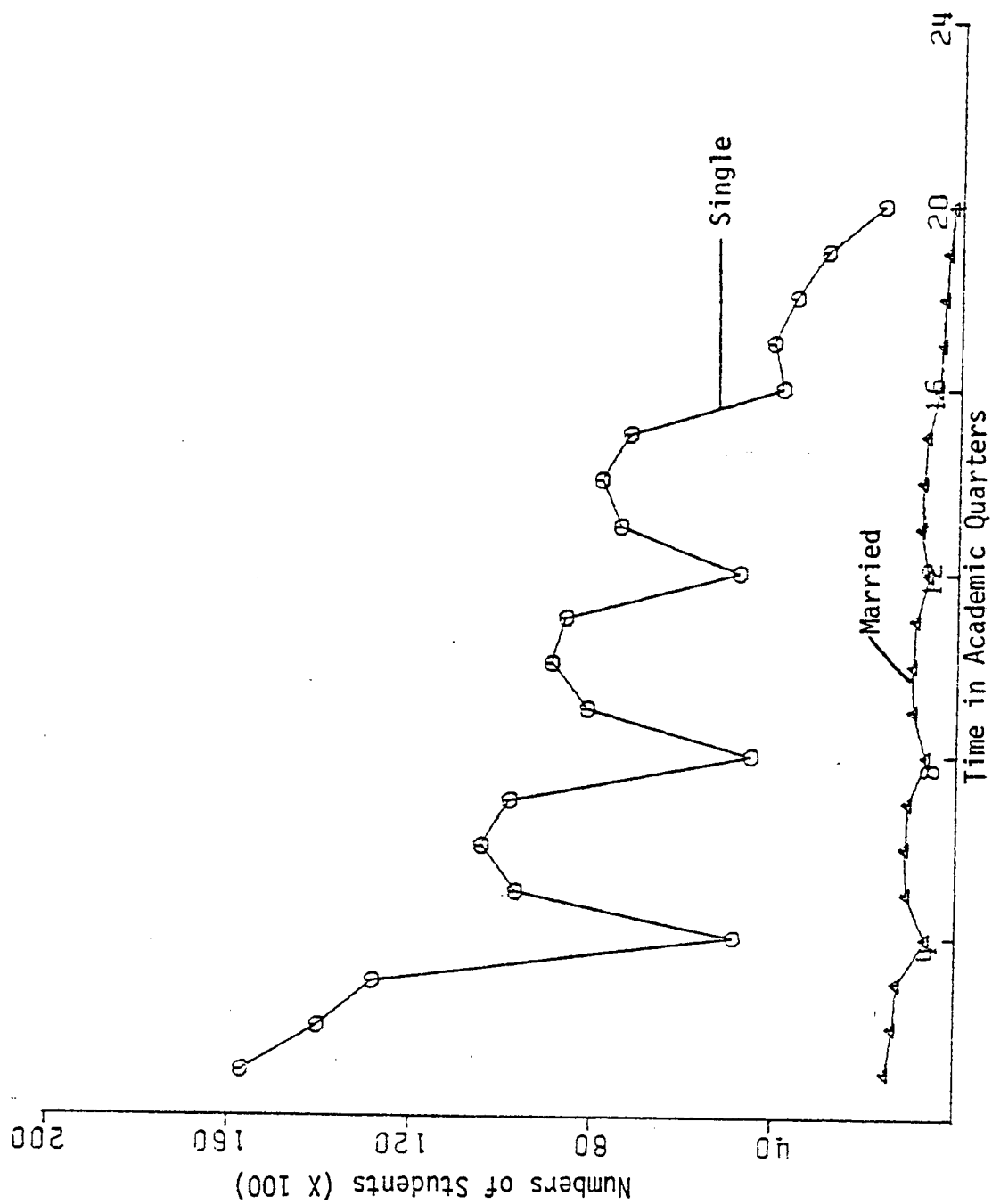


Figure 7. Persistence pattern by marital status.

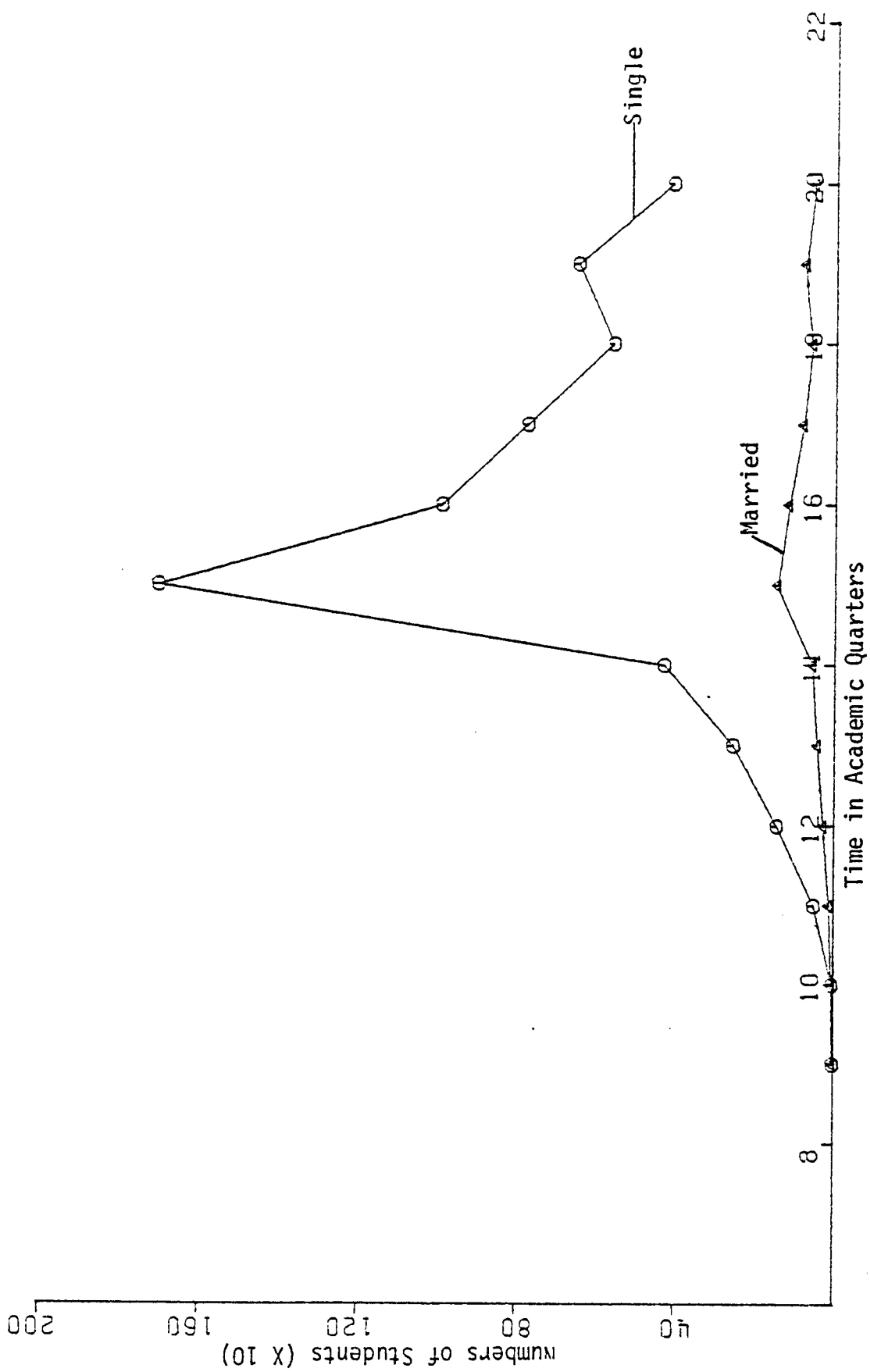


Figure 8. Graduation pattern by marital status.

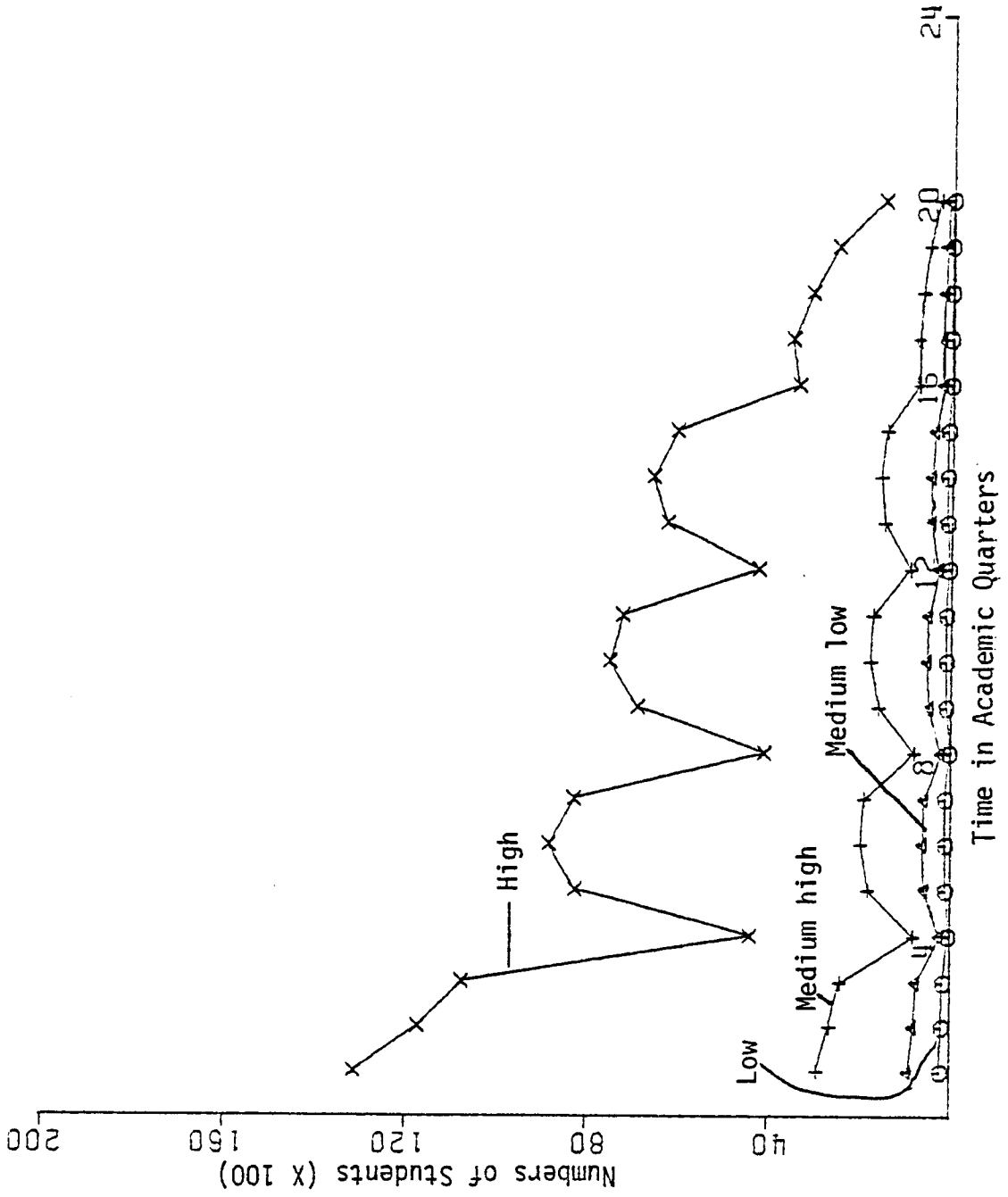


Figure 9. Persistence pattern by county wealth.

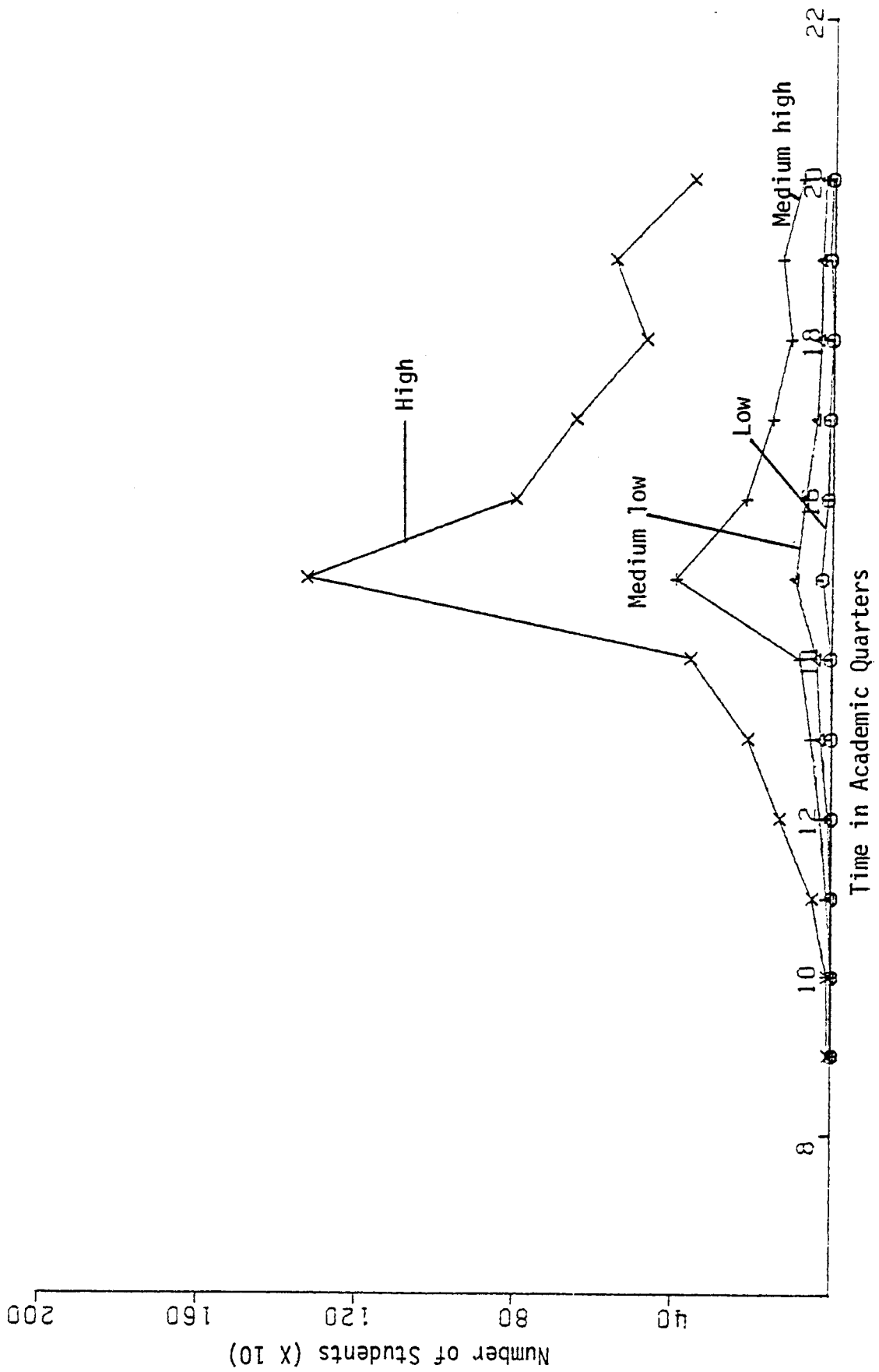


Figure 10. Graduation pattern by county wealth.

The pattern of persistence by race of those students admitted as in-state freshmen is graphically illustrated by Figure 11. Figure 12 illustrates the pattern of graduation by race. The relatively small numbers of black students admitted as in-state freshmen during the five year period under study negated the value of this comparison.

Figure 13 graphically illustrates the pattern of persistence of students by college of initial enrollment. Figure 14 illustrates the pattern of graduation of students by college of initial enrollment. Many students had changed colleges and thus were no longer students in their respective college of initial enrollment which requires the cautions utilization of this comparison. The patterns of persistence by college of enrollment were quite similar; however, patterns of graduation were noticeably different. Virtually no students originally enrolled in the College of Engineering graduated ahead of schedule; a few were graduated during the fourth academic year, but most individuals graduated at the end of the fifth academic year. This graduation "peak" of students originally enrolled in the College of Engineering in the 19th quarter from date of enrollment accounts for the similar graphic distributions previously noted in the discussion and represented in Figure 4 on page 85 and Figure 6 on page 87. Individuals originally enrolled in the College of Liberal Arts and the College of Education tended to graduate on schedule more frequently than students originally enrolled in other colleges. Students originally enrolled in the College of Business took relatively longer to graduate than students originally enrolled in any other academic college.

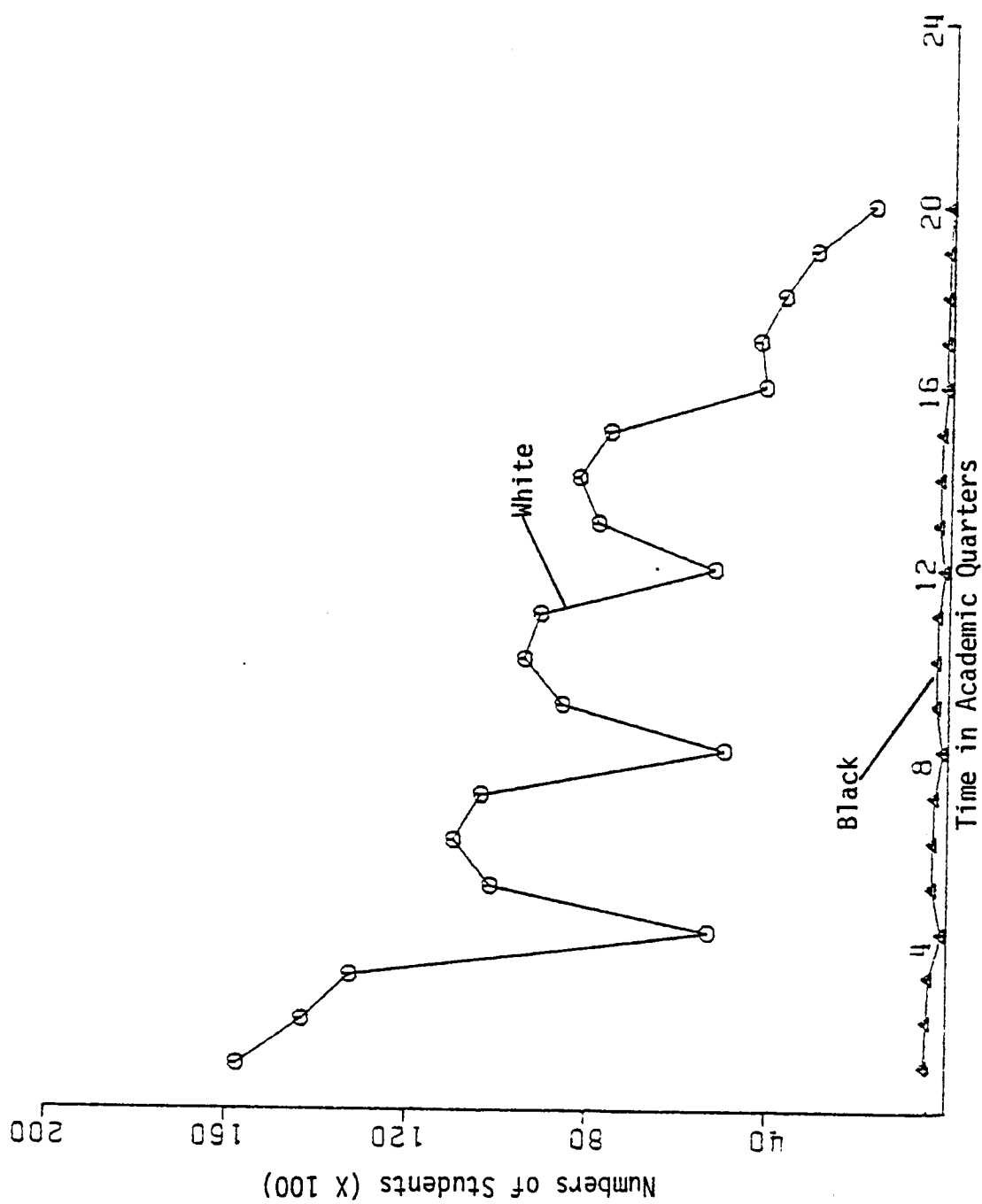


Figure 11. Persistence pattern by race.

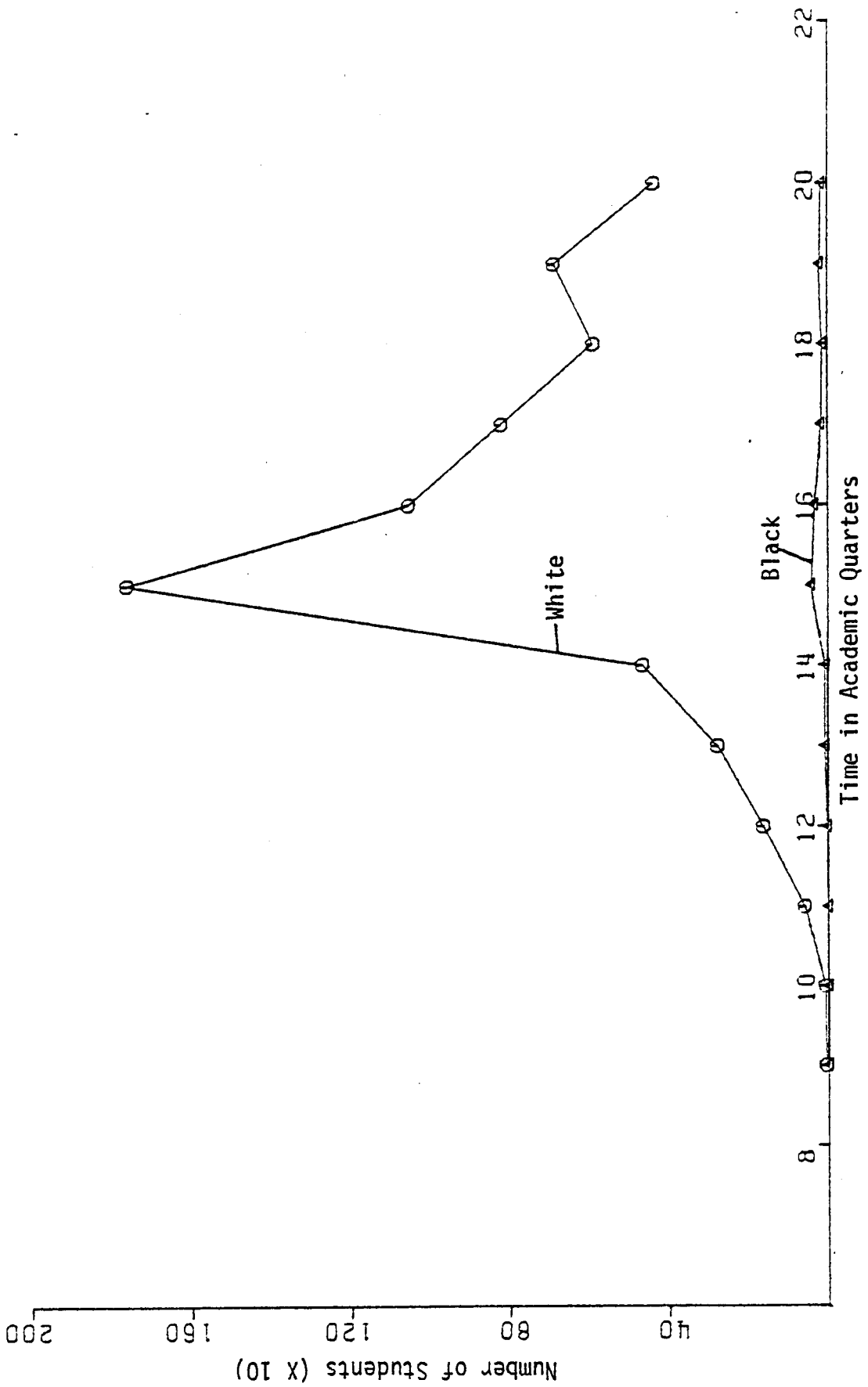


Figure 12. Graduation pattern by race.

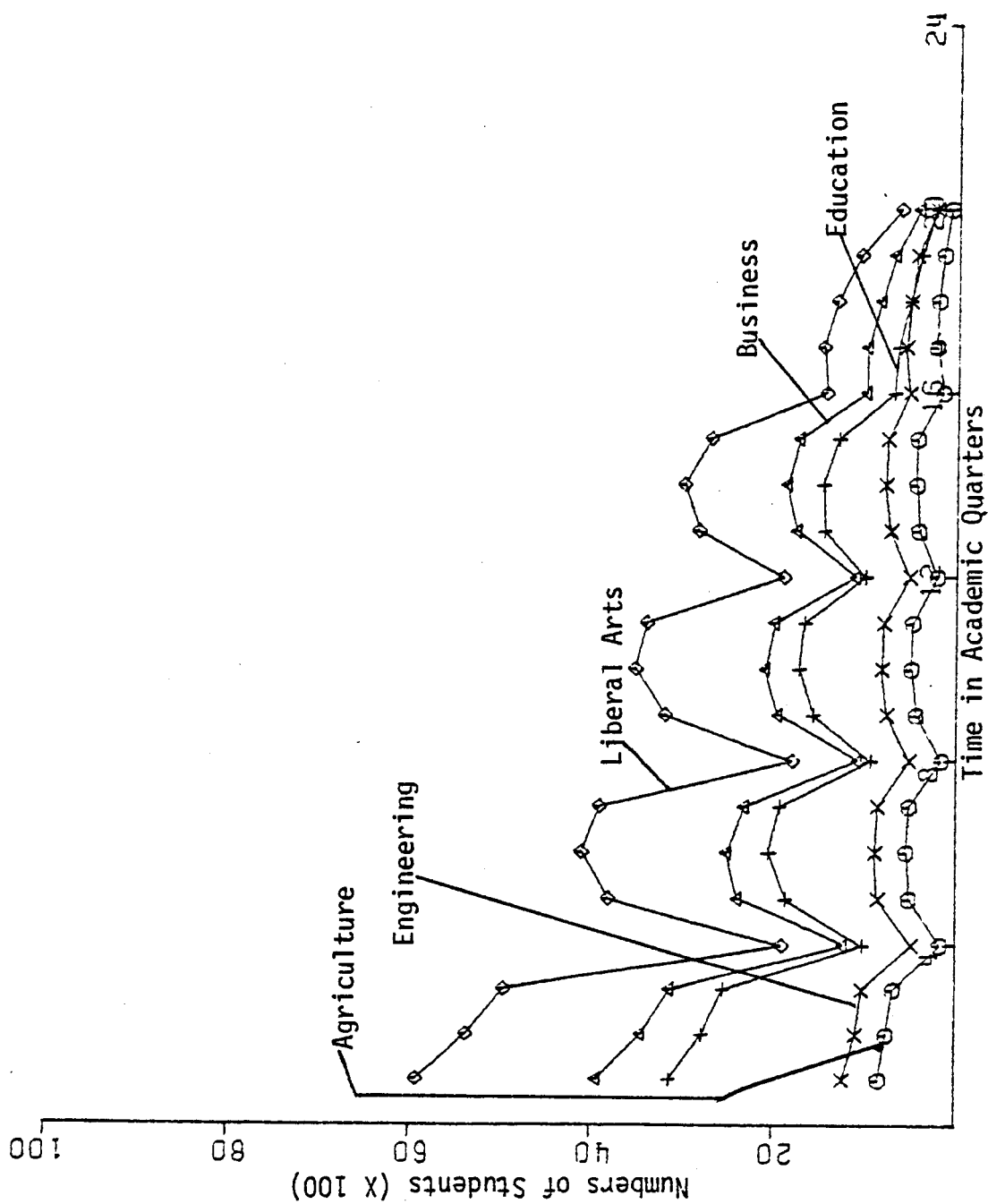


Figure 13. Persistence pattern by college of original enrollment.

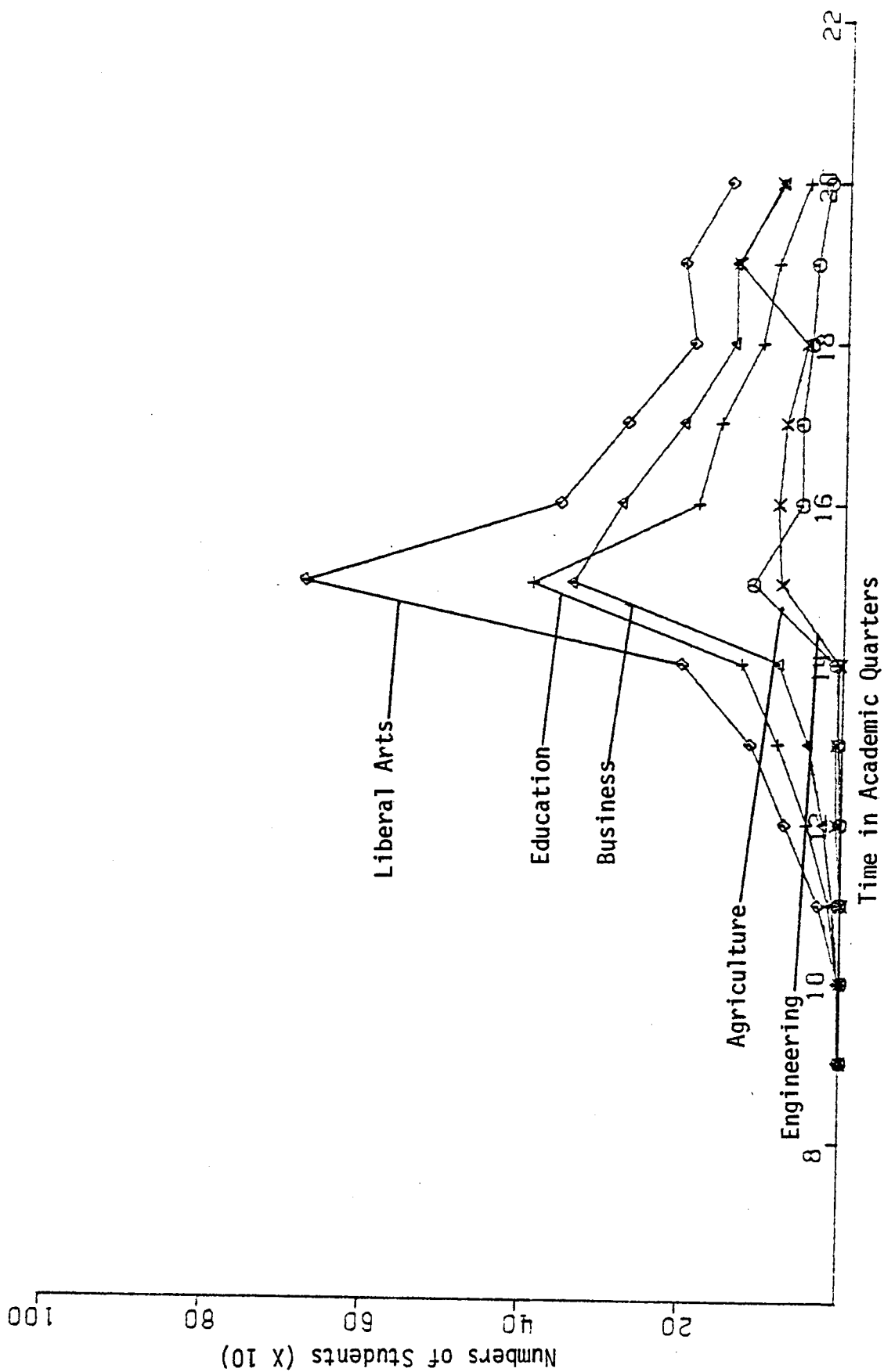


Figure 14. Graduation pattern by college of original enrollment.

Figure 15 graphically illustrates the pattern of persistence by high school grade point average of those students admitted as in-state freshmen. Figure 16 illustrates the pattern of graduation by high school grade point average. The relatively small numbers of students admitted with low high school grade point averages during the five year period under study negated the pictorial value of this comparison.

The pattern of persistence by composite ACT score of those students admitted as in-state freshmen is graphically illustrated in Figure 17. Figure 18 illustrates the pattern of graduation by composite ACT score of these same students. The relatively small numbers of students admitted with low composite ACT scores during the five year period under study also negated the value of this comparison.

VI. PREDICTABILITY OF GRADUATION

The fifth research question concerned the a priori ability to predict on an individual basis the probability of graduation of those students admitted as in-state freshmen. Composite ACT score, high school grade point average and county wealth were identified as variables to be included in the analysis. A discriminant analysis was conducted to answer this question. Composite ACT score and high school grade point average were both positively and significantly related to graduation while the county wealth variable did not significantly improve graduation predictions. High school grade point average proved to be the single best predictor of graduation; composite ACT score also added significantly to the graduation prediction. Utilizing only these two variables, it was possible to correctly classify on an individual

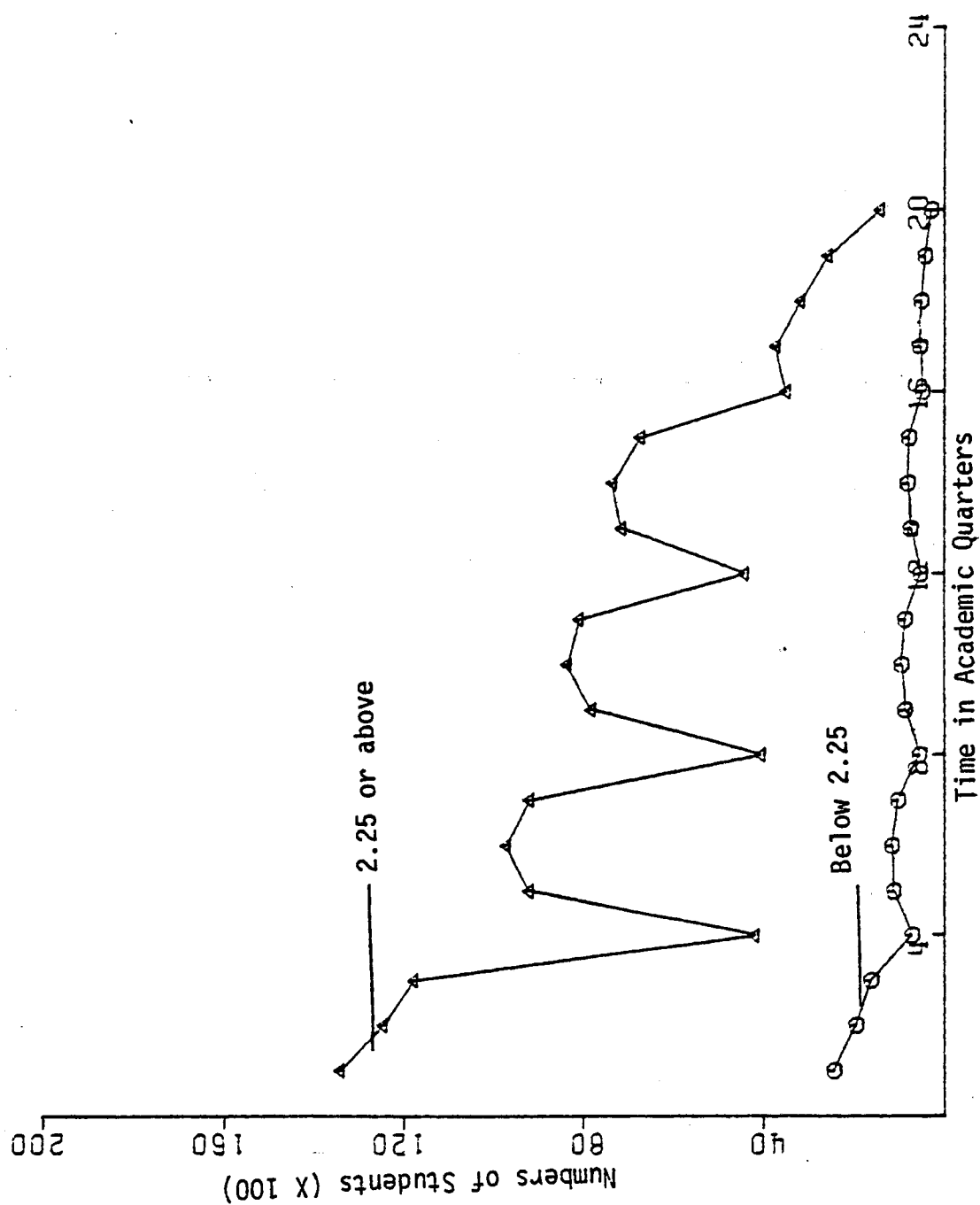


Figure 15. Persistence pattern by high school grade point average.

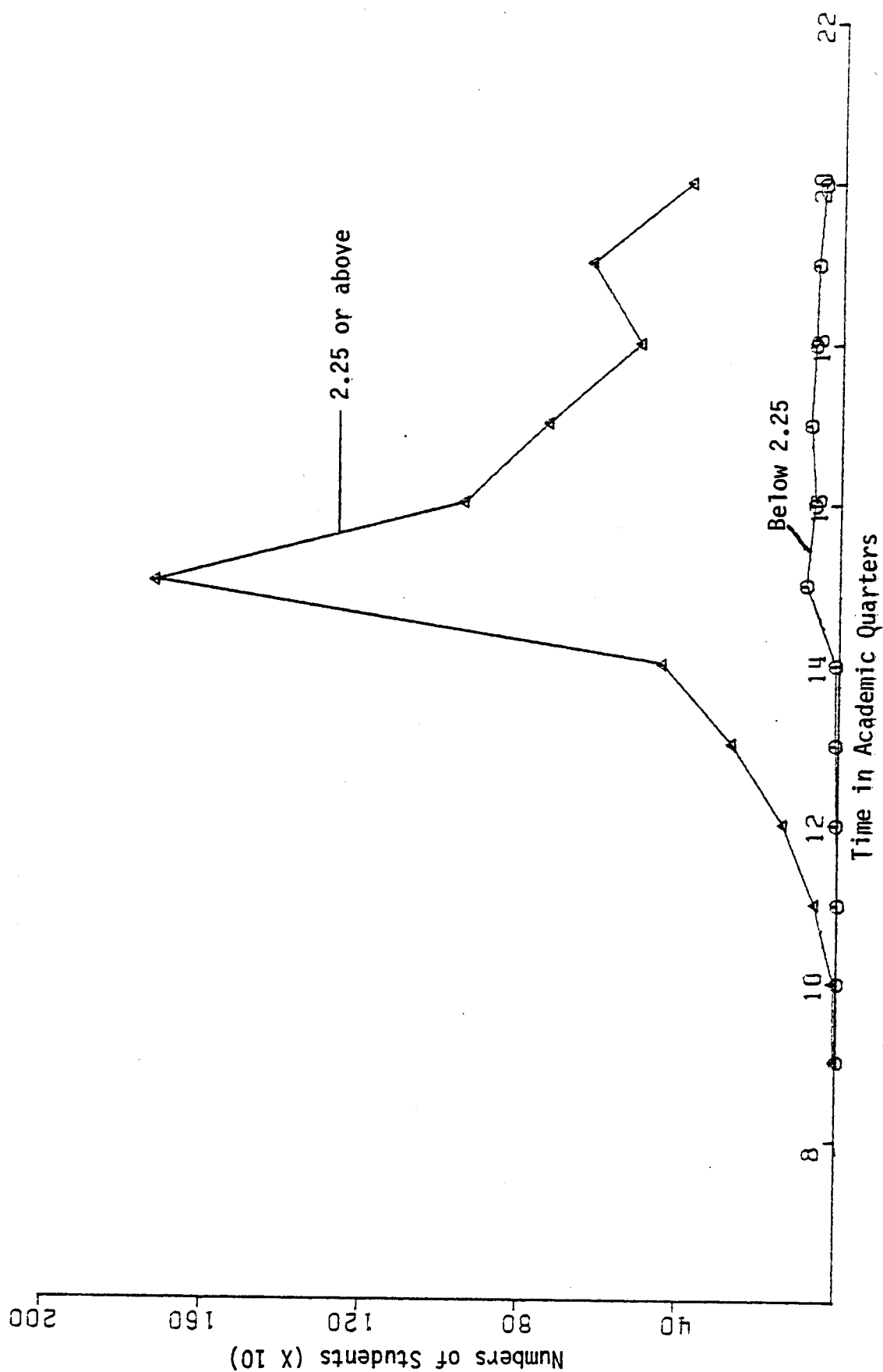


Figure 16. Graduation pattern by high school grade point average.

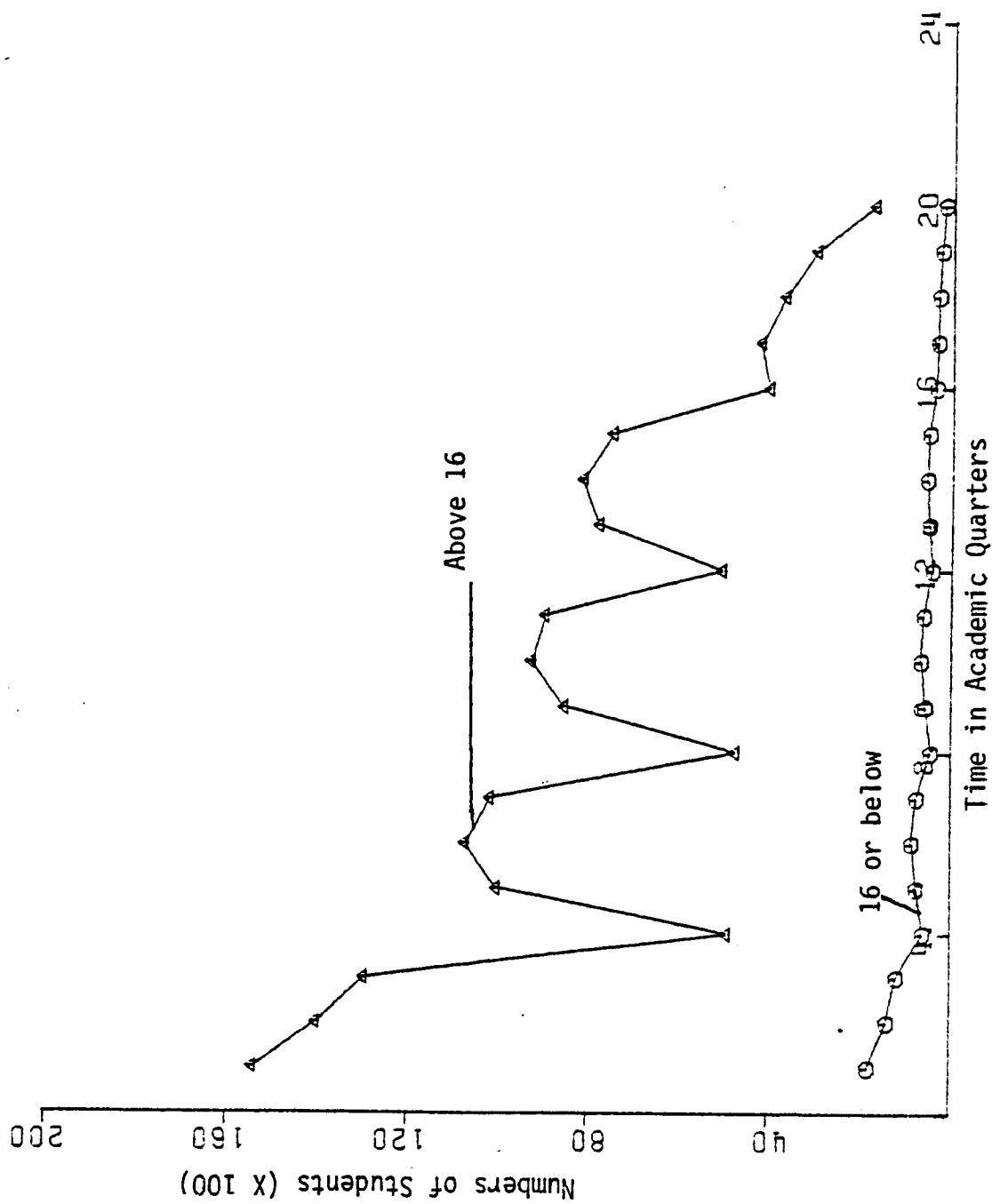


Figure 17. Persistence pattern by composite ACT score.

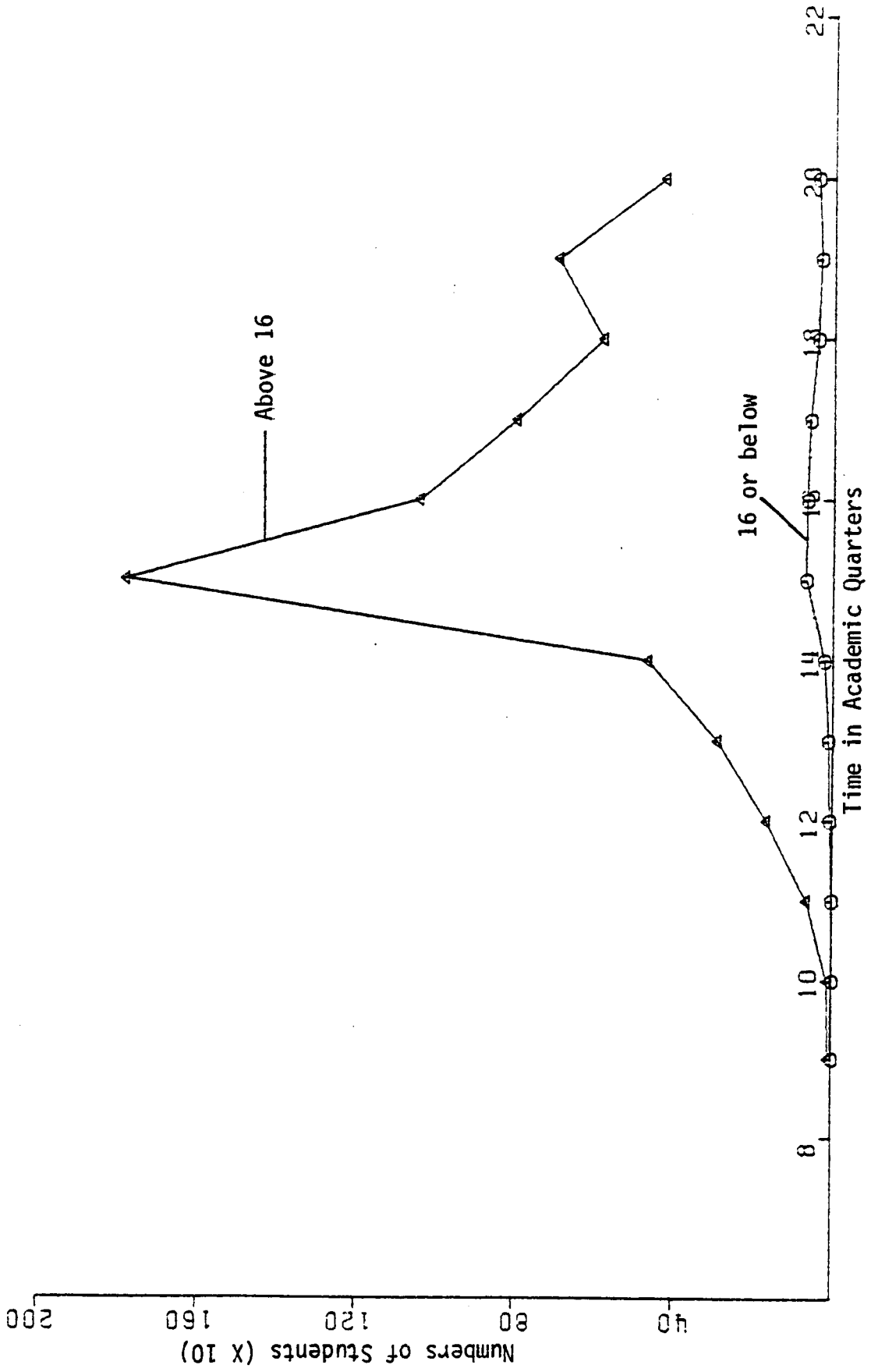


Figure 18. Graduation pattern by composite ACT score.

basis 63.4 percent of all in-state freshmen as future graduates or non-graduates at their respective dates of admissions.

VII. GRADE POINT AVERAGES OF THOSE STUDENTS NOT GRADUATED

The sixth and final research question determined the cumulative grade point averages of all students admitted as in-state freshmen who failed to graduate within five academic years or 20 consecutive quarters. Table 32 reveals that 56.0 percent of those students not graduating within five years had better than a 2.00 cumulative grade point average at the time they left The University of Tennessee, Knoxville. As academic retention standards allow some individuals to remain in school with less than 2.00 grade point average, well over one-half of the students leaving The University of Tennessee, Knoxville before completing a baccalaureate degree departed in good academic standing.

TABLE 32
 CUMULATIVE COLLEGE GRADE POINT AVERAGES
 AS OF LAST QUARTER IN ATTENDANCE
 OF NONGRADUATING IN-STATE
 FRESHMEN

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
0.99 OR LOWER	1.	1444	13.7	13.7	13.7
1.00 TO 1.99	2.	3197	30.3	30.3	44.0
2.00 TO 2.99	3.	4403	41.8	41.8	85.8
3.00 OR HIGHER	4.	1492	14.2	14.2	100.0
	TOTAL	10536	100.0	100.0	

CHAPTER V

SUMMARY, FINDINGS, DISCUSSION, AND RECOMMENDATIONS

I. INTRODUCTION

This chapter is organized into four sections. The introduction serves as section one and the second section summarizes the study. The findings in terms of the research questions are presented in the third section. The discussion related to these findings and recommendations for further research are found in the fourth section.

II. SUMMARY OF THE STUDY

Statement of the Problem

The University of Tennessee, Knoxville has established a number of task forces and committees to determine means of increasing the retention of students through graduation without compromising the quality of education. The committees were appointed in response to the enrollment decline which has been adversely affecting the financial status of The University of Tennessee, Knoxville in that institutional income is directly proportional to enrollment. The problem is that the effectiveness and impact of these committees and the programs subsequently developed may be limited without adequate historical information of the attrition and graduation rates of the various categories of students being served by The University of Tennessee, Knoxville.

Purpose of the Study

The purposes of this study were: to provide administrators, faculty, and staff at The University of Tennessee, Knoxville with information concerning the retention and attrition rates and the persistence and graduation patterns of all in-state freshmen; to focus attention on the retention rate of marginally qualified in-state freshmen; to make recommendations which may assist in the development, implementation and maintenance of retention programs; and to identify areas in need of additional or more specific research.

Research Questions

1. Of the in-state freshmen enrolled at The University of Tennessee, Knoxville from Fall Quarter, 1968 through Summer Quarter, 1973, what percent graduated from The University of Tennessee, Knoxville within 20 consecutive quarters from their respective dates of admissions?
2. Classifying these same students at time of enrollment by race, sex, marital status, composite ACT score, high school cumulative grade point average, county wealth, enrolled college or age, what were the percentages of students enrolled in each category in comparison with the percentages of students graduated in each category within 20 consecutive quarters from their respective dates of enrollment?
3. What was the pattern of persistence and the pattern of graduation in academic quarters as determined by the numbers in attendance each subsequent quarter for 20 consecutive quarters?
4. Did the pattern of persistence or the pattern of graduation in academic quarters of these students differ when graphically compared on the basis of race, sex, marital status, composite ACT score, high

school cumulative grade point average, county wealth, enrolled college or age?

5. At date of enrollment, could the combination of composite ACT score, high school cumulative grade point average, and county wealth have accurately predicted persistence through graduation on an individual basis?

6. Of the in-state freshmen enrolled but not graduated within 20 consecutive quarters, what percent had a 2.00 or higher cumulative grade point average at the end of their last quarter in attendance?

Methodology

It was necessary to use a variety of computer procedures to generate a master tape containing the information needed in this analysis. Basically, the computer information available on every in-state freshman admitted from Fall Quarter of 1968 through Summer Quarter of 1973 with a composite ACT score as part of their individual record was selected for analysis. Chapter III presents a detailed description of these procedures.

A cumulative five year record was generated on every individual identified for analysis. Thus, the individual information available for analysis consisted of student identification number, quarter and year of enrollment, composite ACT score, high school cumulative grade point average, home county, sex, marital status, race, date of birth, college of initial enrollment, university graduation date, cumulative college grade point average, and enrollment status for 20 consecutive quarters.

The resulting computer file tape consisted of individual information on 17,305 in-state freshmen from this five-year period. The sample selected through the process described was considered more than sufficient not only for making inferences about the total group or entire population of individuals originally admitted as in-state freshmen during this five-year period but also for conceptualizing the probable persistence patterns of in-state freshmen who have subsequently been admitted.

The data were analyzed descriptively by the computer providing frequency and percentage of individuals in each of the eight biographic or demographic categories: race, sex, marital status, composite ACT score, high school cumulative grade point average, county wealth, enrolled college and age. In addition, the descriptive analysis was further supplemented by comparatively graphing the persistence patterns for 20 consecutive quarters of the students in these same categories. Stepwise discriminant analysis was utilized as a classification technique for predicting the probability of graduation.

III. FINDINGS

The findings relate to each of the six research questions.

1. The study found that 38.8 percent of all in-state freshmen admitted from Fall Quarter of 1968 through Summer Quarter of 1973 graduated within 20 consecutive quarters from their respective dates of admissions.

2. The research determined that of all individuals admitted during these five years as in-state freshmen, 97.3 percent were under

21 years of age, 91.2 percent were not married, 91.4 percent were white, 84.5 percent had a high school grade point average of 2.25 or higher, 89.5 percent had a composite ACT score greater than 16, and 55.8 percent were males while the remaining 44.2 percent were females.

The research determined the comparative composition of those graduated within 20 consecutive quarters and found that 98.1 percent were under 21 years of age at their respective dates of admissions, 89.6 percent were not married when admitted, 95.4 percent were white, 92.9 percent had a 2.25 or higher high school grade point average at date of admissions, 94.7 percent had better than a 16 composite ACT score, and 53.7 percent were males while the remaining 46.3 percent were females.

The similar comparison of percentages by college of initial enrollment determined that college of original enrollment did not disproportionately affect an individual's chances of graduation with the possible exception of the College of Business. Only 34.4 percent of the in-state freshmen originally enrolled in the College of Business persisted through graduation in five years in comparison to the 38.8 percent rate for all in-state freshmen.

Negligible differences were found when similar comparisons were made utilizing the county wealth variable.

Of all individuals admitted with a composite ACT score of 16 or less, only 19.5 percent persisted to graduation. Also, of all individuals admitted with both a composite ACT score of 16 or less and a high school grade point average of less than a 2.25, only 9.2 percent persisted to graduation within 20 consecutive quarters.

3. The research determined that the greatest attrition of the students admitted as in-state freshmen occurred during the first academic

year. The largest portion of the students were graduated on schedule, four academic years or 15 academic quarters from their respective dates of admissions.

4. Concerning persistence and graduation patterns, females tended to graduate earlier or exactly on schedule proportionately more frequently than did males.

Individuals originally enrolled in the College of Liberal Arts and the College of Education tended to graduate on schedule more frequently than students in other colleges. Students originally enrolled in the College of Business took relatively longer to graduate than students originally enrolled in any other college. Virtually no students graduated ahead of schedule if originally enrolled in the College of Engineering; a few were graduated during the fourth academic year, but most individuals originally enrolled in the College of Engineering graduated exactly on schedule at the end of the fifth academic year in accordance with that college's five-year programs.

The rather homogenous composition of the in-state freshmen complicated the comparison of persistence and graduation patterns on the basis of age, marital status, county wealth, high school grade point average, composite ACT score, and race.

5. The research determined that composite ACT score and high school grade point average were both positively and significantly related to graduation while the county wealth variable did not significantly improve graduation predictions. High school grade point average proved to be a single best predictor of graduation from The University of Tennessee, Knoxville; however, composite ACT score did add significantly

to the graduation prediction. Utilizing only these two variables, it was possible to correctly classify on an individual basis 63.4 percent of all in-state freshmen as future graduates or non-graduates at their respective dates of admissions.

6. The research determined that 56.0 percent of those students not graduated within five years had better than a 2.00 cumulative grade point average at the time they left The University of Tennessee, Knoxville.

IV. DISCUSSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

The remarkable homogeneity of the composite group of in-state freshmen admitted from Fall Quarter of 1968 through Summer Quarter, 1973 minimized the usefulness of portions of the research. The in-state freshmen were primarily traditional students: under 21 years of age, white, unmarried, academically talented, and from relatively higher socioeconomic backgrounds.

The clientele of The University of Tennessee, Knoxville is considerably more diverse today than it was five years ago; this institution must be sensitive to the needs of the non-traditional student in a university that has built its programs and services around the traditional college student. As the student population rapidly diversifies, so must the academic programs and associated services if this institution intends to meet the needs of these "new" students.

The retention record of The University of Tennessee, Knoxville has been considered "good." Of the individuals admitted as in-state freshmen, 38.8 percent graduated within five academic years; 40 percent is considered to be the comparable national average. In fact, of those

students in the study with ten years of academic records accessible, 48.4 percent graduated within a decade of their respective admissions dates which is considered "excellent" by any comparable standard.

However, care must be exercised to prevent distinct subpopulations from being lost in the averages obtained by measuring the masses. The marginal students provide one notable example. Although 38.8 percent of all in-state freshmen persisted to graduation within five years, only 19.5 percent of those admitted with a composite ACT score of 16 or less persisted to graduation. And, of the individuals admitted with both a composite ACT score of 16 or less and a high school grade point average of less than 2.25, a mere 9.2 percent persisted to graduation in five years.

Approximately 400 students per year are now being admitted with both a composite ACT score of 16 or less and a high school grade point average of less than 2.25. Assuming the previously determined percentages to still be accurate, this institution must consider a grim but realistic probability. Only 36, perhaps 37, of the original 400 will probably survive through graduation at this institution. Clearly, some special assistance programming is urgently needed for these marginal students.

This study determined that substantial amounts of use information are stored in computer files and that sufficient technology is available to analyze these data. The routine analysis of such information would be a valuable contribution to the decision-making process. The computer programs developed in this study should be refined and implemented to provide routine output for the campus community. As the

student population diversifies, the information capable of being generated by these programs will prove indispensable.

Modifications to these computer programs internally at The University of Tennessee, Knoxville could accommodate the "tracking" of students through course sequences and academic programs or by transfer patterns between colleges. Such modifications would be particularly helpful in that the findings of this study indicated substantial differences among colleges in the variety of students enrolled, quarters enrolled from admissions to graduation, and in persistence and graduation patterns. Further, the Dean of each of the respective colleges would certainly be interested and probably inclined to act upon information organized and presented in such a fashion. Such an approach would enlist the support of college administrators as well as department heads and faculty members. Programs could be designed to meet the needs of the students in each college; progress reports and other mechanisms to facilitate feedback could be designed to provide incentives for increasing the retention of students.

A cooperative exchange with THEC could further assist in the analysis of data. Computer summary tapes, such as the one generated in this study, could be routinely sent to THEC for additional analysis. For example, it would be helpful to know and easy to determine how many of the in-state freshmen, 61.2 percent, not graduated from The University of Tennessee, Knoxville actually graduated from another institution under the coordination of THEC. Similarly, it could be determined how many of the students, 56.0 percent, not graduated but leaving The University of Tennessee with above a 2.00 cumulative grade point average transferred

to another institution under the coordination of THEC. Transfer patterns among institutions could similarly be developed.

This later group of students leaving this university with better than 2.00 cumulative grade point average as of their last quarter of attendance would be one ideal target group of students that might easily be retained or at least assisted through a retention program specifically designed to meet identified needs. Routine surveys for other specific target groups should be developed and administered to provide the basis for programs of retention.

College success prediction equations developed from the indiscriminant compilation of all data available on a diversity of individuals are generally inapplicable on an individual basis. Care must be exercised to prevent unique students or distinct subpopulations from being lost in the equations developed from the masses. This study revealed that on an individual basis, 63.4 percent of all in-state freshmen could be classified correctly as graduates or non-graduates at the time of admissions. However, based on the same two variables which prepared that probability estimate, it was determined that 91.8 percent of the students with less than a 2.25 high school grade point average and a composite ACT score of 16 or less failed to persist through graduation. Such information tends to suggest that prediction equations specifically designed for distinct subpopulations might be considerably more useful than general equations developed for the "average" student. As numbers of nontraditional students increase, distinct prediction equations will become more functional.

Both prediction equations and retention programs must accomodate not only actual but also perceived needs of students. One-third of the entering students to institutions of higher education feel that individual tutoring or remedial work will be needed during the course of their academic career. Such information is available before the student even arrives on campus and needs to be dovetailed into "early alert" and other proactive programs. Further, numerous other clues are often provided by the students themselves in the course of their respective academic careers.

The preceding discussion and recommendations for further research were designed to provide the basis for beginning a comprehensive retention program on this campus. Such a proactive plan of action needs to be designed as The University of Tennessee, Knoxville prepares for the enrollment uncertainties of the 1980's.

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APPENDIXES

APPENDIX A

SPSS COMPUTER PROGRAM

```
//STONER JOB (834,64208,BINS,R-512K,L-10,T-60),STONER,
// MSGLEVEL=(1,1)
//*TAPE 0U4541,R
//*DISK STORBB
//S1 EXEC SPSS,REGION=512K,PARM=240K
//FT04F001 DD DSN=J834.P64208.KENST,UNIT=3330,
// SPACE=(2012,(1000,500),RLSE),VOL=SER=STORBB,
// DISP=(NEW,KEEP)
//FT08F001 DD UNIT=3400-4,VOL=SER=0U4541,DISP=(OLD,KEEP),
// DCB=(RECFM=FB,LRECL=96,BLKSIZE=6144),LABEL=(,NL),
// DSN=SRMOUT
//SYSIN DD *
RUN NAME.      RETENTION OF IN-STATE FRESHMEN
FILE NAME      RETAIN
DATA LIST      FIXED(1)/1 X02 10 X03 11-12 X04 13-14 X05 15-17
                X06 18 X07 19 (A) X08 20 X09 21 X10 22-23 X11 24-25
                X12 26 X13 27 X14 TO X16 28-33 X17 34-36
                X18 TO X42 37-61

INPUT MEDIUM   TAPE
N OF CASES      UNKNOWN
VAR LABELS      X02,QUARTER ENTERED/
                X03,YEAR ENTERED/
                X04,COMPOSITE ACT SCORE/
                X05,HIGH SCHOOL GPA/
                X06,SEX AND MARITAL STATUS/
                X07,COLLEGE ENROLLED/
                X08,RACE/
                X09,GRADUATED WITHIN 5 YEARS/
                X10,HOME COUNTY/
                X11,BIRTH MONTH/
                X12,AGE IN YEARS/
                X13,GRADUATED WITHIN 10 YEARS F.Q. 68 ONLY/
                X14,BIRTH YEAR/
                X15,GRADUATION MONTH/
                X16,GRADUATION YEAR/
                X17,COLLEGE GPA/
                X18,QUARTER 01/
                X19,QUARTER 02/
                X20,QUARTER 03/
                X21,QUARTER 04/
                X22,QUARTER 05/
                X23,QUARTER 06/
                X24,QUARTER 07/
                X25,QUARTER 08/
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X26, QUARTER 09/
 X27, QUARTER 10/
 X28, QUARTER 11/
 X29, QUARTER 12/
 X30, QUARTER 13/
 X31, QUARTER 14/
 X32, QUARTER 15/
 X33, QUARTER 16/
 X34, QUARTER 17/
 X35, QUARTER 18/
 X36, QUARTER 19/
 X37, QUARTER 20/
 X38, COMPOSITE ACT SCORE/
 X39, SEX/
 X40, HIGH SCHOOL GPA/
 X41, MARITAL STATUS/
 X42, COLLEGE CUMULATIVE GPA/
 VALUE LABELS X02 (1) FALL QUARTER (2) WINTER QUARTER (3) SPRING QUARTER
 (4) SUMMER QUARTER/
 X03 (68) 1968 (69) 1969 (70) 1970 (71) 1971 (72) 1972 (73) 1
 973/
 X06 (1) SINGLE FEMALES (2) MARRIED FEMALES (3) SINGLE MALES
 (4) MARRIED MALES/
 X07 (1) AGRICULTURE (2) BUSINESS (3) EDUCATION (4) ENGINEERI
 NG
 (5) LIBERAL ARTS (6) OTHER COLLEGES/
 X08 (1) WHITE (2) BLACK (3) OTHER/
 X09 (1) YES (2) NO/
 X10 (1) LOW INCOME (2) MEDIUM LOW INCOME (3) MEDIUM HIGH INC
 ONE
 (4) HIGH INCOME/
 X12 (1) 21 OR OVER (2) LESS THAN 21/
 X13 (1) YES (2) NO/
 X18 (0) NOT ENROLLED (1) ENROLLED/
 X19 (0) NOT ENROLLED (1) ENROLLED/
 X20 (0) NOT ENROLLED (1) ENROLLED/
 X21 (0) NOT ENROLLED (1) ENROLLED/
 X22 (0) NOT ENROLLED (1) ENROLLED/
 X23 (0) NOT ENROLLED (1) ENROLLED/
 X24 (0) NOT ENROLLED (1) ENROLLED/
 X25 (0) NOT ENROLLED (1) ENROLLED/
 X38 (1) 16 OR LOWER ACT (2) 17 OR GREATER ACT/
 X39 (1) ALL FEMALES (2) ALL MALES/
 X40 (1) 2.24 OR LOWER GPA (2) 2.25 OR HIGHER GPA/
 X41 (1) SINGLE STUDENTS (2) MARRIED STUDENTS/
 X42 (1) 0.99 OR LOWER (2) 1.00 TO 1.99 (3) 2.00 TO 2.99
 (4) 3.00 OR HIGHER/
 RECODE X18 (BLANK=10)(ELSE=1)
 RECODE X18 (1=1)(ELSE=0)
 RECODE X19 (BLANK=10)(ELSE=1)
 RECODE X19 (1=1)(ELSE=0)
 RECODE X20 (BLANK=10)(ELSE=1)
 RECODE X20 (1=1)(ELSE=0)
 RECODE X21 (BLANK=10)(ELSE=1)
 RECODE X21 (1=1)(ELSE=0)

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RECODE      X22 (BLANK=10)(ELSE=1)
RECODE      X22 (1=1)(ELSE=0)
RECODE      X23 (BLANK=10)(ELSE=1)
RECODE      X23 (1=1)(ELSE=0)
RECODE      X24 (BLANK=10)(ELSE=1)
RECODE      X24 (1=1)(ELSE=0)
RECODE      X25 (BLANK=10)(ELSE=1)
RECODE      X25 (1=1)(ELSE=0)
RECODE      X26 (BLANK=10)(ELSE=1)
RECODE      X26 (1=1)(ELSE=0)
RECODE      X27 (BLANK=10)(ELSE=1)
RECODE      X27 (1=1)(ELSE=0)
RECODE      X28 (BLANK=10)(ELSE=1)
RECODE      X28 (1=1)(ELSE=0)
RECODE      X29 (BLANK=10)(ELSE=1)
RECODE      X29 (1=1)(ELSE=0)
RECODE      X30 (BLANK=10)(ELSE=1)
RECODE      X30 (1=1)(ELSE=0)
RECODE      X31 (BLANK=10)(ELSE=1)
RECODE      X31 (1=1)(ELSE=0)
RECODE      X32 (BLANK=10)(ELSE=1)
RECODE      X32 (1=1)(ELSE=0)
RECODE      X33 (BLANK=10)(ELSE=1)
RECODE      X33 (1=1)(ELSE=0)
RECODE      X34 (BLANK=10)(ELSE=1)
RECODE      X34 (1=1)(ELSE=0)
RECODE      X35 (BLANK=10)(ELSE=1)
RECODE      X35 (1=1)(ELSE=0)
RECODE      X36 (BLANK=10)(ELSE=1)
RECODE      X36 (1=1)(ELSE=0)
RECODE      X37 (BLANK=10)(ELSE=1)
RECODE      X37 (1=1)(ELSE=0)
RECODE      X09 (BLANK=3)(ELSE=2)
IF          (X02 EQ 1 AND X03 EQ 68 AND ((X16 GE 68 AND LE 72) OR
          (X16 EQ 73 AND X15 LE 8))) X09=1
IF          (X02 EQ 1 AND X03 EQ 69 AND ((X16 GE 68 AND LE 73) OR
          (X16 EQ 74 AND X15 LE 8))) X09=1
IF          (X02 EQ 1 AND X03 EQ 70 AND ((X16 GE 68 AND LE 74) OR
          (X16 EQ 75 AND X15 LE 8))) X09=1
IF          (X02 EQ 1 AND X03 EQ 71 AND ((X16 GE 68 AND LE 75) OR
          (X16 EQ 76 AND X15 LE 8))) X09=1
IF          (X02 EQ 1 AND X03 EQ 72 AND ((X16 GE 68 AND LE 76) OR
          (X16 EQ 77 AND X15 LE 8))) X09=1
IF          (X02 EQ 2 AND X03 EQ 69 AND ((X16 GE 68 AND LE 72) OR
          (X16 EQ 73 AND X15 LE 12))) X09=1
IF          (X02 EQ 2 AND X03 EQ 70 AND ((X16 GE 68 AND LE 73) OR
          (X16 EQ 74 AND X15 LE 12))) X09=1
IF          (X02 EQ 2 AND X03 EQ 71 AND ((X16 GE 68 AND LE 74) OR
          (X16 EQ 75 AND X15 LE 12))) X09=1
IF          (X02 EQ 2 AND X03 EQ 72 AND ((X16 GE 68 AND LE 75) OR
          (X16 EQ 76 AND X15 LE 12))) X09=1
IF          (X02 EQ 2 AND X03 EQ 73 AND ((X16 GE 68 AND LE 76) OR

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      (X16 EQ 77 AND X15 LE 12))) X09=1
IF      (X02 EQ 3 AND X03 EQ 69 AND ((X16 GE 68 AND LE 73) OR
      (X16 EQ 74 AND X15 LE 3))) X09=1
IF      (X02 EQ 3 AND X03 EQ 70 AND ((X16 GE 68 AND LE 74) OR
      (X16 EQ 75 AND X15 LE 3))) X09=1
IF      (X02 EQ 3 AND X03 EQ 71 AND ((X16 GE 68 AND LE 75) OR
      (X16 EQ 76 AND X15 LE 3))) X09=1
IF      (X02 EQ 3 AND X03 EQ 72 AND ((X16 GE 68 AND LE 76) OR
      (X16 EQ 77 AND X15 LE 3))) X09=1
IF      (X02 EQ 3 AND X03 EQ 73 AND ((X16 GE 68 AND LE 77) OR
      (X16 EQ 78 AND X15 LE 3))) X09=1
IF      (X02 EQ 4 AND X03 EQ 69 AND ((X16 GE 68 AND LE 73) OR
      (X16 EQ 74 AND X15 LE 6))) X09=1
IF      (X02 EQ 4 AND X03 EQ 70 AND ((X16 GE 68 AND LE 74) OR
      (X16 EQ 75 AND X15 LE 6))) X09=1
IF      (X02 EQ 4 AND X03 EQ 71 AND ((X16 GE 68 AND LE 75) OR
      (X16 EQ 76 AND X15 LE 6))) X09=1
IF      (X02 EQ 4 AND X03 EQ 72 AND ((X16 GE 68 AND LE 76) OR
      (X16 EQ 77 AND X15 LE 6))) X09=1
IF      (X02 EQ 4 AND X03 EQ 73 AND ((X16 GE 68 AND LE 77) OR
      (X16 EQ 78 AND X15 LE 6))) X09=1
RECODE  X09 (1=1)(ELSE=2)
RECODE  X12 (0=4)(1=5)(2=6)(3=7)(BLANK=8)(ELSE=9)
IF      (X02 EQ 1 AND X03 EQ 68 AND ((X14 GE 30 AND LE 46)
      OR (X14 EQ 47 AND X11 LE 8))) X12 = 1
IF      (X02 EQ 1 AND X03 EQ 69 AND ((X14 GE 30 AND LE 47)
      OR (X14 EQ 48 AND X11 LE 8))) X12 = 1
IF      (X02 EQ 1 AND X03 EQ 70 AND ((X14 GE 30 AND LE 48)
      OR (X14 EQ 49 AND X11 LE 8))) X12 = 1
IF      (X02 EQ 1 AND X03 EQ 71 AND ((X14 GE 30 AND LE 49)
      OR (X14 EQ 50 AND X11 LE 8))) X12 = 1
IF      (X02 EQ 1 AND X03 EQ 72 AND ((X14 GE 30 AND LE 50)
      OR (X14 EQ 51 AND X11 LE 8))) X12 = 1
IF      (X02 EQ 2 AND X03 EQ 69 AND X14 GE 30 AND X14 LE 47) X12 = 1
IF      (X02 EQ 2 AND X03 EQ 70 AND X14 GE 30 AND X14 LE 48) X12 = 1
IF      (X02 EQ 2 AND X03 EQ 71 AND X14 GE 30 AND X14 LE 49) X12 = 1
IF      (X02 EQ 2 AND X03 EQ 72 AND X14 GE 30 AND X14 LE 50) X12 = 1
IF      (X02 EQ 2 AND X03 EQ 73 AND X14 GE 30 AND X14 LE 51) X12 = 1
IF      (X02 EQ 3 AND X03 EQ 69 AND ((X14 GE 30 AND LE 47)
      OR (X14 EQ 48 AND X11 LE 2))) X12 = 1
IF      (X02 EQ 3 AND X03 EQ 70 AND ((X14 GE 30 AND LE 48)
      OR (X14 EQ 49 AND X11 LE 2))) X12 = 1
IF      (X02 EQ 3 AND X03 EQ 71 AND ((X14 GE 30 AND LE 49)
      OR (X14 EQ 50 AND X11 LE 2))) X12 = 1
IF      (X02 EQ 3 AND X03 EQ 72 AND ((X14 GE 30 AND LE 50)
      OR (X14 EQ 51 AND X11 LE 2))) X12 = 1
IF      (X02 EQ 3 AND X03 EQ 73 AND ((X14 GE 30 AND LE 51)
      OR (X14 EQ 52 AND X11 LE 2))) X12 = 1
IF      (X02 EQ 4 AND X03 EQ 69 AND ((X14 GE 30 AND LE 47)
      OR (X14 EQ 48 AND X11 LE 5))) X12 = 1
IF      (X02 EQ 4 AND X03 EQ 70 AND ((X14 GE 30 AND LE 48)
      OR (X14 EQ 49 AND X11 LE 5))) X12 = 1

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IF      (X02 EQ 4 AND X03 EQ 71 AND ((X14 GE 30 AND LE 49)
OR (X14 EQ 50 AND X11 LE 5))) X12 = 1
IF      (X02 EQ 4 AND X03 EQ 72 AND ((X14 GE 30 AND LE 50)
OR (X14 EQ 51 AND X11 LE 5))) X12 = 1
IF      (X02 EQ 4 AND X03 EQ 73 AND ((X14 GE 30 AND LE 51)
OR (X14 EQ 52 AND X11 LE 5))) X12 = 1
RECODE  X12 (1=1)(8=3)(ELSE=2)
RECODE  X07 ('1'=1)('2'=2)('3'=3)('4'=4)('5'=6)('7'=5)(ELSE=6)
RECODE  X08 (1=1)(2=2)(ELSE=3)
RECODE  X10 (BLANK,00,96,97,98,99=100)
RECODE  X10 (01,05,06,20,34,44,48,79,82,83,94,95=101)(14,15,25,26,32
,35,
45,50,67,76=102)(02,03,09,10,11,12,17,18,23,24,27,28,31,33,3
8,
46,53,54,56,57,58,59,60,64,66,70,73,74,75,77,78,86,89,90,
92=103)
RECODE  X10 (100=5)(101=4)(102=1)(103=3)(ELSE=2)
IF      (X16 GE 68 AND X16 LE 79 AND X17 EQ 000) X17 = 401
IF      (X04 GE 00 AND X04 LE 16) X38 = 1
IF      (X04 GE 17 AND X04 LE 36) X38 = 2
IF      (X06 EQ 1 OR X06 EQ 2) X39 = 1
IF      (X06 EQ 3 OR X06 EQ 4) X39 = 2
IF      (X06 EQ 1 OR X06 EQ 3) X41 = 1
IF      (X06 EQ 2 OR X06 EQ 4) X41 = 2
RECODE  X13 (1=3)(BLANK=4)(ELSE=5)
IF      (X02 EQ 1 AND X03 EQ 68 AND X16 GE 68 AND X16 LE 79) X13 = 1
IF      (X02 EQ 1 AND X03 EQ 68 AND X16 EQ 0) X13=2
RECODE  X13 (1=1) (2=2)(ELSE=3)
RECODE  X05 (BLANK,000,001,002,003,004=3)
IF      (X05 GE 005 AND X05 LE 224) X40 = 1
IF      (X05 GE 225 AND X05 LE 400) X40 = 2
IF      (X17 GE 000 AND X17 LE 099) X42 = 1
IF      (X17 GE 100 AND X17 LE 199) X42 = 2
IF      (X17 GE 200 AND X17 LE 299) X42 = 3
IF      (X17 GE 300 AND X17 LE 400) X42 = 4
COMPUTE X43=0
IF      (X02 EQ 1 AND X03 EQ 68 AND ((X16 GE 68 AND LE 72)
OR (X16 EQ 73 AND X15 LE 8))) X43=1
IF      (X02 EQ 1 AND X03 EQ 68 AND (X16 EQ 0
OR (X16 EQ 73 AND X15 GE 9) OR X16 GE 74)) X43=2
RECODE  X43 (1=1) (2=2) (ELSE=3)
VAR LABELS X43,GRADUATED WITHIN 5 YEARS F.O. 68 ONLY/
VALUE LABELS X43 (1)YES (2)NO/
COMPUTE X44 = 0
COMPUTE X45 = 0
COMPUTE X46 = 0
IF      (X02 EQ 1 AND X03 EQ 68) X44 = 1
IF      (X02 EQ 2 AND X03 EQ 69) X44 = 2
IF      (X02 EQ 3 AND X03 EQ 69) X44 = 3
IF      (X02 EQ 4 AND X03 EQ 69) X44 = 4
IF      (X02 EQ 1 AND X03 EQ 69) X44 = 5
IF      (X02 EQ 2 AND X03 EQ 70) X44 = 6
IF      (X02 EQ 3 AND X03 EQ 70) X44 = 7
IF      (X02 EQ 4 AND X03 EQ 70) X44 = 8

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IF      (X02 EQ 1 AND X03 EQ 70) X44 = 9
IF      (X02 EQ 2 AND X03 EQ 71) X44 = 10
IF      (X02 EQ 3 AND X03 EQ 71) X44 = 11
IF      (X02 EQ 4 AND X03 EQ 71) X44 = 12
IF      (X02 EQ 1 AND X03 EQ 71) X44 = 13
IF      (X02 EQ 2 AND X03 EQ 72) X44 = 14
IF      (X02 EQ 3 AND X03 EQ 72) X44 = 15
IF      (X02 EQ 4 AND X03 EQ 72) X44 = 16
IF      (X02 EQ 1 AND X03 EQ 72) X44 = 17
IF      (X02 EQ 2 AND X03 EQ 73) X44 = 18
IF      (X02 EQ 3 AND X03 EQ 73) X44 = 19
IF      (X02 EQ 4 AND X03 EQ 73) X44 = 20
VAR LABELS X46,SEQUENCE QUARTER OF GRADUATION/
IF      (X09 EQ 1 AND X16 EQ 70 AND X15 EQ 08) X45 = 9
IF      (X09 EQ 1 AND X16 EQ 70 AND X15 EQ 12) X45 = 10
IF      (X09 EQ 1 AND X16 EQ 71 AND X15 EQ 03) X45 = 11
IF      (X09 EQ 1 AND X16 EQ 71 AND X15 EQ 06) X45 = 12
IF      (X09 EQ 1 AND X16 EQ 71 AND X15 EQ 08) X45 = 13
IF      (X09 EQ 1 AND X16 EQ 71 AND X15 EQ 12) X45 = 14
IF      (X09 EQ 1 AND X16 EQ 72 AND X15 EQ 03) X45 = 15
IF      (X09 EQ 1 AND X16 EQ 72 AND X15 EQ 06) X45 = 16
IF      (X09 EQ 1 AND X16 EQ 72 AND X15 EQ 08) X45 = 17
IF      (X09 EQ 1 AND X16 EQ 72 AND X15 EQ 12) X45 = 18
IF      (X09 EQ 1 AND X16 EQ 73 AND X15 EQ 03) X45 = 19
IF      (X09 EQ 1 AND X16 EQ 73 AND X15 EQ 06) X45 = 20
IF      (X09 EQ 1 AND X16 EQ 73 AND X15 EQ 08) X45 = 21
IF      (X09 EQ 1 AND X16 EQ 73 AND X15 EQ 12) X45 = 22
IF      (X09 EQ 1 AND X16 EQ 74 AND X15 EQ 03) X45 = 23
IF      (X09 EQ 1 AND X16 EQ 74 AND X15 EQ 06) X45 = 24
IF      (X09 EQ 1 AND X16 EQ 74 AND X15 EQ 08) X45 = 25
IF      (X09 EQ 1 AND X16 EQ 74 AND X15 EQ 12) X45 = 26
IF      (X09 EQ 1 AND X16 EQ 75 AND X15 EQ 03) X45 = 27
IF      (X09 EQ 1 AND X16 EQ 75 AND X15 EQ 06) X45 = 28
IF      (X09 EQ 1 AND X16 EQ 75 AND X15 EQ 08) X45 = 29
IF      (X09 EQ 1 AND X16 EQ 75 AND X15 EQ 12) X45 = 30
IF      (X09 EQ 1 AND X16 EQ 76 AND X15 EQ 03) X45 = 31
IF      (X09 EQ 1 AND X16 EQ 76 AND X15 EQ 06) X45 = 32
IF      (X09 EQ 1 AND X16 EQ 76 AND X15 EQ 08) X45 = 33
IF      (X09 EQ 1 AND X16 EQ 76 AND X15 EQ 12) X45 = 34
IF      (X09 EQ 1 AND X16 EQ 77 AND X15 EQ 03) X45 = 35
IF      (X09 EQ 1 AND X16 EQ 77 AND X15 EQ 06) X45 = 36
IF      (X09 EQ 1 AND X16 EQ 77 AND X15 EQ 08) X45 = 37
IF      (X09 EQ 1 AND X16 EQ 77 AND X15 EQ 12) X45 = 38
IF      (X09 EQ 1 AND X16 EQ 78 AND X15 EQ 03) X45 = 39
IF      (X09 EQ 1 AND X16 EQ 78 AND X15 EQ 06) X45 = 40
IF      (X09 EQ 1 AND X16 EQ 78 AND X15 EQ 08) X45 = 41
COMPUTE X46 = X45 - X44
IF      (X46 EQ 8) X25 = 2
IF      (X46 EQ 9) X26 = 2
IF      (X46 EQ 10) X27 = 2
IF      (X46 EQ 11) X28 = 2
IF      (X46 EQ 12) X29 = 2

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IF      (X46 EQ 13) X30 = 2
IF      (X46 EQ 14) X31 = 2
IF      (X46 EQ 15) X32 = 2
IF      (X46 EQ 16) X33 = 2
IF      (X46 EQ 17) X34 = 2
IF      (X46 EQ 18) X35 = 2
IF      (X46 EQ 19) X36 = 2
IF      (X46 EQ 20) X37 = 2
IF      (X25 EQ 2) X26 = 0
IF      (X25 EQ 2) X27 = 0
IF      (X25 EQ 2) X28 = 0
IF      (X25 EQ 2) X29 = 0
IF      (X25 EQ 2) X30 = 0
IF      (X25 EQ 2) X31 = 0
IF      (X25 EQ 2) X32 = 0
IF      (X25 EQ 2) X33 = 0
IF      (X25 EQ 2) X34 = 0
IF      (X25 EQ 2) X35 = 0
IF      (X25 EQ 2) X36 = 0
IF      (X25 EQ 2) X37 = 0
IF      (X26 EQ 2) X27 = 0
IF      (X26 EQ 2) X28 = 0
IF      (X26 EQ 2) X29 = 0
IF      (X26 EQ 2) X30 = 0
IF      (X26 EQ 2) X31 = 0
IF      (X26 EQ 2) X32 = 0
IF      (X26 EQ 2) X33 = 0
IF      (X26 EQ 2) X34 = 0
IF      (X26 EQ 2) X35 = 0
IF      (X26 EQ 2) X36 = 0
IF      (X26 EQ 2) X37 = 0
IF      (X27 EQ 2) X28 = 0
IF      (X27 EQ 2) X29 = 0
IF      (X27 EQ 2) X30 = 0
IF      (X27 EQ 2) X31 = 0
IF      (X27 EQ 2) X32 = 0
IF      (X27 EQ 2) X33 = 0
IF      (X27 EQ 2) X34 = 0
IF      (X27 EQ 2) X35 = 0
IF      (X27 EQ 2) X36 = 0
IF      (X27 EQ 2) X37 = 0
IF      (X28 EQ 2) X29 = 0
IF      (X28 EQ 2) X30 = 0
IF      (X28 EQ 2) X31 = 0
IF      (X28 EQ 2) X32 = 0
IF      (X28 EQ 2) X33 = 0
IF      (X28 EQ 2) X34 = 0
IF      (X28 EQ 2) X35 = 0
IF      (X28 EQ 2) X36 = 0
IF      (X28 EQ 2) X37 = 0
IF      (X29 EQ 2) X30 = 0
IF      (X29 EQ 2) X31 = 0

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IF      (X29 EQ 2) X32 = 0
IF      (X29 EQ 2) X33 = 0
IF      (X29 EQ 2) X34 = 0
IF      (X29 EQ 2) X35 = 0
IF      (X29 EQ 2) X36 = 0
IF      (X29 EQ 2) X37 = 0
IF      (X30 EQ 2) X31 = 0
IF      (X30 EQ 2) X32 = 0
IF      (X30 EQ 2) X33 = 0
IF      (X30 EQ 2) X34 = 0
IF      (X30 EQ 2) X35 = 0
IF      (X30 EQ 2) X36 = 0
IF      (X30 EQ 2) X37 = 0
IF      (X31 EQ 2) X32 = 0
IF      (X31 EQ 2) X33 = 0
IF      (X31 EQ 2) X34 = 0
IF      (X31 EQ 2) X35 = 0
IF      (X31 EQ 2) X36 = 0
IF      (X31 EQ 2) X37 = 0
IF      (X32 EQ 2) X33 = 0
IF      (X32 EQ 2) X34 = 0
IF      (X32 EQ 2) X35 = 0
IF      (X32 EQ 2) X36 = 0
IF      (X32 EQ 2) X37 = 0
IF      (X33 EQ 2) X34 = 0
IF      (X33 EQ 2) X35 = 0
IF      (X33 EQ 2) X36 = 0
IF      (X33 EQ 2) X37 = 0
IF      (X34 EQ 2) X35 = 0
IF      (X34 EQ 2) X36 = 0
IF      (X34 EQ 2) X37 = 0
IF      (X35 EQ 2) X36 = 0
IF      (X35 EQ 2) X37 = 0
IF      (X36 EQ 2) X37 = 0

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VALUE LABELS

X26 (0) NOT ENROLLED (1) ENROLLED

(2)ENROLLED AND GRADUATED/

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X27 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X28 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X29 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X30 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X31 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X32 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X33 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X34 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X35 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X36 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/
X37 (0) NOT ENROLLED (1) ENROLLED (2)ENROLLED AND GRADUATED/

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RECODE X39(1=1)(ELSE=2)

RECODE X41(2=2)(ELSE=1)

RECODE X20(0=0)(ELSE=1)

RECODE X21(0=0)(ELSE=1)

RECODE X22(0=0)(ELSE=1)

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RECODE          X23(0=0)(ELSE=1)
RECODE          X24(0=0)(ELSE=1)
RECODE          X25(0=0)(ELSE=1)
FREQUENCIES     GENERAL = X02,X03,X07,X08,X09,X12,X38,X39,X41
OPTIONS         3,8
READ INPUT DATA
*SELECT IF      (X10 GE 1 AND LE 4)
FREQUENCIES     GENERAL = X10
OPTIONS         3,8
*SELECT IF      (X13 EQ 1 OR EQ 2)
FREQUENCIES     GENERAL=X13
OPTIONS         3,8
*SELECT IF      (X40 EQ 1 OR EQ 2)
FREQUENCIES     GENERAL=X40
OPTIONS         3,8
*SELECT IF      (X43 GE 1 AND LE 2)
FREQUENCIES     GENERAL=X43
OPTIONS         3,8
*SELECT IF      (X09 EQ 1)
FREQUENCIES     GENERAL = X07,X08,X12,X38,X39,X41
OPTIONS         3,8
*SELECT IF      ((X10 GE 1 AND LE 4) AND X09 EQ 1)
FREQUENCIES     GENERAL = X10
OPTIONS         3,8
*SELECT IF      (X09 EQ 1 AND (X40 EQ 1 OR EQ 2))
FREQUENCIES     GENERAL = X40
OPTIONS         3,8
*SELECT IF      (X09 EQ 2 AND (X42 GE 1 AND LE 4))
FREQUENCIES     GENERAL = X42
OPTIONS         3,8
*SELECT IF      (X38 EQ 1)
FREQUENCIES     GENERAL = X07,X08,X09,X12,X39,X41
OPTIONS         3
*SELECT IF      ((X10 GE 1 AND LE 4) AND X38 EQ 1)
FREQUENCIES     GENERAL = X10
OPTIONS         3
*SELECT IF      (X38 EQ 1 AND (X40 EQ 1 OR EQ 2))
FREQUENCIES     GENERAL = X40
OPTIONS         3
*SELECT IF      (X38 EQ 1 AND (X42 GE 1 AND LE 4))
FREQUENCIES     GENERAL = X42
OPTIONS         3
*SELECT IF      (X38 EQ 1 AND X40 EQ 1)
FREQUENCIES     GENERAL = X09
OPTIONS         3,8
*SELECT IF      (X08 EQ 2 AND X38 EQ 1)
FREQUENCIES     GENERAL = X09
OPTIONS         3,8
*SELECT IF      (X08 EQ 2 AND X38 EQ 1 AND X40 EQ 1)
FREQUENCIES     GENERAL = X09
OPTIONS         3,8
FREQUENCIES     GENERAL = X18 TO X37

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OPTIONS 3
*SELECT IF (X38 EQ 1 AND X40 EQ 1 AND X10 EQ 1)
FREQUENCIES GENERAL = X09
OPTIONS 3,8
*SELECT IF (X46 GE 1 AND LE 20)
FREQUENCIES GENERAL=X46
OPTIONS 3,8
SAVE FILE
FINISH
```

```
COMMENT THE FOLLOWING SPSS CONTROL CARDS WERE USED FOR
A SUBSEQUENT ANALYSIS. NOTE THE NEED FOR AN
ADDITIONAL MISSING VALUES CARD.
```

```
MISSING VALUES X05(3)/X10(5)/
DISCRIMINANT GROUPS=X09(1,2)/VARIABLES=X04,X05,X10/
ANALYSIS=X04,X05,X10/METHOD=WILKS/
OPTIONS 5
```

APPENDIX B

SAS COMPUTER PROGRAM

```
//STONSAS JOB (834,64208,BINS,R-512K,L-10,T-20),STONER,
// MSGLEVEL=(1,1)
//*DISK STORBB
//S1 EXEC SPSS,REGION=512K,PARM=240K
//FT03F001 DD DSN=J834.P64208.KENST,UNIT=3330,
// VOL=SER=STORBB,
// DISP=(OLD,KEEP)
//FT04F001 DD DSN=&&TEMP,UNIT=3330,
// SPACE=(2012,(1000,500),RLSE),VOL=SER=STORBB,
// DISP=(NEW,PASS)
//SYSIN DD *
FILE NAME      RETSAS
GET FILE       RETAIN
SAVE FILE
FINISH
//S2 EXEC SAS,REGION=512K
//WORK DD UNIT=WORK,SPACE=(TRK,(200,50))
//XYZ DD DSN=&&TEMP,DISP=(OLD,DELETE)
//XOUT DD UNIT=ONLINE,DISP=(NEW,CATLG,DELETE),
// DSN=J834.P64208.KENSAS,SPACE=(TRK,(100,50),RLSE)
//SYSIN DD *
PROC CONVERT SPSS=XYZ OUT=KEN;
DATA XOUT.KS; SET KEN;
PROC CONTENTS;

//X40PT1 JOB (834,64208,BINS,R-256K,T-3,L-10),STONER,
// MSGLEVEL=(1,1)
//S1 EXEC SASBOTH,REGION=256K
//XYZ DD DSN=J834.P64208.KENSAS,DISP=SHR
//SYSIN DD *
DATA X40D; SET XYZ.KS;
IF X40 NE 0;
IF X18=2 THEN X18=1;
IF X19=2 THEN X19=1;
IF X20=2 THEN X20=1;
IF X21=2 THEN X21=1;
IF X22=2 THEN X22=1;
IF X23=2 THEN X23=1;
IF X24=2 THEN X24=1;
IF X25=2 THEN X25=1;
IF X26=2 THEN X26=1;
IF X27=2 THEN X27=1;
IF X28=2 THEN X28=1;
```

```

IF X29=2 THEN X29=1;
IF X30=2 THEN X30=1;
IF X31=2 THEN X31=1;
IF X32=2 THEN X32=1;
IF X33=2 THEN X33=1;
IF X34=2 THEN X34=1;
IF X35=2 THEN X35=1;
IF X36=2 THEN X36=1;
IF X37=2 THEN X37=1;
DATA X401;SET X40D; IF X40=1;
PROC MEANS SUM ; VAR X18-X37;
OUTPUT OUT=X401S SUM=S18-S37;
DATA X401P; SET X401S;
DROP S18-S37;
N=1; SL1=S18; OUTPUT;
N=2; SL1=S19; OUTPUT;
N=3; SL1=S20; OUTPUT;
N=4; SL1=S21; OUTPUT;
N=5; SL1=S22; OUTPUT;
N=6; SL1=S23; OUTPUT;
N=7; SL1=S24; OUTPUT;
N=8; SL1=S25; OUTPUT;
N=9; SL1=S26; OUTPUT;
N=10; SL1=S27; OUTPUT;
N=11; SL1=S28; OUTPUT;
N=12; SL1=S29; OUTPUT;
N=13; SL1=S30; OUTPUT;
N=14; SL1=S31; OUTPUT;
N=15; SL1=S32; OUTPUT;
N=16; SL1=S33; OUTPUT;
N=17; SL1=S34; OUTPUT;
N=18; SL1=S35; OUTPUT;
N=19; SL1=S36; OUTPUT;
N=20; SL1=S37; OUTPUT;
PROC PRINT;
DATA X402;SET X40D; IF X40=2;
PROC MEANS SUM ; VAR X18-X37;
OUTPUT OUT=X402S SUM=S18-S37;
DATA X402P; SET X402S;
DROP S18-S37;
N=1; SL2=S18; OUTPUT;
N=2; SL2=S19; OUTPUT;
N=3; SL2=S20; OUTPUT;
N=4; SL2=S21; OUTPUT;
N=5; SL2=S22; OUTPUT;
N=6; SL2=S23; OUTPUT;
N=7; SL2=S24; OUTPUT;
N=8; SL2=S25; OUTPUT;
N=9; SL2=S26; OUTPUT;
N=10; SL2=S27; OUTPUT;
N=11; SL2=S28; OUTPUT;
N=12; SL2=S29; OUTPUT;
N=13; SL2=S30; OUTPUT;

```

```

N=14; SL2=S31; OUTPUT;
N=15; SL2=S32; OUTPUT;
N=16; SL2=S33; OUTPUT;
N=17; SL2=S34; OUTPUT;
N=18; SL2=S35; OUTPUT;
N=19; SL2=S36; OUTPUT;
N=20; SL2=S37; OUTPUT;
PROC PRINT;
DATA PLOT40; MERGE X401P X402P;
PROC PRINT;
PROC PLOT; PLOT SL1*N='1' SL2*N='2' /OVERLAY;
PROC CALPLOT OVLY XAXIS=8.5 YAXIS=5.5 ;
VAR SL1 SL2 N;
PARMCARDS;

```

```

//X40PT2 JOB (834,64208,BINS,R-256K,T-3,L-10),STONER,
// MSGLEVEL=(1,1)
//S1 EXEC SASBOTH,REGION=256K
//XYZ DD DSN=J834.P64208.KENSAS,DISP=SHR
//SYSIN DD *
DATA X40D; SET XYZ.KS;
IF X40 NE 0;
IF X26 NE 0 THEN X26=X26-1;
IF X27 NE 0 THEN X27=X27-1;
IF X28 NE 0 THEN X28=X28-1;
IF X29 NE 0 THEN X29=X29-1;
IF X30 NE 0 THEN X30=X30-1;
IF X31 NE 0 THEN X31=X31-1;
IF X32 NE 0 THEN X32=X32-1;
IF X33 NE 0 THEN X33=X33-1;
IF X34 NE 0 THEN X34=X34-1;
IF X35 NE 0 THEN X35=X35-1;
IF X36 NE 0 THEN X36=X36-1;
IF X37 NE 0 THEN X37=X37-1;
DATA X401;SET X40D; IF X40=1;
PROC MEANS SUM ; VAR X26-X37;
OUTPUT OUT=X401S SUM=S26-S37;
DATA X401P; SET X401S;
DROP S26-S37;
N=9; SL1=S26; OUTPUT;
N=10; SL1=S27; OUTPUT;
N=11; SL1=S28; OUTPUT;
N=12; SL1=S29; OUTPUT;
N=13; SL1=S30; OUTPUT;
N=14; SL1=S31; OUTPUT;
N=15; SL1=S32; OUTPUT;
N=16; SL1=S33; OUTPUT;
N=17; SL1=S34; OUTPUT;
N=18; SL1=S35; OUTPUT;
N=19; SL1=S36; OUTPUT;
N=20; SL1=S37; OUTPUT;

```

```
PROC PRINT;
DATA X402; SET X40D; IF X40=2;
PROC MEANS SUM ; VAR X26-X37;
OUTPUT OUT=X402S SUM=S26-S37;
DATA X402P; SET X402S;
DROP S26-S37;
N=9; SL2=S26; OUTPUT;
N=10; SL2=S27; OUTPUT;
N=11; SL2=S28; OUTPUT;
N=12; SL2=S29; OUTPUT;
N=13; SL2=S30; OUTPUT;
N=14; SL2=S31; OUTPUT;
N=15; SL2=S32; OUTPUT;
N=16; SL2=S33; OUTPUT;
N=17; SL2=S34; OUTPUT;
N=18; SL2=S35; OUTPUT;
N=19; SL2=S36; OUTPUT;
N=20; SL2=S37; OUTPUT;
PROC PRINT;
DATA PLOT40; MERGE X401P X402P;
PROC PRINT;
PROC PLOT; PLOT SL1*N='1' SL2*N='2' /OVERLAY;
PROC CALPLOT OVLY XAXIS=8.5 YAXIS=5.5 ;
VAR SL1 SL2 N;
PARMCARDS;
```

VITA

Kenneth L. Stoner was born in Hays, Kansas on August 8, 1946. He graduated from Garden City Senior High School, Garden City, Kansas in the spring of 1964. The following fall he entered Kansas State University, Manhattan, Kansas and in January, 1969, he received a Bachelor of Science degree in Physical Sciences in the College of Education.

In February of 1969 he accepted employment with the Department of Residence at Iowa State University, Ames, Iowa and received a Master of Science degree in Higher Education in the College of Education in May, 1971. He entered graduate school at The University of Tennessee, Knoxville in January, 1974, and received the Doctor of Education degree with a major in Educational Administration and Supervision in the College of Education in August, 1979.

In the fall of 1971 he was employed as a resident instructor at The University of South Florida. In the fall of 1973 he was employed by The University of Tennessee, Knoxville in the Department of Residence Halls where he held the positions of assistant director and associate director through his graduation in August, 1979.

The author has published sixteen articles on residence halls and is the Editor of The Journal of College and University Student Housing.