IDENTIFICATION OF COLLEGE FRESHMEN ACCORDING TO
SCHOLASTIC AND PERSISTENCE POTENTIAL

Dissertation

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

for the Degree of

Doctor of Philosophy

By

William F. Adams, B.A., M.A.

Denton, Texas

December, 1992
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This study was designed to develop a procedure for the identification of freshman students at risk in the academic and social integration process at Texas Christian University. The data for the study were collected from the Student Information Form (SIF) and student records system at Texas Christian University. The data included demographic, attitudinal, educational background and one-year persistence indicators (retain and drop) as well as one-year cumulative grade point averages for the fall 1990 entering freshman class.

Ninety-three percent of the 1140 first-time, full-time freshmen enrolled in the fall of 1990 were included in the study group (N=1059). Correlation analysis and discriminant analysis procedures were used in the analysis of the study group. The .05 level was used as a minimum level to establish statistical significance.

The average grade in high school as well as the father's educational level and the mother's educational level were significantly correlated with and predictive of persistence and scholastic ability. The students were accurately identified at a 71.95% rate with respect to scholastics and persistence. Examination of the data by gender increased the accuracy rate to 78.56%.

The educational levels of both parents and the average high school grade of students assumed a major role in the scholastic ability and persistence of the
student during the first year of the university experience. Students who returned for their second year were more predictable with respect to persistence than students who did not return. Females exhibited less confidence in both academic and social abilities when compared to the males.

Further investigation should include an examination of scholastic ability and persistence as a function of specific time intervals. The identification and isolation of additional factors related to the social integration process should also be examined.
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CHAPTER I

INTRODUCTION

Student persistence has been a subject of considerable theoretical discussion and empirical study over the past half century. Although the topic has been examined and researched at length, the complex nature and the variety of the variables potentially associated with student persistence points to the need for further examination (Hossler, 1984).

Based upon statistics provided by the U.S. Department of Education, the number of high school graduates from 1979 to 1986 dropped from 3.08 million to 2.68 million after a continuous growth period from 1965 to 1978. Consequently, the number of enrolling college students dropped from 13.6 million in 1983 to 13.3 million in 1985. Projections for high school graduates and enrolling college students reflect a continual decline through 1994 (Crockett, 1977). The prospect of a diminishing pool of enrolling college students coupled with the high cost of recruiting students in a highly competitive marketplace should place a much greater focus on the issues of student retention and attrition.

The exact instant when the decision is made to leave the university varies with each freshman dropout. However, retention experts such as Lee Noel and Randi Levitz of the Noel/Levitz Centers For Institutional Effectiveness And Innovation, Inc. agree that university freshmen make the decision to leave the
institution within the first six weeks of their first semester (Noel, Levitz and Saluri, 1987). This early decision to leave presents problems for the university organizations designed to help such students. Academic difficulties usually do not begin to surface until midterm while problems in the social and personal areas may not appear until someone conducts an exit interview. At this time the real reason may be masked by a more convenient, acceptable explanation such as a financial problem.

When freshmen enter the university they bring with them certain perceptions of their academic and social abilities as well as personal traits obtained in their formal and informal training (Astin, 1975; Hossler, 1984; Tinto, 1975). The academic and demographic attributes of the students are well-documented according to age, sex, ethnic background, high school grades, rank in class and aptitude test scores while the social and personal characteristics are not as readily available to the university. Because of the availability of academic and demographic data, many universities focus on academic and demographic data when studying the persistence of college freshmen. The analysis of persistence trends are subject to many weeks of data gathering, verification, entry and collation before any useful information can be obtained and delivered to the appropriate university organizations (Hossler, 1984).

A method for the early classification, prior to the critical first six week period, of all enrolled freshmen students with respect to persistence and scholastic potential should be beneficial to university administrators. Such early
identification would allow for timely decisions regarding resource allocations for academic and nonacademic programs. The study of a classification methodology (based upon scholastic and persistence potential) for the fall 1990 entering freshman class at Texas Christian University also includes comparisons of subgroups within the freshman cohort which should be beneficial to administrators in targeting distinctive groups for specific intervention programs aimed at reducing attrition.

**Statement of the Problem**

The problem of this study was to develop a procedure that could be utilized to identify retain and attrition subgroups of the entering 1990 fall semester freshman cohort at Texas Christian University prior to the beginning of formal classes.

**Purposes of the Study**

The purposes of this study were: (a) to classify the entering freshman class into four mutually exclusive groups: HIGH GPA/RETAIN, HIGH GPA/DROP, LOW GPA/RETAIN, and LOW GPA/DROP based upon an array of self-reported and actual variables of scholastics (GPA) and persistence (retain and drop); (b) to compare the relationships among groups with respect to scholastics and persistence; and (c) to determine if there were significant differences between genders in the four groups with respect to the variables that classified them into their respective groups.
Research Questions

There is evidence that freshman dropouts will make the decision to leave the university in the early portion of their first semester (Noel, Levitz and Saluri, 1987). The decision to leave the university in the early part of the first semester combined with the higher attrition rate for freshmen when compared to other undergraduate classes and the high cost of recruiting new students in a highly competitive marketplace demands early identification of freshmen with respect to scholastic and persistence potential. The early identification of these students is often complicated and hindered by the lack of appropriate and timely data.

To carry out the stated purposes of the study, four research questions were investigated that related to the classification of college freshmen according to scholastic and persistence potential.

1. What variables are significantly related to the freshmen students' scholastic ability and persistence?

2. Do these variables significantly add to the differentiation of students with respect to scholastic ability and persistence?

3. Is there a significant difference between genders within the same group with respect to the differentiating variables?

4. Is the accuracy of classifying students into groups on the basis of the variables statistically significant when compared to the classification based upon actual scholastic and persistence data?
Theoretical Basis of the Study

Over the last half of the twentieth century, there seems to have emerged three general theories related to student retention. John Summerskill (1962) built his theory of student retention upon the concept of matching the student to the educational institution. William Spady (1970) and Vincent Tinto (1975) approached student retention with an underlying foundation of matching the institution to the individual student needs. Lee Noel, Randi Levitz, and Diana Saluri (1987) combined the first two theories seeking to explain student retention as a result of matching the student to the institution and continually defining and refining university programs to reflect the changing needs of the student.

The academic, psychological, economic, and social attributes of the individual student as well as the unique characteristics of the institution (including overall mission, course offerings, and geographic setting) are inherent in each of the three theories. However, the theories differ in combination and degree of importance of student and institutional descriptors considered.

Summerskill (1962) and Marks (1967) focused on the academic abilities of the student as the driving force behind retention. Their theory of retention appears to be widely utilized in many educational institutions, perhaps because it is the easiest to quantify according to Robert Cope and William Hannah (1975).

Heilbrun (1965), Rose and Elton (1966), and Waterman and Waterman (1972) explored the psychological aspects of the student as they related to retention. Tinto (1987) stressed the uniqueness of the individual student as well
as the unique environment (college or university) in which the student functions. The major thrust of Vincent Tinto's theory of retention centers around the impact that the institutional environment has upon the student attempting to function within that environment. The staying power of the student is more a function of the institutional environment lending itself or "matching" to the student needs. In this manner the student is able to transition from a high school society to membership within the university environment, according to Tinto (1987).

Nancy Christie and Sarah Dinham (1991) extended Tinto's model to include the environment external to the institution. They contended that the social integration of the student into the life of the institution is greatly influenced by environmental forces such as high school friends and parents. The results of their study suggest that the utilization of university programs aimed at the student's parents and friends could serve as retention agents for the student.

Another group of student retention theorists includes Vorhees (1984), Manski and Wise (1983), and Jensen (1981). They maintained that the choice to remain in school reflected the economic structure of society at any given point in time. Their theory might match the student to the institution based upon the student's financial status and attempt to match the institution to the student in the form of financial aid which could be made available to supplement the individual's education.
Significance of the Study

The significance of the study is in its potential ability to quickly and easily identify all freshmen students who may be at risk or who may be successful (with respect to scholastics and persistence) in one process. The information obtained from the classification process could be routed to appropriate faculty, academic help center, housing, and student services for a more in-depth study of the individuals within each group. The academic and student services areas could focus on the students classified into the groups with the greatest potential for dropping out of school at the beginning of the semester rather than at the midterm or end of the semester when the student may have already made the decision to leave the university. Intervention strategies such as mentor programs, tutoring and counseling could be more efficiently developed and targeted to specific students who could benefit most from such attention. Intervention programs could be evaluated and enhanced more effectively with this early identification process for students at risk of leaving the university.

Definition of Terms

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

At risk refers to students who are prone to leaving the university due to academic, social or personal difficulties.

Attrition rate is the percentage of students enrolled for a semester who do not enroll for the following semester. The rate is cumulative over semesters.
Dropout is any student who enrolls in the university then leaves for any period of time without graduating.

High GPA refers to the student's cumulative grade point average greater than or equal to 2.0 on a 0.0 to 4.0 scale.

Intervention strategies are methods or programs utilized by the university in order to help students overcome academic, social or personal problems that might otherwise cause the student to leave the university.

Low GPA refers to the student's cumulative grade point average less than 2.0 on a 0.0 to 4.0 scale.

Persistence is the ability of the student to successfully cope with the academic, social and personal aspects of university life and remain continually engaged in the educational process at the university until graduation.

Retention rate refers to the percentage of students enrolled for a semester who enroll for the following semester. The rate is cumulative over semesters.

Scholastics is the academic standing of the student as reflected by the cumulative grade point average.

Limitations of the Study

This study is directed toward the identification of at risk students once they have been admitted to the university and toward the individualizing and targeting of at risk students for retention strategies. This study does not address the process by which students are granted admission into the university.
Delimitations of the Study

The development of a procedure to classify students based on scholastic and persistence potential for subgroups within the fall 1990 freshman class at Texas Christian University primarily focuses on methodology.

Each university or college is unique. There may be potential persistence-impacting, institution-specific variables which are programmatic in nature that are not considered in this study.

Student-related variables which are not measurable prior to the fall registration are also excluded. The use of variables that are available prior to fall registration allows for the classification process to be completed before the students enter the formal classroom setting and well before the initial six week period when students are most likely to make the decision to leave the university (Noel, Levitz and Sahuri, 1987).

Basic Assumptions

The following assumptions relate to this study.

1. The admissions policies at Texas Christian University remained relatively unchanged from 1990 to 1991, and the university enrolled academically comparable freshmen students in the 1990 and 1991 fall semesters.

2. The freshmen students enrolled at Texas Christian University for the fall 1990 semester were relatively comparable to the freshmen students who enrolled for the fall 1991 semester with respect to nonacademic characteristics.
Summary

Although student persistence has been the subject of much discussion and research, the early identification of students who are at risk of dropping out remains a cumbersome, if not impossible, task. In many instances, the academic problems of the student are not apparent until after the midterm grades are computed. Social or personal problems may not be revealed until the student is administered an exit interview. Even at this point the true reason or for the student's lack of persistence may be masked by a more convenient or socially acceptable answer centering around finances.

The freshman student appears to be the most susceptible to dropping out of the university setting. Perhaps, as Tinto (1987) and Durkheim (1951) advocate, the environment in which the individual operates greatly influences the action. Entering a university setting is a time of tremendous change and transition in the life of the individual (Swanson, 1967). Students who are at risk due to any combination of academic, social or personal problems need to be identified as soon as possible after their matriculation within the university. An early identification process for students would allow intervention strategies to be targeted to those students who would derive the greatest benefit. Intervention strategies could be more effectively evaluated and enhanced to meet the specific needs of at risk students. An added benefit of the early classification process would be to direct positive reinforcement programs to those students identified as potential retain students.
The purposes of this study were (a) to develop a method to classify the entering freshman class at Texas Christian University for the fall of 1990 into four mutually exclusive groups based on scholastic ability and persistence, (b) to compare scholastic and persistence relationships among the classification groups, and (c) to determine any significant differences between genders with respect to the variables utilized in the classification model.
CHAPTER II

REVIEW OF THE LITERATURE

A General Overview of Student Persistence Trends

The lack of student persistence presents a wide range of problems for many colleges and universities. With the publication of Increasing Student Retention, Noel, Levitz and Saluri (1987) documented a decade of consulting experiences with over 375 colleges and universities. Their findings indicated that there was a linear relationship between "admissions selectivity and attrition rates" (Noel, Levitz and Saluri, 1987, p. 6).

In a study involving 1,473 colleges and universities, Noel, Levitz and Saluri (1987) found that colleges and universities with higher selectivity standards, as measured by the American College Testing Program scores (ACT) and the Scholastic Aptitude Test scores (SAT), had the lowest attrition rates from the freshman to sophomore year when compared to institutions that admitted all students restricted only by seating capacity. From their consulting efforts, they surmised that the concept of student persistence followed the admission course of student selection and guidance in the 1960's to student recruitment in the 1970's to student satisfaction in the 1980's.

More than ten million freshmen students entered college during the 1960's decade while the 1970's accounted for more than fifteen million entering
freshmen. Of these numbers, thirty to forty percent consistently join the ranks of non-persisters and never earn a degree (Cope and Hannah, 1975). The number of high school graduates and entering college freshmen declined throughout the 1980's with projections of a continuation of this downward trend until 1994 (Crockett, 1977).

One major realization by Cope and Hannah (1975) was that the majority of non-persisting students, in institutions which they examined, were doing satisfactory work in their courses at the time of departure. Similar findings have been confirmed in various other studies (Astin, 1975; Pervin, Reik and Dalrymple, 1966; Hossler and Bean, 1990; Brigman and Jacobs, 1979; Chase, 1976).

Perhaps, the major problem associated with student persistence is the belief that it is the exclusive responsibility of the student services area (Beal and Noel, 1980). In reality, the responsibility of ensuring student persistence is a campus-wide responsibility with active participation by faculty, staff and administrators (Hossler and Bean, 1990).

College and university administrators of the 1990's are faced with a highly competitive environment for fewer entering freshmen and even smaller numbers of persisters when compared to previous decades.

Research Related to the Accuracy of Self-Reported Data

The assimilation and integration of data, that can be converted to useful information about the student, is often cumbersome and time-consuming in the university's traditional, function-oriented data base environment (Hossler, 1984;
Hossler and Bean, 1990). The identification and collection of self-reported data from students could ensure a timely and integrated data set for analysis purposes (Hossler, 1984).

As early as 1937, research (Walker, 1937) revealed that official records' data and self-reported data provided by college students tended to exhibit a high degree of agreement. Findings in studies by Walsh (1967) showed that college students tend to report at an 80% accuracy level on grades even when it involved reporting failures. Walsh also discovered that the students continued to report accurate data even when offered financial incentives to distort the data.

According to a study conducted by Richards and Lutz (1968), the correlations between self-reported grade point average and actual grade point average for men and women in 19 four-year colleges were 84% and 86% respectively. These results compare favorably with a similar study conducted by Baird (1969) involving 27 two-year colleges. Baird found that self-reported grades correlated at 83% and 86% to actual grade point average for men and women respectively.

A study, involving 2,775 randomly selected applicants to the colleges in the Massachusetts State College System, revealed that the correlation of self-reported grades, as reported by the students on the Student Descriptive Questionnaire, to transcript-reported grades was 74%. The study also revealed that there were no differences in the reporting of grades when the data were grouped by residence,
family income, marital status, or ethnic background (Armgstrong and Jensen, 1974).

In association with the American College Testing Program (ACT), Maxey and Ormsby (1971) found a 90% agreement level between nonacademic student-reported achievement items and school-reported achievement items. The items consisted of achievement in art, writing, science, speech and leadership. Further investigation revealed that only six percent of the students actually reported achievements of which the schools had no records.

Research Related to Scholastic Ability

In addition to high correlations between self-reported grades and actual grade point average, Richards, Holland and Lutz (1967) discovered that self-reported grades were actually better predictors of college grades than tests of achievement. Hoyt and Munday (1968) concurred with these findings in a study involving 437 colleges and the American College Testing Program (ACT). The study showed that the median correlation between self-reported grades and actual college grades was 54% while the median correlation between actual college grades and ACT tests was 48%.

Holmes and Tyler (1968) conducted a study in which they found that students' self-rankings with respect to their peers in areas relating to academic ability were better predictors of college grade point average than academic achievement tests. By utilizing simple self-ratings on a four-point scale covering leadership ability and writing ability, Holland and Nichols (1964) showed that
these ratings were often better predictors of future college achievement than the Scholastic Aptitude Test (SAT) scores, personality scales and interest scales. Cole (1969) discovered that self-reported high school grades were better than the American College Testing Program (ACT) scores as predictors of actual grade point averages in areas representing 304 out of 417 courses.

The predictive power of high school grades combined with high school rank-in-class and the Scholastic Aptitude Test (SAT) score were examined by Sedlacek (1972) at the University of Maryland. His findings confirmed that the high school grade was the best predictor of freshman grades and that there was no significant difference in freshman grade prediction with respect to ethnicity.

The results of a study conducted by Clewell and Joy (1988) to describe the pool of National Hispanic Scholar Awards Program applicants (1983-1984) indicated that the best single predictor of first year grades was the high school grade point average. Other variables having an impact on first year college grades were Scholastic Aptitude Test (SAT) scores and a major in science areas such as mathematics and computer science.

In a study involving a non-traditional health-related institution (Tan, 1991), data on 2,065 students from Palmer College of Chiropractic were extracted from the college data bases. Of this number, 709 cases were eliminated due to missing data resulting in a sample of 1,265 students. The students' entering grade point averages were compared to cumulative grade point averages earned while attending the institution. Findings of the study indicated that 49.2% of the
students entering the institution with grade point averages of 2.59 or less on a 4.00 scale earned cumulative grade point averages of 2.59 or less while at the institution. Similarly, 35.9% of those students entering school with a grade point average of 2.60 to 2.88 earned cumulative grade point averages in the same range while attending Palmer. 31.9% of the students entering the institution with grade point averages between 2.89 and 3.21 earned cumulative grade point averages between 2.89 and 3.21 while attending the institution, and 51.6% of those students entering the institution with a grade point average between 3.22 and 4.00 earned cumulative grade point averages in the same range while attending the institution. Students entering the institution within particular grade point average quartiles tended to attain cumulative grade point averages within the same quartile while attending the institution.

A study conducted on a random sample consisting of 25% of the 1963 entering freshman class at the University of New Mexico found a significant relationship between high school grades and the length of stay at the university (Winther, 1969). Black (1969) utilized the variables of high school grades and scores from The American College Testing (ACT) English test, ACT math test, ACT social studies test, and the ACT natural science test on a sample of 97 freshmen and 48 sophomores in an effort to determine how well they could predict academic achievement. He concluded that the high school grades and the
ACT English test were accurate predictors of both academic achievement and dropout potential at the freshman and sophomore levels of student classification.

**Research Related to Student Persistence**

Unlike the identification of variables such as high school grades which, according to various research studies, are predictive of scholastic achievement in the college environment, the identification of variables related to and predictive of student persistence in college is a more complex process due to the numbers, types and interactions of variables potentially related to the topic. According to Cope and Hannah (1975, p. 8), "Even research designed specifically to identify factors associated with withdrawal from college, while helpful, provides surprisingly meager information: findings are often contradictory and seldom illuminate the sources of difficulty for either the student or the college."

Early studies on the topic of student persistence involved compilations of descriptive statistics collected by the United States Department of Education in 1931 and 1932 showing attrition rates for 25 universities (McNeely, 1939). A comprehensive analysis of the results of 35 attrition studies was conducted by John Summerskill (1962). From his study, Summerskill identified variables descriptive of student non-persistence which included high school grades, family socioeconomic status, hometown location, motivation variables, personal adjustment abilities, illness and injury factors, and gender.

In the fall of 1966, Alexander Astin began a study involving the collection of data on 243,156 first-time, full-time students enrolled in 358 two-and-four-year
colleges and universities. The data collection and analysis of the characteristics of college freshmen have continued to the present time.

The publication of Astin's study (1975) on the characteristics of the enrolling freshman class of 1968 established him in the forefront of student persistence research. The study, released in 1975, coincided with the downturn in the 18-21 year old population and the subsequent downturn in the number of first-time, full-time freshmen entering college. Astin's study spanned a four-year time-frame from 1968 to 1972. His efforts resulted in the identification of 110 variables potentially related to the students' dropping out of college. Of these 110 variables, he identified 53 as significant contributors to the prediction of dropping out. Among the greatest predictive variables in the study were those of the students' past academic record and academic ability as well as the educational levels of the parents. From his findings, Astin recommended collection of additional demographic, biographical and academic data for follow-up research at different time intervals associated with the same students. By the fall of 1989, Astin, Korn and Berz (1989) managed to collect data on 216,362 first-time, full-time students in 403 of the nation's colleges and universities utilizing the Student Information Form (SIF). The data are utilized in longitudinal studies of students' characteristics and retention and attrition trend analysis.

Cope and Hannah (1975) noted that although men and women drop out of college at approximately the same rate, the reasons for dropping out often differ between genders. They observed that men frequently cited reasons for dropping
out related to lack of interest, competence, adequacy and identity searching. Women, on the other hand, frequently dropped out because of intellectual-aesthetic and social reasons which included dating and marriage.

In a series of case studies related to students dropping out of college, Pitcher and Blaushild (1970) contended that nonacademic contributing causes to dropping out may include difficulty encountered by the student in the emotional and physical adjustments required for the transition from high school to college. They stressed the fact that students entering college are in a critical stage of development both physically and emotionally, and the college entry experience tends to heighten emotional stress frequently leading to physical problems.

In a comprehensive study of student retention, Lenning, Beal and Sauer (1980) grouped certain characteristics linked to student retention. The characteristics were grouped into three main categories: student characteristics, environmental characteristics and interactions between the student and the institution. Grouped within the student characteristics were academic factors that included high school grade and rank-in-class as well as academic aptitude. Demographic factors that included age, gender, socioeconomic status, ethnicity and hometown location were also considered as student characteristics. The student characteristics grouping also included variables related to student motivation and aspiration as well as financial factors related to the students' concern about finances. The environmental characteristics grouping of factors, related to retention, included on campus housing, counseling services, academic
advising, orientation programs, and student involvement. The classification list of Lenning, Beal and Sauer portrayed both positive and negative factors related to retention.

Based upon extensive research, Hossler (1984) formed three major categories of variables that he felt were related to student persistence. The major categories of variables included: (a) student qualities at the time of matriculation, (b) institutional traits or qualities, and (c) the experiences of the students after matriculation. The first category, student qualities at the time of matriculation, consisted of variables related to gender, ethnicity, family income level, parents’ education level, family encouragement, residence characteristics, student personality factors such as self-confidence and self-concept, aspirations and motivations, emotional stability, motivation, and high school experiences.

Spady’s model of student retention (1970), which established the importance of the social factors associated with student withdrawal, was further defined and simplified by Tinto (1975) as he distinguished between the social and academic integration of the student into the university environment. Tinto also stressed the importance of the background characteristics that students possess at the time of enrollment in the persistence process. Over the past 15 years Tinto’s retention model has been tested and verified in many different university settings (Von-Destinon, 1988; Alexander, 1982; Fox, 1986; Stage, 1989; Allen, 1989; Cash and Bissel, 1985; Stage and Richardson, 1985; Cabrera, 1990; Getzla, 1984).
Economic and non-economic variables related to college persistence were examined in a study consisting of 1,375 college students at public four-year institutions (Cabrera, 1990). The study confirmed Tinto's (1975) social and academic integration model of retention and indicated that the ability of the student to pay was directly related to persistence. Finances and family support emerged as the critical factors contributing to student persistence in a study involving Chicano students at the University of Arizona (Von-Destinon, 1988).

One study, linking student persistence to the students' ability in mathematics, involved a sample of 188 freshmen, 141 sophomores and 236 junior nursing students at a four-year institution. The study showed that the persisting freshmen had higher American College Test Math and composite sub-scores as well as higher high school grades than did the non-persisting freshmen (Benda, 1991). Another study conducted at the University of North Dakota (Van-Erdewyk, 1967) revealed that male students who persisted through the freshman year had significantly higher mean ACT mathematics scores than the freshman dropouts.

Students' competitiveness, motivation and commitment have also been associated with persistence. A four-year follow-up study of the freshman class of 1973 at the State University of New York at Buffalo found that dropouts rated themselves lower on self-assessment traits such as competitiveness, self-discipline and dependability when compared to those students who persisted (Coles, 1981). Foster (1976) found that commitment, motivation and high school grades were
strong indicators of persistence among freshmen engineering students. Nora (1990) confirmed that the initial commitment of the student was vital to persistence in her work with underprepared community college students.

Edward "Chip" Anderson, Director of Preparatory Programs - University of California at Los Angeles, has identified an extensive list of student characteristics necessary for academic achievement and persistence in college (Anderson, 1990). He cites personal attributes that include motivation to achieve, commitment to achieve, confidence and stability, and interpersonal skills as key variables in the academic success and persistence of the student. Anderson also defines a category of persistence-related variables which he calls personal resources. These variables include the health of the student which indicates whether or not the student has the physical strength and energy necessary to meet the demands required in the achievement process. Moreover, personal resources include those of a financial nature which allows for the maximizing of the academic and social integration process. In addition to personal attributes and personal resources, Anderson has identified certain adaptation abilities related to academic success and persistence. These adaptation abilities include traits commonly associated with emotional health such as frustration and tolerance levels. Anderson also cites abilities or skills in the area of communications (speaking and writing clearly) as key to academic success and persistence.

David Shroyer, Director of Developmental Education at the University of New Orleans, cites leadership skills as a powerful retention predictor for
academically underprepared students (1988). The Campus Life Student Organization (CLSO) gives incoming freshmen students the opportunity to develop leadership skills through activities such as heading committees and participating in leadership training courses. The retention rate for the students within the voluntary CLSO program ranges from six to eight times better than the rate for non-enrolled, similarly underprepared students.

A survey instrument of 75 items was designed and administered to a random sample of the 1979 entering freshman class at the University of Kansas (Paschke, 1981). The instrument utilized a composite of Astin's (1975) dropout-related variables and variables designed to measure the students' level of social and academic comfort based upon perceptions of background experiences. The study revealed that dropouts tended to be more pessimistic about their perceived abilities in the academic as well as social areas.

A study, consisting of a sample of 2,790 freshmen enrolled in seven urban and suburban, public and private high school systems in New York state, was conducted in 1967 (Shea and Rehberg, 1973). A questionnaire was administered to the students at different time-frames including the end of the freshman year, end of the sophomore year, end of the senior year, and one year after graduation. The questionnaire contained variables related to students' personality, attitudes, and length of school career. The findings of the study indicated that individuals who attended four-year colleges tended to exhibit a higher mean on the selected variables than students who attended two-year institutions. Similarly, the students
who attended the two-year institutions had a higher mean on the variables than those students who only graduated from high school. Furthermore, the high school graduates had a higher mean score on the variables than high school dropouts. The study suggests that variables related to student attitude, student values and student personality can be utilized to predict the length of formal education.

**Summary and Implications**

Much information exists and continues to expand in an effort to distinguish the characteristics of students that persist in college from those who do not. This chapter provides a survey of the literature related to student persistence in college along with student characteristics and attributes that have been identified as indicators of persistence and non-persistence.

Colleges and universities have been slow to address the problem of student attrition although research has shown that the national attrition rate has held constant for the last half of a century. The decrease in the number of high school graduates entering college combined with the high cost of recruitment now places more emphasis on retaining students once they have entered college. However, keeping students in college is not just a matter of the students maintaining satisfactory grade point averages. An escalating body of empirical evidence describes a majority of non-persisters as academically eligible at the time of departure from their institution.
Retention experts believe that the decision of the student to leave the college or university is made early in the initial semester of attendance. This short time-frame affords a narrow window of opportunity for administrators to identify and intervene in an effort to retain these students (Noel, Levitz and Saluri, 1987). Early identification of dropout-prone students is not an easy task due to the type and availability of data in function-orientated university data bases. Research indicates that students report data about themselves with a high degree of accuracy when compared to official records. The data collection and analysis process may be shortened by the use of a student self-assessment questionnaire.

The scholastic or academic influences related to student persistence are reflected in the students' grade point average. In order to remain in the university a student must maintain a sufficient grade point average in his or her coursework. Studies have revealed that academic success at the high school level indicates a strong potential for academic success at the collegiate level.

Although maintaining satisfactory grades are necessary for the student to remain in college, they are not sufficient enough to guarantee that a student will persist. Retention experts point to the fact that growing numbers of students leave their institution while in good academic standing. Research associated with student persistence reveals a complex, multivariate set of attributes related to a student's staying or leaving the university environment.
A student's entry into college consists of transition and change for that student. Variables associated with the student's ability or perceived ability to integrate into a social, academic, and physical environment different from that of high school have been identified in persistence studies.

A composite of those variables identified as related to and predictive of the student's scholastic success in college includes high school grades, self-ratings in academic ability areas (including leadership ability and writing ability), ACT test scores, high school rank in class, and SAT test scores. The high school grade of the student is most often cited as the best predictor of collegiate scholastic success.

Variables that are related to and predictive of student persistence, according to research studies, include high school grades, distance from home, motivation to achieve, physical and emotional health, parent's educational levels, parent's income, social and intellectual self-confidence, mathematical ability, speaking and writing ability, and leadership ability.

A method for the early identification of freshmen students who are most likely to leave the institution as well as those who are most likely to stay should be beneficial to the university. At a time when student recruitment is becoming more competitive and more costly due to the shrinking pool of enrolling freshmen, the university needs to explore new ways of identifying and retaining at risk students already enrolled.
CHAPTER III

PROCEDURES OF THE STUDY

Introduction

In order to fulfill the purposes of this study, methods and procedures were used to collect the descriptive data from full-time, first-time freshmen students before their entry into a formal classroom setting. This chapter provides a detailed description of the methods and procedures utilized in the data collection and analysis process. Included in this chapter are sections on (a) a description of the survey instrument, (b) a description of the population, (c) the techniques involved in the data collection, and (d) data analysis procedures.

The Survey Instrument

The instrument is the Student Information Form (SIF) designed and developed for use in the collection of data to support the Cooperative Institutional Research Program (CIRP). CIRP was initiated in 1966 and is sponsored by the American Council on Education (ACE) and the Graduate School of Education at the University of California, Los Angeles.

The SIF questionnaire is administered annually in order to collect standard biographic and demographic as well as research-oriented attitudinal and self-rated ability data on students who attend colleges and universities as first-time, full-time students. The major emphasis of CIRP, through the SIF questionnaire, is the
collection of data for longitudinal research. These data have also been used as input for major studies in the identification of characteristics of dropouts (Astin, 1975).

The SIF questionnaire was developed in collaboration with experts in the areas of educational research, educational administration, policy making, and government. Input for the questionnaire was also obtained from participating colleges and universities as well as students. The SIF is reviewed on an annual basis for content validity and revised in order to reflect the changing academic and social environments (Astin, Korn and Berz, 1989).

The SIF questionnaire consists of student identification information such as name, address, date-of-birth as well as the student's social security number. The questionnaire contains 38 standard questions relating to biographic and demographic background characteristics of the student as well as academic and social ability self-ratings and questions relating to the student's attitude. In addition to the 38 standard questions, there are 10 optional questions which may be developed by the individual college or university participating in the CIRP study. The questionnaire was designed to be self-administered under proctored conditions and scanned onto a magnetic tape with a mark reflex reader.

For the purposes of this study, a subset of the student responses provided by the SIF questionnaire were utilized to form the input variables on a Likert-type scale for the classification of the students into the four mutually exclusive groups: (a) HIGH GPA/RETAIN, (b) HIGH GPA/DROP, (c) LOW
GPA/RETAIN, and (d) LOW GPA/DROP related to scholastics and persistence. The subset of SIF item responses chosen for the classification model consist of a composite of those variables identified in the literature, according to research studies, related to and highly predictive of the student's academic success and persistence in the collegiate environment.

The independent variables utilized for the classification model consist of:

I. Academic background
   A. Average grade in high school- SIF item 7

II. Academic and social self-ratings with respect to peers- SIF item 25
   A. Academic ability
   B. Competitiveness
   C. Drive to achieve
   D. Emotional health
   E. Leadership ability
   F. Mathematical ability
   G. Physical health
   H. Popularity with the opposite sex
   I. Public speaking ability
   J. Self-confidence (intellectual)
   K. Self-confidence (social)
   L. Writing ability
III. Family background

A. Father’s educational level- SIF item 27

B. Mother’s educational level- SIF item 27

C. Miles from home-SIF item 6

D. Parent’s gross income level-SIF item 26

The categorical classification groups (dependent variables) for the model consist of:

1. HIGH GPA/RETAIN GROUP

2. HIGH GPA/DROP GROUP

3. LOW GPA/RETAIN GROUP

4. LOW GPA/DROP GROUP

The student’s social security number and gender were also obtained from the SIF questionnaire.

Population of the Study

The population of the study consisted of 1,059 first-time, full-time freshmen students enrolled at Texas Christian University in the fall semester of 1990. This number represented the official freshman enrollment of 1,140 minus those students whose SIF questionnaire data could not be matched to the official enrolled data set due to missing or erroneous social security numbers in the SIF data set.
Procedures for Data Collection

The SIF questionnaire was completed by the entering freshmen students during three orientation sessions in the summer of 1990. The questionnaire administration was proctored by university staff through the campus housing organization. All freshmen students were required to complete the SIF questionnaire prior to their official registration during one of the three summer orientation sessions.

The SIF questionnaires were collected after each orientation session and edited for stray marks on the scannable forms. After the final orientation session, the SIF questionnaires were assimilated into one group and mailed to the CIRP office at the University of California in Los Angeles, California.

The SIF questionnaires were scanned and a machine-readable file was created by CIRP containing data for each student who had filled out the questionnaire. This file was returned to Texas Christian University and uploaded to the IBM computer mainframe. A Statistical Analysis System (SAS) program was written to read the records on the file and create a subset file. The subset file consisted of only those responses to the questions (variables) identified as input variables for the classification model of the study. The students' gender and social security numbers were also added to this data set which contained 1,059 student records.

During the fall semester of 1991, another data set was created from the Student Record System (SRS) of the University. This data set contained data
related to the fall 1990 enrolled freshman class of 1,140 students. The data set contained social security numbers, cumulative grade point averages earned at Texas Christian University from the fall of 1990 to the fall of 1991, an indicator to distinguish between retained and non-retained students from the fall 1990 semester to the fall 1991 semester. This data set was then matched to the SIF subset of data to create the final data set used in the study. The final data set contained 1,059 student’s SIF questionnaire data as well as cumulative grade point averages earned while attending the university over a one-year time interval and a retain or non-retain indicator for the same one-year time interval.

Procedures for Analysis of Data

All statistical analysis of the study data were performed within the Statistical Analysis System (SAS) software package version 6.1 (Sas Institute, Inc., 1986). The study measured the independent variables by means of a scale score which relates to the extent and characteristics of the student’s persistence and scholastic ability during the first year of college. The dependent variables consisted of the four mutually exclusive categorical classification groups (a) HIGH GPA/RETAIN, (b) HIGH GPA/DROP, (c) LOW GPA/RETAIN, and (d) LOW GPA/DROP. All significance tests were conducted at the .05 level (Kachigan, 1986).

Measures of correlation between the independent variables and the dichotomous dependent variables of (a) high and low grade point averages, and
(b) retain and drop were calculated utilizing the Pearson Product Moment Correlation statistical procedure.

F tests of significance were utilized within the Stepwise Multivariate Discriminant Analysis procedure to identify the independent variables which were significant in the placement of the students into one of the four categorical classification groupings. Differences with respect to gender, classification group and the differentiating independent variables were also examined within this procedure by means of the F test for significance.

Finally, a classification matrix (confusion matrix) was developed utilizing the Discriminant Analysis procedure. From this matrix, the predicted group membership within one of the four mutually exclusive classification groups, based upon the independent variables, was compared to the membership within the group based upon actual grade point average and retain/drop indicators. A chi-square test of significance was utilized within this procedure.
CHAPTER IV

ANALYSIS OF DATA

Introduction

This chapter contains an analysis of data collected from the Student Information Form (SIF) and data from the Student Record System (SRS) at Texas Christian University. The SIF data were collected in the proctored sessions in which the entering freshmen for the fall 1990 semester were required to complete the questionnaire prior to official registration for classes. Ninety-three percent of the fall 1990 entering freshman class (N = 1140) were included in the population study (N = 1059). The remaining seven percent of the entering freshmen were eliminated from the study due to missing or erroneous social security numbers. The data from the fall 1990 SIF questionnaire were combined with data from the fall 1991 Student Record System at Texas Christian University by means of a match and merge process dependent upon the students' social security numbers. The resulting data set for the study contained data from the fall 1990 SIF questionnaire as well as one-year persistence indicators and grade point averages obtained at Texas Christian University from the fall of 1990 to the fall of 1991 for the entering fall 1990 freshman class.

The purposes of this study were as follows: (a) to classify the entering freshman class into four mutually exclusive groups: HIGH GPA/RETAIN, HIGH
GPA/DROP, LOW GPA/RETAIN, and LOW GPA/DROP based upon an array of self-reported and actual variables; (b) to compare the relationships among groups with respect to scholastics and persistence; and (c) to determine if there were significant differences between genders in the four groups with respect to the variables that classified them into their respective groups.

Four research questions were investigated which relate to the classification of college freshmen according to scholastic and persistence potential.

1. Which variables are significantly related to freshmen students' scholastic ability and persistence?

2. Do these variables significantly add to the differentiation of students with respect to scholastic ability and persistence?

3. Is there a significant difference between genders within the same group with respect to the differentiating variables?

4. Is the accuracy of classifying students into these groups on the basis of the variables statistically significant when compared to the classification based upon actual scholastic and persistence data?

The analysis of data in this chapter is presented by each specific purpose of the study. The responses of the students and significant differences among student groups are described in relation to the four research questions.

This chapter is divided into three major sections. The first section consists of demographic data which describe the population of the study with respect to classification groupings as determined from actual grade point averages and the
persistence indicators for retained and dropped students by gender categories.
The second section describes the extent of the relationships among the
independent variables (Appendix A) utilized to classify the students and
scholastic and persistence potential. Analytical data are presented for each of the
four classification groups. The analysis identifies the contribution of the variables
toward the classification of the students into the four mutually exclusive
groupings based upon scholastics and persistence. In addition, the analysis
identifies differences between genders within the same classification group and
compares the accuracy of classification based upon actual grade point average and
persistence indicators with the classification based exclusively upon the
independent variables. The .05 level of significance was utilized in all analysis.
Section three consists of the critical highlights of the data analysis.

Demographic Data

Included in this section are demographic data from the population of the
study. The variables described consist of classification groupings based upon
actual grade point average and persistence indicators of retain versus drop by
gender.

The population of the study (N = 1059) by the type of classification and by
gender is shown in Table 1. These data respond to the first purpose of the study
which was to classify the entering freshman class into four mutually exclusive
groups based upon scholastics and persistence.
Table 1

**Population of the Study by Type of Classification Group and by Gender Based Upon Actual Grade Point Average and Persistence Indicators**

<table>
<thead>
<tr>
<th>Variable: Group by Gender</th>
<th>High GPA Retain</th>
<th>High GPA Drop</th>
<th>Low GPA Retain</th>
<th>Low GPA Drop</th>
<th>Total Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N % Total (Column)</td>
<td>N % Total (Column)</td>
<td>N % Total (Column)</td>
<td>N % Total (Column)</td>
<td>N % Total (Column)</td>
</tr>
<tr>
<td>Female</td>
<td>425 59.52</td>
<td>100 61.35</td>
<td>38 45.78</td>
<td>43 43.43</td>
<td>606 57.22</td>
</tr>
<tr>
<td>Male</td>
<td>289 40.48</td>
<td>63 38.65</td>
<td>45 54.22</td>
<td>56 56.57</td>
<td>453 42.78</td>
</tr>
<tr>
<td>Total</td>
<td>714 100.00</td>
<td>163 100.00</td>
<td>83 100.00</td>
<td>99 100.00</td>
<td>1059 100.00</td>
</tr>
</tbody>
</table>

Analysis of the data reveals that, of the total population of the study (N = 1059), 714 students were classified into the HIGH GPA/RETAIN group. Within this group (N = 714), 425 or 59.52% were female students while 289 or 40.48% were male students. The HIGH GPA/DROP group consisted of 163 students of the total population (N = 1059). Of this group (N = 163), 100 students or 61.35% were female while the gender category of male consisted of 63 students representing 38.65%. There were 83 students classified into the LOW GPA/RETAIN group. Female students within this group (N = 83) totaled 38 or
45.78% while there were 45 male students representing 54.22%. The fourth classification group, LOW GPA/DROP, consisted of 99 students. This group \((N = 99)\) contained 43 females representing 43.43% of the group while there were 56 males which accounted for 56.57% of the group. Collectively, female students accounted for 606 of the total population of the study \((N = 1059)\) or 57.22% while male students accounted for the remaining 42.78% with a total of 453 students.

Data in Tables 2, 3, 4, and 5 respond to the first research question that asks, "which variables are significantly related to the freshmen students' scholastic ability and persistence?" Data corresponding to variables which significantly correlate with scholastics within the study population are presented in Table 2. Examination of these data indicates that the average grade in high school along with the students' self-assessment of their academic ability were the top ranked positive correlates with the actual grade point average. Review of these data also reveal that, of the remaining fifteen variables which comprise the classification model (see Appendix A for a complete listing of the classification model variables), the father's educational level, miles from the student's home, mother's educational level, the student's self-assessment of mathematical ability and drive to achieve were also significantly correlated with grade point average.

Data related to the classification model variables which significantly correlate with scholastics by gender are provided in Table 3. Examination of the data shows that the average grade in high school was the highest ranked correlate
with scholastics for the males \( (N = 453) \). In addition, the average grade in high school was the second highest ranked variable which correlates with scholastics for the males. Moreover, both females and males shared academic ability and the father’s educational level as significant correlates with scholastic ability.

Differences between females and males with respect to variables significantly correlated with scholastics are also provided in Table 3. Females differed from males in that the variables related to physical health, the mother’s educational level, the father’s age, and family income differ significantly from females.

Table 2

**Ranked Correlations of Classification Model Variables with Scholastics**

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.A.</td>
<td>1</td>
<td>Average Grade in High School</td>
<td>0.21 ***</td>
</tr>
<tr>
<td>II.A.</td>
<td>2</td>
<td>Academic Ability</td>
<td>0.14 ***</td>
</tr>
<tr>
<td>II.C.</td>
<td>7</td>
<td>Drive to Achieve</td>
<td>0.06 **</td>
</tr>
<tr>
<td>II.F.</td>
<td>6</td>
<td>Mathematical Ability</td>
<td>0.07 **</td>
</tr>
<tr>
<td>III.A.</td>
<td>3</td>
<td>Father’s Educational Level</td>
<td>0.11 ***</td>
</tr>
<tr>
<td>III.B.</td>
<td>5</td>
<td>Mother’s Educational Level</td>
<td>0.08 **</td>
</tr>
<tr>
<td>III.C.</td>
<td>4</td>
<td>Miles From Home</td>
<td>0.10 ***</td>
</tr>
</tbody>
</table>

*See Appendix A for a Complete List of Classification Model Variables

**p < .05

***p < .01
Table 3

Ranked Correlations of Classification Model Variables with Scholastics by Gender

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>I.A.</td>
<td>1</td>
<td>Average Grade in High School</td>
<td>0.23 ***</td>
</tr>
<tr>
<td>II.A.</td>
<td>2</td>
<td>Academic Ability</td>
<td>0.13 ***</td>
</tr>
<tr>
<td>III.A.</td>
<td>3</td>
<td>Father's Educational Level</td>
<td>0.11 ***</td>
</tr>
<tr>
<td>II.G.</td>
<td>4</td>
<td>Physical Health</td>
<td>0.10 ***</td>
</tr>
<tr>
<td>III.B.</td>
<td>5</td>
<td>Mother's Educational Level</td>
<td>0.09 **</td>
</tr>
<tr>
<td>II.J.</td>
<td>6</td>
<td>Self-Confidence (Intellectual)</td>
<td>0.08 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>III.C.</td>
<td>1</td>
<td>Miles from Home</td>
<td>0.19 ***</td>
</tr>
<tr>
<td>I.A.</td>
<td>2</td>
<td>Average Grade in High School</td>
<td>0.19 ***</td>
</tr>
<tr>
<td>II.A.</td>
<td>3</td>
<td>Academic Ability</td>
<td>0.17 ***</td>
</tr>
<tr>
<td>III.A.</td>
<td>4</td>
<td>Father's Educational Level</td>
<td>0.11 **</td>
</tr>
<tr>
<td>II.F.</td>
<td>5</td>
<td>Mathematical Ability</td>
<td>0.09 **</td>
</tr>
</tbody>
</table>

*See Appendix A for a Complete List of Classification Model Variables

***p < .01

**p < .05
scholastics for the females \((N = 606)\) of the study population \((N = 1059)\) while the variable relating to miles from home was the highest ranked correlate with level, and intellectual self-confidence were significantly correlated with scholastics for this gender while the males reflected a significant correlation between mathematical abilities and scholastics.

Data related to the classification model variables which exhibit significant correlations with persistence are presented in Table 4 for the population study \((N = 1059)\). Analysis of these data indicates that both of the parent's educational level as well as the parent's gross income level were significantly related to the student's persistence. The educational level of the mother was the top ranked correlate with persistence and was followed by the father's educational level and finally the parent's gross income level.

Table 4

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>II.B.</td>
<td>1</td>
<td>Mother's Educational Level</td>
<td>0.10 **</td>
</tr>
<tr>
<td>III.A.</td>
<td>2</td>
<td>Father's Educational Level</td>
<td>0.09 ***</td>
</tr>
<tr>
<td>III.D.</td>
<td>3</td>
<td>Parent's Gross Income Level</td>
<td>0.06 **</td>
</tr>
</tbody>
</table>

*See Appendix A for a Complete List of Classification Model Variables

**\(p < .05\)**

***\(p < .01\)**
Additional data related to persistence is provided in Table 5. These data correspond to the classification model variables which correlate significantly with persistence grouped by gender. While both the mother's and father's educational levels ranked high as correlates with persistence for females (1 and 2 respectively), the highest ranking correlate with persistence for males was the parent's gross income level followed by the mother's educational level. Academic ability and the average grade in high school were also significantly correlated with persistence for the male gender.

The second purpose of the study was to compare the relationships among groups with respect to scholastics and persistence. In response to research question two which asks, "do these variables significantly add to the differentiation of students with respect to scholastic ability and persistence?", data gathered to ascertain the differentiating power of the classification model variables are presented in Tables 6, 7, and 8.

Significant discriminator variables between scholastic ability (high GPA and low GPA) groups and persistence (retain and drop) groups for the study population (N = 1059) are presented in Table 6. According to these data, the average grade in high school, father's educational level, and miles from home were significant discriminators for students between the two scholastic ability groups of high GPA and low GPA. Students within the high GPA group showed a higher group mean score on all three of the variables in comparison to the group mean scores on the same variables within the low GPA group. These data
Table 5

**Ranked Correlations of Classification Model Variables with Persistence by Gender**

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.B.</td>
<td>1</td>
<td>Mother's Educational Level</td>
<td>0.09 **</td>
</tr>
<tr>
<td>III.A.</td>
<td>2</td>
<td>Father's Educational Level</td>
<td>0.08 **</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.D.</td>
<td>1</td>
<td>Parent's Gross Income Level</td>
<td>0.14 ***</td>
</tr>
<tr>
<td>III.B.</td>
<td>2</td>
<td>Mother's Educational Level</td>
<td>0.11 **</td>
</tr>
<tr>
<td>II.A.</td>
<td>3</td>
<td>Academic Ability</td>
<td>0.11 **</td>
</tr>
<tr>
<td>I.A.</td>
<td>4</td>
<td>Average Grade in High School</td>
<td>0.09 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

**p < .05

***p < .01

also indicated that the mother's educational level and the average grade in high school were significant discriminators between the two persistence groups of
retain and drop students. The mean scores for the retain group were higher on both variables in comparison to the mean scores for the drop group.

Significant discriminator variables between the retain and drop groups for the same gender are presented in Table 7. Examination of these data reveals the most significant discriminator variable between females in the retain group compared to females in the drop group as the mother's educational level. The mean score of the mother's educational level for the retain group of females was higher at 3.577 when compared to a mean score of 3.357 for the mother's educational level of the females in the drop group. In contrast, two of the variables were significant discriminators between males in the retain and drop groups. The two significant discriminators between males were the parent's gross income and the average grade in high school. The mean score for the parent's gross income within the retain group for males was 3.344 as compared to a mean score for the parent's gross income for males in the drop group of 2.891. Analysis of these data also reveals a mean score of 3.982 for males in the retain group on the average grade in high school while males in the drop group reflected a mean score of 3.756 for the same discriminator variable.

Significant discriminator variables between the high GPA and low GPA groups for the same gender are presented in Table 8. Females in the high GPA and low GPA groups were differentiated by their average grade in high school (high GPA group mean = 4.190, low GPA group mean = 3.506) as well as their father's educational level (high GPA group mean = 3.939, low GPA group mean
and their physical health (high GPA group mean = 3.846, low GPA group mean = 3.605). In contrast to the females, the significant discriminator variables between high GPA and low GPA groups for males were the miles from home (high GPA group mean = 3.665, low GPA group mean = 3.050) and the

Table 6

**Significant Discriminator Variables Between Scholastic Ability (High GPA and Low GPA) Groups and Persistence (Retain and Drop) Groups**

<table>
<thead>
<tr>
<th>Classification Variable</th>
<th>Rank</th>
<th>Description</th>
<th>High GPA Group Mean</th>
<th>Low GPA Group Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.A.</td>
<td>1</td>
<td>Average Grade in High School</td>
<td>4.127</td>
<td>3.527</td>
<td>50.948 ***</td>
</tr>
<tr>
<td>III.A.</td>
<td>2</td>
<td>Father's Educational Level</td>
<td>3.896</td>
<td>3.538</td>
<td>12.216 ***</td>
</tr>
<tr>
<td>III.C.</td>
<td>3</td>
<td>Miles from Home</td>
<td>3.599</td>
<td>3.236</td>
<td>9.094 **</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classification Variable</th>
<th>Rank</th>
<th>Description</th>
<th>Retain Group Mean</th>
<th>Drop Group Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>III.B.</td>
<td>1</td>
<td>Mother's Educational Level</td>
<td>3.548</td>
<td>3.301</td>
<td>10.572 ***</td>
</tr>
<tr>
<td>I.A.</td>
<td>2</td>
<td>Average Grade in High School</td>
<td>4.058</td>
<td>3.916</td>
<td>16.845 ***</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .05

*** p < .01
Table 7

Significant Discriminator Variables Between the Retain and Drop Groups for the
Same Gender

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Retain Group Mean</th>
<th>Drop Group Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.B.</td>
<td>1</td>
<td>Mother's Educational Level</td>
<td>3.577</td>
<td>3.357</td>
<td>4.842 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.D.</td>
<td>1</td>
<td>Parent's Gross Income Level</td>
<td>3.344</td>
<td>2.891</td>
<td>8.401 ***</td>
</tr>
<tr>
<td>I.A.</td>
<td>2</td>
<td>Average Grade in High School</td>
<td>3.982</td>
<td>3.756</td>
<td>5.315 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .05

*** p < .01

average grade in high school (high GPA group mean = 4.031, low GPA group mean = 3.545).

Purpose three of the study was formulated to determine if there were significant differences between genders in the classification groups with respect to the variables that classified them into their respective groups. Analyses of data in Tables 9, 10, 11, 12, 13, and 14 respond to this specific purpose.
Table 8

**Significant Discriminator Variables Between the High GPA and Low GPA Groups for the Same Gender**

<table>
<thead>
<tr>
<th>Classification Rank</th>
<th>Description</th>
<th>High GPA Mean</th>
<th>Low GPA Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.A. 1</td>
<td>Average Grade in High School</td>
<td>4.190</td>
<td>3.506</td>
<td>32.367 ***</td>
</tr>
<tr>
<td>III.A. 2</td>
<td>Father's Educational Level</td>
<td>3.939</td>
<td>3.568</td>
<td>6.025 **</td>
</tr>
<tr>
<td>II.G. 3</td>
<td>Physical Health</td>
<td>3.846</td>
<td>3.605</td>
<td>4.256 **</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.C. 1</td>
<td>Miles From Home</td>
<td>3.665</td>
<td>3.050</td>
<td>16.724 ***</td>
</tr>
<tr>
<td>I.A. 2</td>
<td>Average Grade in High School</td>
<td>4.031</td>
<td>3.545</td>
<td>16.845 ***</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .05
*** p < .01

Table 9 contains the significant discriminator variables between genders for the retain and drop groups. According to these data, there were five significant discriminator variables between males and females in the retain group. The five
variables, in rank order, included competitiveness, self-confidence (intellectual),
drive to achieve, popularity with the opposite sex, and the average grade in high
school. The males in the retain group exhibited higher mean scores on four of
the five discriminator variables when compared to the mean scores for females on
the same discriminator variables. Females of the retain group showed a higher
mean score than males of this group (4.114 to 3.982) on the single discriminator
variable of average high school grade. In addition, these data revealed five
significant discriminator variables between males and females in the drop group.
The discriminator variables, in rank order, included competitiveness, the average
grade in high school, self-confidence (intellectual), drive to achieve, and
emotional health. Males of the drop group reflected higher mean scores on three
of the five discriminator variables. Females of this group showed a higher mean
score than males on the discriminator variables of average grades in high school
(4.049 to 3.756) and drive to achieve (4.105 to 4.067). The variable of popularity
with the opposite sex appeared as a significant discriminator variable in the retain
group but not in the drop group while the variable of emotional health appeared
as a significant discriminator variable in the drop group but not in the retain
group.

A listing of rank ordered, significant discriminator variables between
genders for the high GPA and low GPA groups is presented in Table 10.
Analysis of these data indicates that six of the variables were significant
discriminators between males and females in the high GPA group. In this group,
Table 9

**Significant Discriminator Variables Between Genders for the Retain and Drop Groups**

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Female Mean</th>
<th>Male Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Retain Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Drop Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.B.</td>
<td>1</td>
<td>Competitiveness</td>
<td>3.713</td>
<td>4.126</td>
<td>48.410 ***</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Competitiveness</td>
<td>3.636</td>
<td>4.134</td>
<td>21.942 ***</td>
</tr>
<tr>
<td>II.J.</td>
<td>2</td>
<td>Self-Confidence (intellect)</td>
<td>3.583</td>
<td>3.946</td>
<td>13.969 ***</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Average Grade in High School</td>
<td>4.049</td>
<td>3.756</td>
<td>8.987 ***</td>
</tr>
<tr>
<td>II.C.</td>
<td>3</td>
<td>Drive to Achieve</td>
<td>4.073</td>
<td>4.102</td>
<td>22.766 ***</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Self-confidence (intellect)</td>
<td>3.580</td>
<td>4.042</td>
<td>13.697 ***</td>
</tr>
<tr>
<td>II.H.</td>
<td>4</td>
<td>Popularity with Opposite Sex</td>
<td>3.428</td>
<td>3.731</td>
<td>7.136 ***</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Drive to achieve</td>
<td>4.105</td>
<td>4.067</td>
<td>4.642 **</td>
</tr>
<tr>
<td>I.A.</td>
<td>5</td>
<td>Average Grade in High School</td>
<td>4.114</td>
<td>3.982</td>
<td>4.171 **</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Emotional Health</td>
<td>3.790</td>
<td>4.134</td>
<td>6.633 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .05

*** p < .01
Table 10

Significant Discriminator Variables Between Genders for High GPA and Low GPA Groups

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Female Mean</th>
<th>Male Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High GPA Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.B.</td>
<td>1</td>
<td>Competitiveness</td>
<td>3.705</td>
<td>4.148</td>
<td>59.744 ***</td>
</tr>
<tr>
<td>II.C.</td>
<td>2</td>
<td>Drive to Achieve</td>
<td>4.103</td>
<td>4.116</td>
<td>17.165 ***</td>
</tr>
<tr>
<td>II.J.</td>
<td>3</td>
<td>Self-Confidence (intellect)</td>
<td>3.611</td>
<td>3.980</td>
<td>24.941 ***</td>
</tr>
<tr>
<td>I.A.</td>
<td>4</td>
<td>Average Grade in High School</td>
<td>4.190</td>
<td>4.031</td>
<td>8.419 ***</td>
</tr>
<tr>
<td>II.F.</td>
<td>5</td>
<td>Mathematical Ability</td>
<td>3.213</td>
<td>3.443</td>
<td>5.945 **</td>
</tr>
<tr>
<td>II.H.</td>
<td>6</td>
<td>Popularity with Opposite Sex</td>
<td>3.438</td>
<td>3.739</td>
<td>4.279 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low GPA Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.J.</td>
<td>1</td>
<td>Self-confidence (intellect)</td>
<td>3.395</td>
<td>3.941</td>
<td>17.576 **</td>
</tr>
<tr>
<td>II.G.</td>
<td>2</td>
<td>Physical Health</td>
<td>3.605</td>
<td>4.050</td>
<td>9.565 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .05

*** p < .01

males differed from females on competitiveness, drive to achieve, self-confidence (intellectual), average grade in high school, mathematical ability, and popularity
with the opposite sex. Males of the high GPA group showed a higher mean score on five of the six discriminator variables. Females of the high GPA group showed a higher mean score than males on the single discriminator variable of average grade in high school (4.190 to 4.031). In contrast to the high GPA group, only two variables appeared as significant discriminator variables between genders for the low GPA group. These variables consisted of self-confidence (intellectual) and physical health. Males of this group showed higher mean scores for both of the discriminator variables when compared to the females.

Significant discriminator variables between genders within the HIGH GPA/RETAIN classification group are presented in Table 11. Males were distinguished from females within this group on competitiveness, drive to achieve, self-confidence (intellectual), and popularity with the opposite sex. The mean scores for males on all four of the discriminator variables were higher when compared to the mean scores on the variables for the female gender.

The significant discriminator variables between genders within the HIGH GPA/DROP classification group are presented in Table 12. The three variables of competitiveness, average grade in high school, and self-confidence (intellectual) were significant discriminators between males and females within the HIGH GPA/DROP group. Males of this group showed higher mean scores than females on all three of the discriminator variables.
### Table 11

**Significant Discriminator Variables Between Genders Within the High GPA Retain Group**

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Female Mean</th>
<th>Male Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.B.</td>
<td>1</td>
<td>Competitiveness</td>
<td>3.713</td>
<td>4.142</td>
<td>46.161 ***</td>
</tr>
<tr>
<td>II.C.</td>
<td>2</td>
<td>Drive to Achieve</td>
<td>4.096</td>
<td>4.121</td>
<td>13.075 ***</td>
</tr>
<tr>
<td>II.J.</td>
<td>3</td>
<td>Self-Confidence (intellect)</td>
<td>3.614</td>
<td>3.960</td>
<td>17.390 ***</td>
</tr>
<tr>
<td>II.H.</td>
<td>4</td>
<td>Popularity with Opposite Sex</td>
<td>3.426</td>
<td>3.720</td>
<td>5.866 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .05

*** p < .01

### Table 12

**Significant Discriminator Variables Between Genders Within High GPA Drop Group**

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Female Mean</th>
<th>Male Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.B.</td>
<td>1</td>
<td>Competitiveness</td>
<td>3.670</td>
<td>4.175</td>
<td>13.520 **</td>
</tr>
<tr>
<td>I.A.</td>
<td>2</td>
<td>Average Grade in High School</td>
<td>4.230</td>
<td>3.778</td>
<td>9.444 **</td>
</tr>
<tr>
<td>II.J.</td>
<td>3</td>
<td>Self-Confidence (intellect)</td>
<td>3.600</td>
<td>4.095</td>
<td>11.171 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .01
Table 13

**Significant Discriminator Variables Between Genders Within Low GPA Retain Group**

<table>
<thead>
<tr>
<th>Classification Rank Variable *</th>
<th>Description</th>
<th>Female Mean</th>
<th>Male Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>II.E. 1</td>
<td>Leadership Ability</td>
<td>3.632</td>
<td>4.178</td>
<td>9.682 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .01

In Table 13, the significant discriminator variables between genders within the LOW GPA/RETAIN group are presented. Leadership ability was the single significant discriminator variable between males and females. Moreover, males showed a higher mean score (4.178) on leadership ability when compared to females (3.632) in this group.

The significant discriminator variables between genders within the LOW GPA/DROP group are presented in Table 14. Physical health and self-confidence (intellectual) were significant in differentiating between males and females within this group. The mean scores for females were lower on both of the discriminator variables when compared to the mean scores on the variables for the males.

Data presented in Tables 15, 16, 17, and 18 respond to the fourth research question which asks: is the accuracy of classifying the students into the mutually
exclusive groups on the basis of the variables alone statistically significant when compared to the classification based upon actual scholastic and persistence data?

Included in Table 15 is a comparison of the predicted membership in the four mutually exclusive groups of HIGH GPA/RETAIN, HIGH GPA/DROP, LOW GPA/RETAIN, and LOW GPA/DROP based upon the classification model variables and group membership based upon actual grade point average and the persistence indicators of retain and drop for the study population (N = 1059). An analysis of covariance within the groups revealed a significant chi-square statistic of 0.0001. The probability of placing a student in the correct group would be one in four or 25%. Three out of four of the mutually exclusive classification groups' predicted membership, based upon the predictor variables, Table 14

**Significant Discriminator Variables Between Genders Within the Low GPA Drop Group**

<table>
<thead>
<tr>
<th>Classification Variable *</th>
<th>Rank</th>
<th>Description</th>
<th>Female Mean</th>
<th>Male Mean</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>II.G.</td>
<td>1</td>
<td>Physical Health</td>
<td>3.489</td>
<td>4.089</td>
<td>12.659 ***</td>
</tr>
<tr>
<td>II.J.</td>
<td>2</td>
<td>Self-Confidence (Intellect)</td>
<td>3.535</td>
<td>3.982</td>
<td>6.473 **</td>
</tr>
</tbody>
</table>

* See Appendix A for a Complete List of Classification Model Variables

** p < .05

*** p < .01
Table 15

Actual vs. Predicted Classification Group Membership

<table>
<thead>
<tr>
<th>Predicted Group (Columns)</th>
<th>Actual Group (Rows)</th>
<th>High GPA Retain</th>
<th>High GPA Drop</th>
<th>Low GPA Retain</th>
<th>Low GPA Drop</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td></td>
</tr>
<tr>
<td>High GPA Retain</td>
<td>664</td>
<td>93.00</td>
<td>21</td>
<td>2.94</td>
<td>14</td>
<td>1.96</td>
</tr>
<tr>
<td></td>
<td>714</td>
<td>100.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High GPA Drop</td>
<td>113</td>
<td>69.33</td>
<td>39</td>
<td>23.93</td>
<td>6</td>
<td>3.68</td>
</tr>
<tr>
<td></td>
<td>163</td>
<td>100.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low GPA Retain</td>
<td>47</td>
<td>56.63</td>
<td>4</td>
<td>4.82</td>
<td>30</td>
<td>36.14</td>
</tr>
<tr>
<td></td>
<td>83</td>
<td>100.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low GPA Drop</td>
<td>67</td>
<td>67.68</td>
<td>1</td>
<td>1.01</td>
<td>2</td>
<td>2.02</td>
</tr>
<tr>
<td></td>
<td>99</td>
<td>100.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>891</td>
<td>84.14</td>
<td>65</td>
<td>6.14</td>
<td>52</td>
<td>4.91</td>
</tr>
<tr>
<td></td>
<td>1059</td>
<td>100.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

p = 0.0001

Chi-Square = 596.59, df = 459

when compared to the actual membership, exceeded this probability. The HIGH GPA/RETAIN group was predicted at a 93% accuracy rate or 664 out of 714 correct placements. The HIGH GPA/DROP group was the only group with less
than a 25% accuracy rate in its classifications. This group showed a 23.93% accuracy level with 39 out of 163 students correctly classified into the group. The classification variables correctly classified 30 out of 83 students in the LOW GPA/RETAIN group for an accuracy rate of 36.14%. The classification variables also correctly classified 29 out of 99 students into the LOW GPA/DROP group for an accuracy rate of 29.29%.

A matrix of actual versus predicted group membership in the four mutually exclusive groups for the female gender (N = 606) of the study population is presented in Table 16. A significant chi-square of 0.0019 was revealed through an analysis of covariance within the groups. The probability of placing a female student in the correct group was one in four or 25%. The accuracy rate based upon the predictor variables exceeded 25% for all four groups. The HIGH GPA/RETAIN group yielded a 94.12 accuracy rate with 400 out of 425 female students correctly predicted within this group. Within the HIGH GPA/DROP group, 34 out of 100 females were correctly predicted for a 34% accuracy rate while 20 out of 38 female students were correctly predicted within the LOW GPA/RETAIN group for a 52.63% accuracy level. Similarly, 53.49% of the female students or 23 out of 43 were correctly predicted within the LOW GPA/DROP group.

In Table 17, the male students (N = 453) of the study population are presented with respect to the predicted versus actual group membership for the four mutually exclusive classification groups of HIGH GPA/RETAIN, HIGH
GPA/DROP, LOW GPA/RETAIN, and LOW GPA/DROP. An analysis of covariance within the groups revealed a significant chi-square statistic of 0.0001.

The one in four probability (25%) of correct placement was exceeded by all four groups. The HIGH GPA/RETAIN group showed a 92.39% accuracy rate with Table 16

**Female - Actual vs. Predicted Classification Group Membership**

<table>
<thead>
<tr>
<th>Predicted Group (Columns)</th>
<th>High GPA Retain</th>
<th>High GPA Drop</th>
<th>Low GPA Retain</th>
<th>Low GPA Drop</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actual Group (Rows)</strong></td>
<td><strong>N % Total (Row)</strong></td>
<td><strong>N % Total (Row)</strong></td>
<td><strong>N % Total (Row)</strong></td>
<td><strong>N % Total (Row)</strong></td>
<td><strong>N % Total (Row)</strong></td>
</tr>
<tr>
<td>High GPA Retain</td>
<td>400 94.12</td>
<td>14 3.29</td>
<td>5 1.18</td>
<td>6 1.41</td>
<td>425 100.00</td>
</tr>
<tr>
<td>High GPA Drop</td>
<td>61 61.00</td>
<td>34 34.00</td>
<td>0 0.00</td>
<td>5 5.00</td>
<td>100 100.00</td>
</tr>
<tr>
<td>Low GPA Retain</td>
<td>15 39.47</td>
<td>1 2.63</td>
<td>20 52.63</td>
<td>2 5.26</td>
<td>38 100.00</td>
</tr>
<tr>
<td>Low GPA Drop</td>
<td>18 41.86</td>
<td>1 2.33</td>
<td>1 2.33</td>
<td>23 53.49</td>
<td>43 100.00</td>
</tr>
<tr>
<td>Total</td>
<td>494 81.52</td>
<td>50 8.25</td>
<td>26 4.29</td>
<td>36 5.94</td>
<td>606 100.00</td>
</tr>
</tbody>
</table>

p = 0.0019

Chi-Square = 551.65, df = 459
Table 17

Male - Actual vs. Predicted Classification Group Membership

<table>
<thead>
<tr>
<th>Predicted Group (Columns)</th>
<th>Actual Group (Rows)</th>
<th>High GPA Retain</th>
<th>High GPA Drop</th>
<th>Low GPA Retain</th>
<th>Low GPA Drop</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High GPA Retain</td>
<td>267 92.39</td>
<td>9 3.11</td>
<td>5 1.73</td>
<td>8 2.77</td>
<td>289 100.00</td>
<td></td>
</tr>
<tr>
<td>High GPA Drop</td>
<td>28 44.44</td>
<td>30 47.62</td>
<td>1 1.59</td>
<td>4 6.35</td>
<td>63 100.00</td>
<td></td>
</tr>
<tr>
<td>Low GPA Retain</td>
<td>14 31.11</td>
<td>1 2.22</td>
<td>29 64.44</td>
<td>1 2.22</td>
<td>45 100.00</td>
<td></td>
</tr>
<tr>
<td>Low GPA Drop</td>
<td>22 39.29</td>
<td>2 3.57</td>
<td>3 5.36</td>
<td>29 51.79</td>
<td>56 100.00</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>331 73.07</td>
<td>42 9.27</td>
<td>38 8.39</td>
<td>42 9.27</td>
<td>453 100.00</td>
<td></td>
</tr>
</tbody>
</table>

\[ p = 0.0001 \]

Chi-Square = 590.79, df = 459

267 out of 289 male students correctly predicted within this group while 30 out of 63 males were correctly predicted within the HIGH GPA/DROP group for 47.62% accuracy. 64.44% or 29 out of 45 male students were correctly predicted.
within the LOW GPA/RETAIN group, and 29 out of 56 male students were correctly predicted within the LOW GPA/DROP group for a 51.79% accuracy rate.

Table 18

Overall Accuracy of Prediction for Classification Groups

<table>
<thead>
<tr>
<th>Predicted Group (Columns)</th>
<th>Actual Group (Rows)</th>
<th>High GPA</th>
<th>High GPA</th>
<th>Low GPA</th>
<th>Low GPA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td>N % Total (Row)</td>
<td></td>
</tr>
<tr>
<td>High GPA Retain 667</td>
<td>93.42</td>
<td>23</td>
<td>3.22</td>
<td>10</td>
<td>1.40</td>
<td>14</td>
</tr>
<tr>
<td>High GPA Drop 89</td>
<td>54.60</td>
<td>64</td>
<td>39.27</td>
<td>1</td>
<td>0.61</td>
<td>9</td>
</tr>
<tr>
<td>Low GPA Retain 29</td>
<td>34.94</td>
<td>2</td>
<td>2.41</td>
<td>49</td>
<td>59.04</td>
<td>3</td>
</tr>
<tr>
<td>Low GPA Drop 40</td>
<td>40.40</td>
<td>3</td>
<td>3.03</td>
<td>4</td>
<td>4.04</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td>825</td>
<td>92</td>
<td>8.69</td>
<td>64</td>
<td>6.04</td>
<td>78</td>
</tr>
</tbody>
</table>

The overall accuracies of prediction for the classification groups are presented in Table 18. Review of these data reveals an overall accuracy rate of
93.42% or 667 out of 714 students within the HIGH GPA/RETAIN group. The HIGH GPA/DROP group showed an accuracy rate of 39.27% with 64 out of 163 students correctly predicted in the group. Examination of these data also indicated an accuracy rate of 59.04% for the LOW GPA/RETAIN group with 49 out of 83 students correctly placed, and an accuracy rate of 52.53% was realized for the LOW GPA/DROP group which had 52 out of 99 students correctly placed within this group.

Summary

The responses of the entering freshmen for the fall 1990 semester at Texas Christian University to a set of variables contained within the Student Information Form combined with data from the Student Records System at Texas Christian University are reported in Chapter IV. In response to purpose one of the study, which was to classify the entering freshman class into four mutually exclusive groups: HIGH GPA/RETAIN, HIGH GPA/DROP, LOW GPA/RETAIN, and LOW GPA/DROP based upon an array of self-reported and actual variables, analysis of the data indicated that the HIGH GPA/RETAIN group (N = 714) contained the largest number of students followed by the HIGH GPA/DROP group (N = 163), the LOW GPA/DROP group (N = 99), and the LOW GPA/RETAIN group (N = 83) when the students were classified by actual grade point average and actual persistence indicators. Furthermore, analysis of these data indicated that there were differences in the size of the four mutually exclusive groups relative to gender. In general, females showed their highest
percentage of students in the HIGH GPA/DROP group with 61.35% and their lowest percentage of students in the LOW GPA/DROP group with 43.43%.

However, the classification of the males showed the opposite trend with their highest percentage in the LOW GPA/DROP group with 56.57% while the lowest percentage of their gender were classified into the HIGH GPA/DROP group with 38.65%. A comparison of group membership based upon actual grade point average and actual persistence indicators to the predicted group membership in the four mutually exclusive groups based upon only the self-reported variables indicated that the prediction of membership in the HIGH GPA/RETAIN group was the most accurate of all groups for both males and females with 94.12% and 92.39% accuracy levels respectively. The LOW GPA/DROP group was the second most accurately predicted group for females (53.49%) while the second most accurately predicted group for males was the LOW GPA/RETAIN group (64.44%). The HIGH GPA/DROP group exhibited the lowest accuracy of predicted membership with a 34% accuracy rate for females and a 47.62% accuracy rate for males. In general, a larger percentage of males were more accurately classified within three out of four of the mutually exclusive groups when compared to the females. The HIGH GPA/RETAIN group was the only group in which a larger percentage of females (94.12% accuracy rate) were more accurately classified than the males (92.39% accuracy rate).

In response to purpose two of the study, which was to compare the relationships among groups with respect to scholastics and persistence, analysis of
the data indicated significant correlations between scholastics and the variables consisting of: (a) average grade in high school, (b) academic ability, (c) father's educational level, (d) miles from home, (e) mother's educational level, (f) mathematical ability, and (g) drive to achieve. An examination of these data grouped by gender revealed variables significantly correlated with scholastics which were common to both genders and variables significantly correlated to scholastics which were unique to one particular gender. Both females and males shared the variables of: (a) average grade in high school, (b) academic ability, and (c) father's educational level as significant correlates with scholastics. Unique to the female gender were the variables of (a) physical health, (b) mother's educational level, and (c) self confidence (intellectual) which significantly correlated with scholastics. The variables of (a) miles from home, and (b) mathematical ability appeared as unique significant correlates with scholastics for the male gender.

Analysis of the data also indicated significant correlations between persistence and the variables of: (a) mother's educational level, (b) father's educational level, and (c) parent's gross income level. The variables of: (a) mother's educational level, and (b) father's educational level correlated significantly with persistence for the female gender. In addition to the mother's educational level appearing as a significant correlate to persistence, the male gender also included the variables of: (a) parent's gross income level,
(b) academic ability, and (c) average grade in high school as significant correlates to persistence. In general, the mother's educational level and father's educational level appeared as significant correlates in groups related to both scholastics and persistence.

Analysis of the data also indicated that the mother's educational level was the only significant discriminator for females between the retain and drop groups while the parent's gross income level and the average grade in high school were significant discriminators for males between the retain and drop groups. The average grade in high school was a significant discriminator between the high GPA and low GPA groups for both females and males. Miles from home was also a significant discriminator for males between the high GPA and low GPA groups while the father's educational level and physical health were significant discriminators for females between the same groups. The average grade in high school appeared as a significant discriminator for males in both the scholastics and persistence groups.

In response to purpose three of the study, which was to determine if there were significant differences between genders in the four groups with respect to the variables that classified them into their respective groups, an examination of the data revealed that females were significantly different from males within the HIGH GPA/RETAIN group with respect to: (a) competitiveness, (b) drive to achieve, (c) self-confidence (intellectual), and (d) popularity with the opposite sex. In addition, females within this group had a lower mean score on all four of the
variables in comparison to mean scores for males on the same variables. The HIGH GPA/DROP group showed significant differences between females and males with respect to: (a) competitiveness, (b) average grade in high school, and (c) self-confidence (intellectual). Males reflected higher mean scores on competitiveness and self-confidence (intellectual) while females exhibited a higher mean score on the average grade in high school. The variable of leadership ability appeared as the only significant discriminator between males and females within the LOW GPA/RETAIN group, and the mean score of the males was higher than that of the females for this variable. Within the LOW GPA/DROP group, the variables of: (a) physical health, and (b) self-confidence (intellectual) appeared as significant discriminator variables between genders with the male gender possessing the higher mean value on both of the variables. In general, the four classification groups did not share any single variable as a common significant discriminator between genders. Self-confidence (intellectual) was common to the three classification groups consisting of HIGH GPA/RETAIN, HIGH GPA/DROP, and LOW GPA/DROP. Competitiveness appeared as a significant discriminator between genders in the HIGH GPA/RETAIN and HIGH GPA/DROP classification groups. However, the HIGH GPA/RETAIN group contained two significant discriminator variables between males and females not found in the other groups. These variables consisted of: (a) drive to achieve, and (b) popularity with the opposite sex. Similarly, the HIGH GPA/DROP group showed the variable of average grade in high school to be a significant
discriminator between genders. However, this variable did not appear as a significant discriminator between genders in any of the other classification groups. The LOW GPA/RETAIN group showed the variable of leadership ability to be a significant discriminator between genders and unique only to that group. Finally, physical health appeared as a significant discriminator variable between females and males within the LOW GPA/DROP group, and this variable was unique as a significant discriminator for this particular group.
CHAPTER V

SUMMARY, DISCUSSION OF FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary

The purposes of this study were: (a) to classify the entering freshmen class into four mutually exclusive groups: HIGH GPA/RETAIN, HIGH GPA/DROP, LOW GPA/RETAIN, and LOW GPA/DROP based upon an array of self-reported and actual variables, (b) to compare the relationships among groups with respect to scholastics and persistence, and (c) to determine if there are significant differences between genders in the four groups with respect to the variables that classified them into their respective groups. In order to fulfill the purposes of the study, data were collected from the entering freshman class for the fall 1990 semester at Texas Christian University utilizing the Student Information Form (SIF) questionnaire developed by Alexander Astin in collaboration with experts in the areas of educational research, educational administration, policy making, and government. A composite subset of these data from the SIF, identified by previous research studies as related to and highly predictive of students’ scholastics and persistence, was combined with actual one-year scholastics and persistence indicators for the freshmen, thus creating a classification model (Appendix A) for the study.
The classification of students into the four mutually exclusive groups based upon actual scholastics and persistence indicators when compared to the predicted classification based exclusively upon the self-rating variables showed accurate predicted classifications for 667 students in the HIGH GPA/RETAIN group, 64 students in the HIGH GPA/DROP group, 49 students in the LOW GPA/RETAIN group, and 52 students in the LOW GPA/DROP group. This reflects a cumulative accuracy rate of 832 out of 1059 students or 78.56% predicted into the correct classification groups based exclusively upon the self-rating variables.

The same comparison of actual and predicted classifications for female students revealed that 400 were correctly predicted for the HIGH GPA/RETAIN group, 34 were correctly predicted for the HIGH GPA/DROP group, 20 were correctly predicted for the LOW GPA/RETAIN group, and 23 were correctly predicted for the LOW GPA/DROP group. Consequently, all four classification groups for the females generated a cumulative accuracy rate of 477 out of 606 students or 79.5%.

Similarly, considering only males, the HIGH GPA/RETAIN group showed that 267 males were correctly predicted in the group, while 30 males were correctly predicted in the HIGH GPA/DROP group. Additionally, the LOW GPA/RETAIN group for males reflected 29 students correctly predicted, and 29 males were correctly predicted in the LOW GPA/DROP group. This signifies a cumulative accurate prediction of 355 out of a total 453 males or 78.37%.
Generally, when all four classification groups were considered, females were accurately classified at a slightly better rate (79.5%) than males (78.37%). However, if the predicted classifications are compared within each individual classification group by gender, the males present a better accuracy of classification for the HIGH GPA/DROP group with 30 out of a total of 63 students or 47.62% correctly predicted as compared to the female rate of 34 out of 100 or 34% correctly predicted. The males also have a better accuracy of classification rate in the LOW GPA/RETAIN group when compared to the females. The accuracy of classification for the males in this group was 29 out of 45 for 64.44% while the accuracy of classification for females in this group was 20 out of 38 for 52.63%.

Females have a better accuracy of classification rate in the HIGH GPA/RETAIN group with 400 out of 425 for 94.12% as compared to males in the group which have an accuracy of classification rate of 267 out of 289 for 92.39%. Females also have a slightly better accuracy of classification rate in the LOW GPA/DROP group with 23 out of 43 or 53.40% when compared to the male accuracy rate of 29 out of 56 or 51.79%.

With respect to the relationships among the various groups examined in the study, the analysis of data indicated significant correlations associated with scholastics and persistence and specific variables within the classification model. For the study group (N = 1059), scholastics was significantly correlated with the classification model variables of (a) average grade in high school, (b) academic ability, (c) father's educational level, (d) miles from home, (e) mother's
educational level, (f) mathematical ability, and (g) drive to achieve. Mother's educational level and father's educational level were also significantly correlated with persistence for the study group.

Analysis of the data grouped by gender, with respect to scholastics and persistence, indicated that (a) average grade in high school, (b) academic ability, and (c) father's educational level were significantly correlated with scholastics, while the mother's educational level was significantly correlated with persistence for both females and males.

An analysis of the data to determine the differentiating (discriminating) power of the classification model variables with respect to scholastics and persistence showed that when the data were grouped by scholastics (high GPA and low GPA) for the female gender, (a) the average grade in high school, (b) father’s educational level, and (c) physical health appeared as significant discriminators between the groups.

An examination of the data related to these scholastics groupings for males revealed (a) average grade in high school, and (b) miles from home as significant discriminators between the groups. Similarly, when the data were grouped by persistence indicators (retain and drop) for the female gender, the mother’s educational level was the only significant discriminator between the groups. However, males showed (a) the parent’s gross income level, and (b) the average grade in high school as significant discriminators between the persistence groups of retain and drop.
Examination of the data within the four mutually exclusive classification groups revealed several significant differences between females and males with respect to the variables that classified them into the groups. Within the HIGH GPA/RETAIN group, females were significantly different from males with respect to their (a) competitiveness, (b) drive to achieve, (c) self-confidence (intellectual), and (d) popularity with the opposite sex. Females within this group consistently rated themselves lower on all of these variables in comparison to the males within the group. Within the HIGH GPA/DROP group, females were significantly different than males with respect to their self-ratings on (a) competitiveness, (b) average grade in high school, and (c) self-confidence (intellectual). Males in this group rated themselves higher than females on (a) competitiveness, and (b) self-confidence (intellectual) while females rated themselves higher than males on the average grade in high school.

Females differed significantly from males within the LOW GPA/RETAIN group on their rating of leadership ability with males exhibiting a higher mean rating on this variable. Examination of the data associated with the LOW GPA/DROP group indicated that females were significantly different than males with respect to their ratings on (a) physical health, and (b) self-confidence (intellectual). Males in this group rated themselves higher than females on both of the variables.
Discussion of Findings

The transition from high school into the college environment and the factors involved in the process have been the subject of much research over the past six decades. The research has often been conducted at a time when the student has already decided to leave the college environment, thus affording no opportunity for positive intervention in the decision process. Early identification of the entering freshmen who are at risk in the academic and social integration process is necessary in order to ensure that the needs of the students are addressed in a timely and targeted manner. Thus, problems associated with the transition from high school to college will be minimized and student retention will be impacted in a positive way.

The results of this study contribute information on a methodology for the early (prior to the classroom experience) classification of first-time, full-time college freshmen into mutually exclusive groups based upon scholastic and persistence potential. The results also contribute information on students grouped according to scholastic and persistence (actual and predicted). Commonalities and differences are examined among these groups with respect to the variables that classified the students into a particular group.

An analysis of the data was accomplished by using descriptive statistics based upon a Likert-type scale score associated with the self-reported variables which comprised the classification model (Appendix A). The .05 level was utilized to test for significance in all correlation and discriminant analysis.
The first purpose of the study was to classify the entering freshmen class into four mutually exclusive groups: (a) HIGH GPA/RETAIN, (b) HIGH GPA/DROP, (c) LOW GPA/RETAIN, and (d) LOW GPA/DROP based upon an array of self-reported and actual variables. Examination of the data in this manner allowed for a comparison of the group classifications based upon actual scholastic (GPA) and persistence (retain and drop) indicators to the predicted classifications based exclusively upon the self-rating variables used in the classification model. The findings associated with this classification process also relate to research question four which asks, "is the accuracy of classifying students into these groups on the basis of the variables statistically significant when compared to the classification based upon actual scholastic and persistence data?"

Based upon actual grade point average and persistence indicators for the study population (N = 1059), the data show that 714 students were classified into the HIGH GPA/RETAIN group, 163 students were classified into the HIGH GPA/DROP group, 83 students were classified into the LOW GPA/RETAIN group, and 99 students were classified into the LOW GPA/DROP group. The data indicated that a majority [163 (HIGH GPA/DROP)] of the non-persisting (drop) students [163 (HIGH GPA/DROP) + 99 (LOW GPA/DROP) = 262] were achieving satisfactory grades in coursework at the time of their departure from the university. Research studies conducted by Cope and Hannah (1975); Astin (1975); Pervin, Reik and Dalrymple (1966); Hossler and Bean (1990);
Brigman and Jacobs (1979); and Chase (1976) confirmed similar findings related to student departure from the university environment.

When the data were examined for the female gender they revealed that 400 females were correctly predicted into the HIGH GPA/RETAIN group based upon the self-rating variables. The actual size of this group based upon scholastic and persistence indicators was 425. This translated into a 94.12% accuracy of classification rate for the group.

The HIGH GPA/DROP group for females showed 34 students correctly predicted into the group based upon the self-rating variables while 100 students were classified into the group by actual scholastic and persistence indicators. This reflected an accuracy of classification rate of 34%. The LOW GPA/RETAIN group for females showed 20 students correctly predicted into the group based upon the self-rating variables while 38 students were classified into the group according to actual scholastic and persistence indicators, thus generating an accuracy of classification rate of 52.63% for the group. The fourth classification group for females, the LOW GPA/DROP group, showed that 23 students were correctly classified into the group based upon the self-rating variables while 43 students were classified into the group from actual scholastics and persistence data. This group realized a 53.49% accuracy of classification rate.

A summation of the accurate classifications for females based upon the self-rating variables for the four groups totals 477 students [400 (HIGH GPA/RETAIN) + 34 (HIGH GPA/DROP) + 20 (LOW GPA/RETAIN) + 23
(LOW GPA/DROP)] for a total female ($N = 606$) accuracy of classification rate of 78.71%. The probability of randomly placing a female into the correct group is 25% (one in four). All four classification groups exceeded this probability based upon the accuracy of classification rates.

An examination of the data for the male gender revealed that 267 students were correctly predicted into the HIGH GPA/RETAIN group based upon the self-reported variables while 289 students were classified into the group from actual scholastic and persistence indicators. The accuracy of classification rate for this group was 92.39%.

The HIGH GPA/DROP group for males showed 30 students correctly predicted into the group by the self-rating variables while a total of 63 males were classified into the group based upon actual scholastic and persistence indicators. This reflected an accuracy of classification rate of 47.62%.

For the LOW GPA/RETAIN group, a total of 29 males were correctly predicted from the self-rating variables, and the actual scholastic and persistence indicators placed 45 students into the group. This reflected an accuracy of classification rate of 64.44% for the group.

The fourth classification group, LOW GPA/DROP, showed that the self-rating variables correctly predicted 29 males into the group while the actual scholastic and persistence indicators classified 56 students into the group. This reflected an accuracy of classification rate of 51.79% for the group.
In comparison to the total group count of males ($N = 453$) classified by actual scholastic and persistence indicators, a summation of those males predicted into the correct classification groups by the self-rating variables generated a total of 355 students [267 (HIGH GPA/RETAIN) + 30 (HIGH GPA/DROP) + 29 (LOW GPA/RETAIN) + 29 (LOW GPA/DROP)]. This reflected a total male accuracy of classification rate of 78.37%. The probability of randomly placing a male into the correct group is 25% (one in four). All four classification groups exceeded this probability based upon the accuracy of classification rate.

A summation of the accuracy of classification numbers for the combined male and female population ($N = 1059$) revealed that 667 students were correctly predicted into the HIGH GPA/RETAIN group based upon the self-rating variables while 714 students were classified into the group based upon actual scholastic and persistence indicators. An accuracy of classification rate of 93.42% was realized by this group. The HIGH GPA/DROP group showed 64 students correctly predicted into the group by the self-rating variables while 163 students were classified into this group by actual scholastic and persistence indicators. This resulted in an accuracy of classification rate of 39.27% for the group.

A total of 49 students were correctly predicted into the LOW GPA/RETAIN group by the self-rating variables as compared to 83 students classified into the group based upon actual scholastic and persistence indicators. This reflected an accuracy of classification rate of 59.04% for the group.
The fourth classification group, the LOW GPA/DROP group, showed that 52 students were classified into the group based upon the self-rating variables while 99 students were classified into the group based upon the actual scholastic and persistence indicators. An accuracy of classification rate of 52.53% was calculated for this group. A summation of the accurate predictions based upon the self-rating variables for all four groups yielded a total of 832 students [667 (HIGH GPA/RETAIN) + 64 (HIGH GPA/DROP) + 49 (LOW GPA/RETAIN) + 52 (LOW GPA/DROP)]. This reflected an accuracy of classification rate of 78.56% for the combined female and male students.

An examination of the data for the study population (N = 1059), without consideration for gender, revealed that 664 students were correctly predicted into the HIGH GPA/RETAIN group based upon the self-rating variables. When compared to the 714 students classified into the group based upon actual scholastic and persistence indicators, this equates to an accuracy of classification rate of 93%.

The HIGH GPA/DROP group showed 39 students correctly predicted into the group based upon the self-rating variables. When compared to the 163 students classified into the group based upon actual scholastic and persistence indicators, this reflects an accuracy rate of 23.93% for the group. The third classification group, LOW GPA/RETAIN, showed 30 students correctly predicted into the group by the self-rating variables while 83 students were classified into
the group based upon actual scholastic and persistence indicators. This yielded an accuracy of classification rate of 36.14% for the group.

The fourth classification group, LOW GPA/DROP, showed 29 students accurately classified into the group based upon the self-rating variables and 99 students classified into the group based upon actual scholastic and persistence indicators. An accuracy of classification rate of 29.29% was calculated for this group.

A summation of the accurate predictions based upon the self-rating variables for all four groups yielded 762 students [664 (HIGH GPA/RETAIN) + 39 (HIGH GPA/DROP) + 30 (LOW GPA/RETAIN) + 29 (LOW GPA/DROP)]. When compared to the total study population (N = 1059), this reflected an overall accuracy of classification rate of 71.95%. Again, the probability of randomly placing a student into the correct group is 25% (one in four). Each classification group, with the exception of the HIGH GPA/DROP group, exceeded this probability based upon the accuracy of classification rates. The HIGH GPA/DROP group had an accuracy of classification rate of only 23.93%.

Based upon a comparison of the accuracy of group and total predicted classification rates achieved by the self-rating variables to the classification rates based upon actual scholastic and persistence indicators, the following trends were noted:
1. Of the four classification groups, the HIGH GPA/RETAIN group had the most accurate prediction rate for both males and females. The female rate was slightly higher at 94.12% compared to 92.39% for the males.

2. Of the four classification groups, the HIGH GPA/DROP group generated the least accurate prediction rate for both females and males. The male rate was higher at 47.62% when compared to the female rate of 34%.

3. Of the four classification groups, males in the LOW GPA/RETAIN group exhibited a relatively high accurate prediction rate of 64.44%.

4. The total female group (N = 606) showed a slightly higher accurate prediction rate of 78.71% when compared to the total male group (N = 453) rate of 78.37%.

5. For the combined female and male groups (N = 1059), the HIGH GPA/RETAIN classification group showed the highest prediction accuracy of all four groups with a rate of 93.42%. The LOW GPA/RETAIN group was second with a rate of 59.04% followed by the LOW GPA/DROP group's rate of 52.53% and the HIGH GPA/DROP group's rate of 39.27%.

6. The cumulative accuracy of predictions for females and males combined was 78.56%.

7. For the total study population (N = 1059), without consideration for gender, the prediction accuracy rates were consistently lower than the rates realized by either gender in three of the four classification groups. The HIGH GPA/RETAIN group showed the highest prediction rate with 93% followed by
the LOW GPA/RETAIN group with 29.29%, and the HIGH GPA/DROP
GROUP with a 23.93% prediction rate.

8. The overall accurate prediction rate, without consideration for gender,
was 71.95%. This reflects a drop of 6.61% in overall accuracy when compared to
the 78.56% accuracy rate realized when genders are considered individually.

In general, the data indicated that non-persisting (drop) students are not as
predictable as the persisting (retain) students. This finding is consistent with that
of Cope and Hannah (1975, p. 8) in research related to the complex nature of
factors associated with the withdrawal process.

The data also indicated that an examination by gender produced a
difference (increase) in the overall accuracy of prediction when compared to the
overall accuracy of prediction without regard for gender. Research studies by
Summerskill (1962); Cope and Hannah (1975); and Lenning, Beal and Sauer
(1980) note the importance of individual gender differences in the study of the
withdrawal process.

The second purpose of the study was to compare the relationships among
student groups with respect to scholastics and persistence. Research question one
asks, "which variables are significantly related to the freshmen students’ scholastic
ability and persistence?" Significant correlations between scholastic ability and the
variables that comprised the classification model were revealed when the data
were examined.
An analysis of the data for the study population showed that significant correlations exist between scholastic ability and (a) average grade in high school, (b) academic ability, (c) father's educational level, (d) miles from home, (e) mother's educational level, (f) mathematical ability, and (g) drive to achieve. When the data were examined by gender, significant correlations between scholastic ability and (a) average grade in high school, (b) academic ability, (c) father's educational level, (d) physical health, (e) mother's educational level, and (f) self-confidence (intellectual) were revealed for females.

For males, an examination of the data revealed significant correlations between scholastic ability and (a) miles from home, (b) average grade in high school, (c) academic ability, (d) father's educational level, and (e) mathematical ability.

In general, both females and males show significant correlations between scholastic ability and the classification model variables consisting of: (a) average grade in high school, (b) academic ability, and (c) father's educational level. Physical health and self-confidence (intellectual) are significantly correlated with scholastic ability for females only while drive to achieve is significantly correlated to scholastic ability for the total study population but not for individual genders.

The significant correlation between high school grades and scholastic ability (GPA) for this study population is consistent with research findings in studies conducted by Richards, Holland and Lutz (1967); Hoyt and Munday (1968); Astin (1975); Foster (1976); Benda (1991); and, Tan (1991).
Further examination of the data for the study population revealed the existence of significant correlations between persistence and the classification model variables consisting of: (a) mother’s educational level, (b) father’s educational level, and (c) parent’s gross income level. When the data were examined by gender, the variables consisting of: (a) mother’s educational level, and (b) father’s educational level were found to significantly correlate with persistence for females.

For males, the classification model variables of: (a) mother’s educational level, (b) parent’s gross income level, (c) academic ability, and (d) average grade in high school were found to significantly correlate with persistence.

In general, the mother’s educational level is significantly correlated with persistence for the total study population as well as for the individual genders. Academic ability and average grade in high school are significantly correlated to both scholastic ability and persistence for the males. Additionally, the father’s educational level is significantly correlated with scholastic ability for males, and the mother’s educational level is significantly correlated with persistence for males.

The research findings in studies by Winther (1969); Lenning, Beal and Sauer (1980); and, Hossler (1984) are confirmed by an examination of the data for this study which shows a significant relationship between high school grades and student persistence. In addition, the data for this study indicated a significant
relationship between the parent's educational levels and student persistence. This finding is consistent with research findings of Astin (1975), and Hossler (1984).

The ability of the classification model variables to differentiate or discriminate students with respect to scholastic ability and persistence was examined in response to research question two. Research question two asks, "do these variables significantly add to the differentiation of students with respect to scholastic ability and persistence?"

An examination of the data for the study population revealed that (a) average grade in high school, (b) father's educational level, and (c) miles from home are significant discriminators between the scholastic ability groups of high GPA and low GPA. Furthermore, the mother's educational level was found to be a significant discriminator between the persistence groups of retain and drop students.

Analysis of the data by gender indicated that the mother's educational level is a significant discriminator between the retain and drop groups for females while the parent's gross income level and the average grade in high school are significant discriminators between these groups for the males.

An examination of the data related to the scholastic ability groups, high GPA and low GPA, showed that the average grade in high school, the father's educational level, and physical health are significant discriminators for females between the groups while miles from home and average grade in high school are significant discriminators for the males between the groups.
In general, significant discriminators for students between persistence (retain and drop) and scholastic ability (high GPA and low GPA) groups can be summarized as follows:

1. Without consideration for gender, the average grade in high school, the father's educational level, and miles from home are significant discriminators between the scholastic ability groups of high GPA and low GPA. Mother's educational level is a significant discriminator between the persistence groups of retain and drop students.

2. For females, the mother's educational level is a significant discriminator between the persistence groups of retain and drop students.

3. For males, the parent's gross income level and the average grade in high school are significant discriminators between the persistence groups of retain and drop students.

4. For females, the average grade in high school, the father's educational level, and physical health are significant discriminators between the scholastic ability groups of high GPA and low GPA.

5. For males, miles from home, and average grade in high school are significant discriminators between the scholastic ability groups of high GPA and low GPA.

6. For females, both of the parent's educational levels are significant discriminators. The mother's educational level is a significant discriminator with
respect to persistence and the father's educational level is a significant
discriminator with respect to scholastic ability.

7. The average grade in high school is a significant discriminator for males
in persistence and scholastic ability.

The discriminating power of high school grades with respect to scholastic
ability for this study population parallels research findings in studies by Cole
(1969); Sedlacek (1972); Clewell and Joy (1988); and, Black (1969). While an
examination of data for this study revealed that the father's educational level is a
significant discriminator between scholastic ability (high GPA and low GPA)
groups, and the mother's educational level is a significant discriminator between
persistence (retain and drop) groups, a study by Astin (1975) showed that the
education levels of both parents were highly predictive of dropouts.

The data for this study also indicated that miles from home is a significant
discriminator between the scholastic ability (high GPA and low GPA) groups.
This information adds to the findings in research studies conducted by
Summerskill (1962); Lenning, Beal and Sauer (1980); and Hossler (1984) which
establish strong relationships between hometown location and residence
characteristics with respect to student persistence.

Differences between genders were identified in response to research
question three which asks, "is there a significant difference between genders with
respect to the differentiating variables?"
Analysis of the data indicated significant differences between females and males within the HIGH GPA/DROP group on: (a) competitiveness, (b) drive to achieve, (c) self-confidence (intellectual), and (d) popularity with the opposite sex. The variables consisting of: (a) competitiveness, (b) average grade in high school, and (c) self-confidence (intellectual) showed significant differences between genders in the HIGH GPA/DROP group. The variation of the responses between genders on leadership ability proved to be significant within the LOW GPA/RETAIN group. Additionally, the variation of the responses on physical health and self-confidence intellectual were significant between the genders within the LOW GPA/DROP group.

In general, females consistently rated below the males on all but one of the differentiating variables within all four of the classification groups. The single differentiating variable on which females rated higher than the males was the average grade in high school.

Conclusions

The problem of the study was to develop a methodology by which college freshmen are predicted into mutually exclusive groups based upon scholastics ability and persistence. The following conclusions are made based upon the findings of this study.

1. Accurate prediction of group membership for students with respect to scholastic ability and persistence is attainable.

2. Retained students are more predictable than students who drop out.
3. The educational levels of the parents as well as the average grade in high school assume a major role in the scholastic ability and persistence of the student.

4. Partitioning the students by gender increases the overall accuracy of prediction with respect to scholastic ability and persistence.

5. Females do not exhibit as much confidence in their academic and social abilities as do the males.

Implications For Retention

The early targeting and individualization of students at risk with respect to scholastics and persistence is the first step in the development of a successful retention program. This study provides information on a methodology for the accurate prediction of at risk students before they enter the classroom environment. This study is directed toward the identification of at risk students once they have been admitted to the university. The early identification of at risk students should enable the university to target and individualize retention programs and strategies in an effective manner. The study does not address the process by which students are granted admission to the university.

The educational background and financial support of the freshmen students' parents appears to be related to the academic achievement and persistence of the student. A link between the university and the parents of the at risk students might be beneficial in communicating the value of a university education in relationship to the costs.
Since the at risk students' decision to leave the university appears to vary with individual students, an extended orientation over the course of the freshman year might identify and resolve problems associated with student departure from the university. Students may be at risk in areas involving academic and social integration into the university. The unit or group responsible for the monitoring and retention of at risk students might have a greater positive impact within a department that has functional control of both the academic and student activities of the students.

**Recommendations For Further Research**

The timely identification and targeting of at risk students before they enter the classroom setting is only the initial process in the retention effort. This study does not provide information related to the retention-impacting changes that occur for students once they enter the college environment. The following recommendations are made for further research.

1. The predictability of scholastics and persistence should be examined as a function of time through longitudinal studies. Significant events over time may change the student's perceptions and self-ratings.

2. Further investigation should focus on the identification and isolation of additional factors related to the social integration process due to the relatively large numbers of academically-eligible students who do not return to the university for their second year.
3. An investigation of the interrelationships between commuters and students living on campus should be conducted in order to isolate commonalities and differences inherent in the groups.
APPENDIX

CLASSIFICATION MODEL VARIABLES
Listing of Classification

Model Variables

I. Academic background
   A. Average grade in high school- SIF item 7

II. Academic and social self-ratings with respect to peers- SIF item 25
   A. Academic ability
   B. Competitiveness
   C. Drive to achieve
   D. Emotional health
   E. Leadership ability
   F. Mathematical ability
   G. Physical health
   H. Popularity with the opposite sex
   I. Public speaking ability
   J. Self-confidence (intellectual)
   K. Self-confidence (social)
   L. Writing ability
III. Family background

A. Father's educational level - SIF item 27

B. Mother's educational level - SIF item 27

C. Miles from home - SIF item 6

D. Parent's gross income level - SIF item 26


