Predicting retention of adult university students
by Susan Marusiak Waldo

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University

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Results indicated that the variables, collectively or individually, did not account for a significant proportion of the variability in persistence. Goal commitment made the greatest contribution to accounting for the variance. Mean scores for persisters on all three variables were higher than mean scores for non-persisters.

When studying the retention of adult students, additional factors may be needed in Tinto's Model of Departure. An instrument is needed with adequate validity to measure this set of variables.

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Susan Marusiak Waldo

A thesis submitted in partial fulfillment
of the requirements for the degree

of

Doctor of Education

MONTANA STATE UNIVERSITY--BOZEMAN
Bozeman, Montana

December 1996

APPROVAL

of a thesis submitted by

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This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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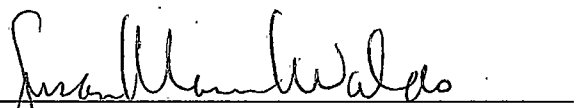
Signature 

Date 11/22/96

TABLE OF CONTENTS

	Page
LIST OF TABLES	vi
ABSTRACT	vii
1. INTRODUCTION	1
Purpose Statement	9
Need for the Study	10
Definition of Terms	11
Questions	13
2. REVIEW OF THE LITERATURE	14
Summary	22
3. METHOD	23
Conceptual Framework	23
Sample Description	24
Sampling Procedure	26
Hypotheses	27
Method of Data Collection	27
Instrument	28
Procedure	32
Method of Data Analysis	35
Limitations/Delimitations	37
4. RESULTS	38
Descriptive Statistics	38
Demographic Statistics	39
Descriptive Statistics for Responders	41
Summary of Descriptive Statistics	44
Multiple Regression	45
Null Hypotheses	46
Individual Contributions	47
Telephone Responders	51
Prediction of Persister/Non-persister Status	55

TABLE OF CONTENTS--Continued

	Page
5. CONCLUSIONS AND RECOMMENDATIONS	58
Summary of the Study	58
Conclusions	60
Recommendations	62
REFERENCES CITED	69

LIST OF TABLES

Table		Page
1.	Demographic Statistics for Responders	39
2.	Demographic Statistics for Non-responders . .	40
3.	Descriptive Statistics for Total Sample on Independent Variables	42
4.	Descriptive Statistics on the Academic Integration Variable	43
5.	Descriptive Statistics on the Social Integration Variable	43
6.	Descriptive Statistics on the Goal Commitment/Institutional Attachment Variable	44
7.	Pearson Correlations	45
8.	Analysis of Variance Summary Table	46
9.	Full Model: Dependent Variable is Persistence	47
10.	Pearson Correlations for Four Variables . . .	50
11.	Analysis of Variance for Four Variables . . .	50
12.	Full Model: Dependent Variable is Persistence	51
13.	Demographic Statistics of Telephone Responders	52
14.	Descriptive Statistics for Telephone Responders on the Independent Variable . . .	53
15.	Comparison of Group Means on the Independent Variables	54
16.	Estimated Ys and Predictions	56

ABSTRACT

The problem of this study was to predict retention of college students 25 years of age or older using Tinto's Model of Departure. The Model features the following set of variables: academic integration, social integration, and goal commitment/institutional attachment.

Data were collected to measure the variables using the Student Adaptation to College Questionnaire and analyzed using multiple regression.

Results indicated that the variables, collectively or individually, did not account for a significant proportion of the variability in persistence. Goal commitment made the greatest contribution to accounting for the variance. Mean scores for persisters on all three variables were higher than mean scores for non-persisters.

When studying the retention of adult students, additional factors may be needed in Tinto's Model of Departure. An instrument is needed with adequate validity to measure this set of variables.

CHAPTER 1

INTRODUCTION

American higher education has existed, evolved, and flourished since colonial times, adjusting to meet the needs and challenges of a democratic society (Garland, 1986; Monat, 1985). As the decades have passed, the issues have changed. Currently, higher education is "in the midst of a quiet revolution: the increasing number of nontraditional student" (Hore, 1992). The trend of increasing enrollment of adult students, defined as students over age 25, is interesting. When considering the decreasing numbers of high school graduates (Tinto, 1993) and the fact of dwindling financial resources (American Association of State Colleges and Universities, 1992), the growing population of adult students takes on new meaning. It becomes important for institutions of higher education to care about the continued enrollment or retention of adult students. This introduction will explore the current interest in retention, theories addressing the causes of students' withdrawal from college, and the new twist: adult students.

The retention of students is one of many issues in higher education that experiences varying degrees of interest. Ever in a state of transition and evolution

(Boyle, 1989), higher education is currently in a phase where retention is of high interest (Boyle, 1989; "Critical Issues in Higher Education," 1987; Garland, 1986; Nordquist, 1993; Van Allen, 1988). The current high level of interest in retention can be attributed to a number of reasons. Among them are the decline in the number of high school graduates (National Center for Education Statistics, 1993), concern over issues of equity, and economic concerns (Pappas, 1985; Tinto, 1992).

The total number of young adults enrolled in secondary school has steadily decreased from 1976 through 1993. These students constitute the traditional pool of students who may conceivably enroll in institutions of higher education, be that 2-year, 4-year, public, or private. The total high school enrollment in the year 1976 was 20,220,000; by the year 1991 that enrollment dropped to a low of 16,915,000 (National Center for Education Statistics, 1993). The high school enrollment figures are slowly climbing again, with projections for the year 2001 at 19,791,000--still lower than the 1976 figure (National Center for Education Statistics, 1993). The decrease in the traditional pool of applicants increases the competition among institutions of higher education to attract them. Slick brochures, promises of more for your money, and personalized attention are among the strategies in vogue as the numbers decrease and the competition for students increases. The focus has turned to

retention with the predicted numbers of high school graduates in the lower ranges and the rising cost of recruiting. It is logical to keep the students enrolled who have already been recruited. If the number of students who are retained is increased, enrollment figures can stay even or increase. With fewer high school graduates to attract, recruit and admit, retention of the current student population is of greater interest. Adults, as a student group, have quietly entered the undergraduate scene. Although adults constitute the fastest growing segment of American higher education (Fischer, 1991; Lehmann, 1992), they are not a target group for marketing by colleges and universities.

A second factor which has contributed to increased interest in retention of students is equity (Pappas, 1985; Tinto, 1992). Women and people of color have slowly but steadily wended their way into the higher education milieu. The numbers of women, Native American, Hispanic, African-American, and Asian students have been tallied and reported due to federal legislation requiring affirmative action, civil rights, and equal opportunity. Examining the numbers over the span of several decades, the increase is noticeable. In other times, the number of minority students enrolled has actually shown a decline (National Center for Education Statistics, 1993). In higher education, recruiting and admitting qualified students from under

represented populations plays a critical role in the pursuit of equity. Retaining these students is another role. Commitment to and promotion of equity in higher education mandates exploration of methods of retaining minority students. Questions about retaining minority students are in the early stages of exploration (Von Destinon, 1988). Adult students can be expected to appear in any or all of the minority designations. Women, in particular, are well represented in the adult student population. The National Center for Education Statistics (1992) estimated that 60% of the students over age 25 are women.

The financial factor has contributed to increased interest in student retention (Pappas, 1985; Tinto, 1992). Colleges and universities have faced and will continue to face fiscal problems. Costs of operating, new technology, and inflation add to the increased cost of educating students. At the same time, a decrease in state and federal financial support continues ("Critical Issues in Higher Education," 1987; Monat, 1985; Nordquist, 1993; Pembroke, 1985). The impact of an eroding financial picture is difficult to dispute (Chronicle of Higher Education, 1994). Fifty-four and a half percent of all faculty indicate economizing and cutting costs as a high priority at their institution. Forty-five percent of all administrators report across the board budget cuts at their institution over the past 5 years. Attrition (the opposite of

retention; loss of student enrollment) takes an economic toll on an institution (Metzner & Bean, 1987; Nordquist, 1993). Tuition and fees have become a significant percentage of the higher education budget, as states continue a pattern of decreased tax dollars committed to higher education (Nordquist, 1993). Because an important segment of the student population is adults, retention of adult students is of increasing concern.

Concern about promoting retention has led to development of a number of retention theories. These include the psychological theories of departure in the 1960s, societal theories, economic theories, organizational theories, and interactional theories (Tinto, 1992). The first fully developed theoretical model of retention was a societal theory presented by Spady in 1970 (Hassler & Bean, 1990). Spady believed that a student withdrawing from college was analogous to a person committing suicide--both withdraw from a social system. Spady (1970) suggested that the critical elements missing for the college student who withdraws from college are similar to those missing for a suicidal person: shared values and a support system. Students leave college because they do not experience shared values and support on campus.

Organizational theories suggest that retention is closely related to the university as an organization. Bean's 1980 work in student departure reflects the strongest

thinking of these organizational theories (Tinto, 1992). Based on industrial models of turnover, Bean presented a model of departure where students leave college because of the structures of the university. Departure is a reflection of the institution's behavior, as much as it is a reflection of the student's. The focus of Bean's theory is on bureaucratic structure, size, faculty-student ratio, resources, and goals of the university (Bean, 1983). Tinto (1992) asserts that the strength of organizational theory is its focus on the impact the university's structures and processes can have on students.

The current dominant theory of departure is an interactional theory first presented by Tinto in 1975 and amended in 1987. The constructs of Tinto's theory include the student's attributes (family background, high school grade point average (GPA), gender), academic and social integration, goal commitment, and institutional attachment. Tinto's theory is longitudinal. It considers the interaction between the student and the formal and informal organizations of the institution. While the students' attributes are important, their success at academic and social integration in the university is of greater importance to the retention or departure decision (Tinto, 1992). According to Boyle (1989, p. 290), "The model has withstood careful scrutiny from the profession and has

become accepted as the most useful for explaining the causes of student departure."

Theories of student departure have developed, expanded, and been refined over the decades with Tinto's interactional model being most accepted by the profession at this time. However, Tinto's theory has received limited use in attempting to understand the retention of adult students.

As retention moved from low to high and back again on the spectrum of research interest, a separate phenomenon was occurring in higher education: the "quiet revolution" (Hore, 1992) of increased numbers of adult students enrolling.

The changing demographics in the United States are a matter of record. The U.S. population will continue to grow older (Barr & Upcraft, 1990; Hore, 1992). There are simply more adults in our society than ever before (Merriam & Caffarella, 1991). The median age of the American population continues to rise--from 30.6 in 1982 to a projected 36.3 in the year 2000 (Cetron, Sorrano, & Gayle, 1985). Explanations for the increasing aging of American society include advancing age among the baby boomers and technological advances in medicine decreasing death by disease.

The change in demographics is reflected in higher education statistics. It is a fact: the fastest growing segment of American higher education is among the over 25 age group (Fischer, 1991; Lehmann, 1992). According to the

National Center for Education Statistics (1993), the number of older students has been growing more rapidly than the number of younger students. Between 1980 and 1990 the enrollment of students under the age of 25 increased by 3%, while the number of students over age 25 increased by 34%. This disparity is expected to continue. The percentage increase from 1990-1998 was expected to be 14% for persons over 25 and 6% for persons under 25 (National Center for Education Statistics, 1993). Adult students already constitute a majority on many campuses (National Center for Education Statistics, 1993; Puryear & McDaniels, 1990; Sandeen, 1991; Schwartz, 1993).

The two main reasons for the increasing numbers of adults enrolling in institutions of higher education are economics and numbers. Hore (1993, p. 1663) maintains one reason for the increase is "the recognition that education is as much a need for the old as it is for the young." This is echoed by Stephens (1992, p. 992) who proclaims that "for largely practical reasons, the age of lifelong education has arrived." The United States economy as well as the world economy is in the midst of change that affects types and numbers of jobs (American Association of State Colleges and Universities, 1992; Spanard, 1990). The types of jobs are changing with technology and the ever growing service industries. Necessary skills are different and new. Competition for jobs is keener and qualifications of

desirable workers are different (Pappas & Loring, 1985). People of all ages discover the need to turn to continued education (higher education) to hold their own in the job market.

A second factor in explaining the increasing enrollment of adults in higher education is the numbers. Worklife expectancy has increased while there are too many baby boomers for the current jobs (Schlossberg, Lynch, & Chickering, 1989). After examining the change in the economy of the nation, the job skills necessary, and the number of available workers, it is not surprising that many adults are reentering the world of education.

In summary, national data indicate that 30% of the freshmen who enrolled in Fall 1988 did not return in Fall 1989 (Chaney & Farris, 1991). This indicates that retention continues to be an issue nationally for higher education. The literature available and applicable to the study of retention indicates the value of Tinto's Model of Student Departure as well as the lack of research on adult student retention. Research on adult students is of concern as the numbers of adult students continues to increase. Research studies on retention of adult students is needed.

Purpose Statement

The purpose of this study was to predict retention of college students 25 years of age or older using Tinto's

Model of Departure which includes the following set of variables: academic integration, social integration, and goal commitment/institutional attachment.

Need for the Study

Retention has been and continues to be a critical issue for higher education ("Critical Issues in Higher Education," 1987). Most of the focus is on economics. State funding for institutions of higher education is driven by enrollment as tuition dollars contribute significantly to the total revenue picture. Many administrators feel that it is less expensive to retain a current student than to recruit a new one (Webb, 1987). Beyond revenue, persisting to graduation appears to be necessary in order for graduates to move into the job market, thus improving the economy. In addition, Trow (1988) identifies qualities of the mind (tolerance of cultural and class differences, a longer time perspective that helps sustain initiative and the ability to learn) that are by-products of a higher education and immensely important to the progress of society. Retention to graduation is important to the student, the institution's well-being, society's economy, and to the progress of society.

It is important to consider the retention of adult students because of their sheer numbers in higher education today. According to Kerka (1989), the presence of adult

students is no longer an emerging trend but a reality. Adult learners comprise at least 40% of the current undergraduate population (National Center for Education Statistics, 1989). Yet, very little of the research on student retention has been directed at adult students (Astin, 1993; Metzner & Bean, 1987). Information on the attendance patterns of 40% of the population could prove important. Ultimately, the retention of adult students may mean the survival of many institutions (Sandeen, 1991).

If factors contributing to the retention of adult students are known, the institution can use such information to create programs, develop interventions, and/or target particular groups or individuals for programs and interventions. Retention efforts could be built around identified factors. More students could persist.

Definition of Terms

For purposes of this study, terms were defined as follows:

1. Academic integration--a student's success in coping with the various educational demands characteristic of the college experience (Baker & Siryk, 1989). In this study, academic integration was operationalized as the score on the Academic Adjustment subscale of the Student Adaptation to College Questionnaire (SACQ).

2. Adult student--any person who is 25 years of age or older when enrolled in a credit academic program.
3. Attrition--voluntary withdrawal before completion of a semester or not registering for the next scheduled semester.
4. Goal commitment/institutional attachment--a student's degree of commitment to educational-institutional goals and degree of attachment to the particular institution the student is attending, especially the quality of the relationship or bond that is established between the student and the institution (Baker & Siryk, 1989). In this study, goal commitment was operationalized as the score on the Attachment subscale of the SACQ.
5. Non-persister--student not enrolled for both semesters of the 1995-1996 academic year or not registered for Fall 1996.
6. Persister--student enrolled for both semesters of the 1995-196 academic year and registered for Fall 1996.
7. Retention--completion of two semesters and registration for the following semester.
8. Social integration--a student's success in coping with the interpersonal-societal demands inherent in the college experience (Baker & Siryk, 1989). In this study, social integration was operationalized as the score on the Social Adjustment subscale of the SACQ.

9. Traditional age student--any student under age 25 when enrolled in an academic credit program.

Questions

The following questions were answered in this study:

1. Does the set of variables (academic integration, social integration, goal commitment/institutional attachment) account for a significant proportion of the variance in retention for adult students?
2. Which variable contributes most to the prediction of retention?
3. In which order do the other variables contribute?
4. Does academic integration make a significant unique contribution to predicting retention after the other variables have been taken into account?
5. Does social integration make a significant unique contribution to predicting retention after the other variables have been taken into account?
6. Does goal commitment/institutional attachment make a significant unique contribution to predicting retention after the other variables have been taken into account?

CHAPTER 2

REVIEW OF THE LITERATURE

A review of the literature on retention yields a solid overview of the area and provides a knowledge base for future research. For purposes of this study, the literature review focuses on three areas: a general overview of the retention topic, research specific to Tinto's Model of Student Departure, and research specific to the retention of adult students.

The bulk of the retention literature in the past 20 years is descriptive in nature. Most of the studies that are research-based use the theoretical framework of Vincent Tinto's Model of Student Departure (Boyle, 1989). Bean's Theory of Departure (1980) and Astin's Theory of Involvement (1985) account for the majority of the remaining literature on retention that is research-oriented. The three models or theories share some commonalities. They all assert that there is no single factor that ensures retention and that the population of students who withdraw is not homogeneous (Getzlaf, Sedlacek, Kearney, & Blackwell, 1984).

The involvement factor has different names but appears in each model. In Astin's Theory (1985), involvement in the academic and social aspects of the college community is the

single most important predictor of retention. Involvement includes activities such as living on campus, holding a job on campus, having formal and informal contact with faculty, and belonging to student organizations. In Bean's Model (1980), institutional fit is a result of involvement in the academic and social communities. In Tinto's Model (1975, 1987, 1993) academic integration is defined as academic performance and level of intellectual development. Social integration is defined as the extent and quality of peer-group interactions and faculty interactions (Tinto, 1975).

Support can be found throughout the literature for factors that fall into the realm of academic and social involvement/integration/fit. The broad term, involvement, is found to be a retention factor in studies whose populations include African-American students (Land & Land, 1991), Chicano students (Von Destinon, 1988), Native American students (Aitken & Falk, 1983), adult women students (Starks, 1987), adult students (Ashar & Skenes, 1993), and community college students (Price, 1993). Most studies on retention have focused on traditional age undergraduates (Astin, 1993; Darkenwald, 1981; Metzner & Bean, 1987) and confirm the importance of involvement for this group (Billson & Terry, 1987; Endo & Harpel, 1980; Friedlander & MacDougall, 1991; John, 1988; March, 1986; National Institute for Education, 1984; Pace, 1987; Upcraft, 1985; Zeller, 1987).

Contact with faculty is another common factor throughout the literature, regardless of the theoretical framework of the study. Formal and informal contact with faculty is cited as a positive factor in retention (Tinto, 1992). The common types of contact with faculty include individual exchanges in class, office visits, and social events. Studies conducted by Holm (1988), Terenzini and Pascarella (1980), and Von Destinon (1988) found a positive relationship between all contact with faculty and retention. Studies by Astin (1985) and Nordquist (1993) found contact with faculty--formal or informal--to have the greatest impact on satisfaction and retention. The impact of faculty on students is undeniable. The factors of involvement and contact with faculty consistently appear to be positively related to retention. This is regardless of the underlying theory.

Vincent Tinto's Model of Student Departure was first presented in 1975, updated in 1987, and modified slightly in the 1993 edition of Leaving College. Tinto's Model is the most often cited (Tinto, 1992) and most widely accepted (Boyle, 1989) departure model in the current literature. Pascarella, Terenzini, and colleagues have used Tinto's Model in eleven studies to date, beginning in 1977. The first three studies (Pascarella & Terenzini, 1977, Terenzini & Pascarella, 1977, 1978) were conducted at the same university and used the Adjective Rating Scale to measure

the variables and discriminant analysis or multiple regression to analyze the data. Total variance explained in these studies was 24.5% on average. Studies four, five and six (Pascarella & Terenzini, 1979a, 1979b, 1980) used special scales developed to measure the variables and discriminant analysis or multiple regression to analyze the data. Total variance explained in these studies was 30.9%, 47.6%, and 55.3% respectively. Pascarella and Terenzini (1980) concluded that Tinto's framework was conceptually sound. Their seventh study (Terenzini, Lorang, & Pascarella, 1981) replicated the earlier studies using a sample from a different university with similar results. Total variance explained was 44%. Four additional studies (Pascarella & Chapman, 1983; Pascarella & Terenzini, 1983; Pascarella, Duby, & Iverson, 1983; Terenzini, Pascarella, Theophilides, & Lorang, 1983) tested all of Tinto's major variables and found results consistent with the model. In each study, a similar questionnaire was used with modifications made depending on the population.

The study done by Pascarella and Chapman (1983) is of particular interest because it used a multi-institutional sample. The study included residential universities and four-year commuter institutions and upheld Tinto's Model, in general. Total variance explained was 28.2%. In addition, this study (Pascarella & Chapman, 1983) notes the absence of significant interaction between age and any of the

commitment or involvement variables. It suggests the Model would be applicable to adult students. Getzlaf et al. (1984) present further support for Tinto's Model as one for higher education in general, as opposed to individual institutions.

More recent studies based on Tinto's Model include some variations. Mallette and Cabrera (1991) studied a sample of traditional age freshmen at a large, residential university. Their results support the variables of Tinto's Model in explaining retention. In their study, they found more variance was explained when the distinction was made between students who withdraw voluntarily from college and those who transfer to another college. Nordquist (1993) further validates the Model in a qualitative study of 50 former students in the higher education system of the state of Utah. Nordquist's research found that contact with faculty (academic integration) had the greatest positive impact on the students' departure decision. His research also indicated extracurricular and peer interaction (social integration) was of little consequence. The students who withdrew reported feeling isolated or incongruent with the University's environment. Waggener (1993) used a benchmark approach in his study. Incoming freshmen supplied data that provided a measure of goal commitment, academic integration and social integration during orientation which occurred the summer before their first semester of enrollment. A second

set of data measuring goal commitment, academic integration, and social integration was collected at the end of the first semester of enrollment. Academic and social integration were found to be significant factors affecting continued enrollment. Also, goal commitment was found to be significant at both points in time--during orientation and at the end of the first semester.

In a 1992 study by Krotseng, an instrument entitled the Student Adaptation to College Questionnaire (SACQ) (Baker & Siryk, 1989) was used to predict retention with a sample of freshmen and transfer students at a private university. The SACQ closely parallels Tinto's Model of Departure and offers evidence of validity and reliability (Krotseng, 1992). Both identify the variables of academic and social integration as well as goal commitment and institutional attachment. In this study, the SACQ was used to predict student departure. Using discriminant analysis, the SACQ accurately predicted 85% of persisters and non-persisters (Krotseng, 1992).

Studies have explored Tinto's Model since the Model was first introduced in 1975. Those investigated through this review have validated the Model, some more than others. Pascarella and Chapman (1983) constructed a tool, the Student Involvement Questionnaire (SIQ), intended to measure the constructs as defined in Tinto's Model. Mallette and Cabrera (1991) added a financial variable to the Model. In a study of community college retention, Mutter (1992)

amended the SIQ to include questions on encouragement and support from loved ones and family, as suggested in Tinto's 1987 revision of the Model. Throughout the past two decades of research, Tinto's Model of Departure has proven to be basically solid with the original constructs intact.

Literature specific to the retention of adult students is scant. Bean and Metzner outlined a model for nontraditional student attrition (1985). It hypothesized that social integration would have little importance for adult student retention. The student attributes (family background, high school GPA, gender) and academic integration remain, while social integration was defined as external factors (job, family, finances) rather than factors within the college setting. As a result, in the Bean and Metzner Model, social integration would be provided by the students' family, community, and significant others. This model was tested in a subsequent study (Metzner & Bean, 1987) which sampled part-time students with a mean age of 23.8 years. The study confirmed the premise that social integration was not directly associated with retention. This outcome could be related to the part-time status of the students in the sample. Farabaugh-Dorkins (1991) applied the Bean/Metzner Model of Nontraditional Student Attrition to a sample of on-campus freshmen who were over 22 years of age and registered full-time. Results indicated that intent to leave (poor academic performance, low goal commitment)

was the best predictor of attrition, supporting Bean and Metzner's Model.

Starks (1987) studied adult women students enrolled in a community college. This study redefined Tinto's construct of social integration (peer-group and faculty interactions) as contact with fellow students and group studying. With the refined definition, retention was significantly correlated with academic integration and social integration. Holm's 1988 study of adult students in a degree program designed for adults found a variety of variables which positively affected retention. These included residence, previous post secondary education, 10 plus years of professional experience, interest in learning, and frequent contact with advisors. The finding that contact with advisors is related to retention confirms findings in other studies. This signifies the important relationship between student involvement with faculty and retention.

One recent study (Ashar & Skenes, 1993) applied Tinto's Model to nontraditional students. Their sample included 25 adult learner classes in a college of management and business. Results indicate a significant positive effect of social integration on retention, but not a similar effect for academic integration. This outcome may be attributed to the specific sample. The students in the sample were management majors who returned to school for work-related reasons (Ashar & Skenes, 1993).

Summary

Retention of students is an important issue in today's higher education. However, retention research has focused on the traditional student. Given the current and expected increase in adult students, it is time for retention research to consider the reasons for the departure of adult students. Research to date has indicated the complexity of the issue of retention. While not unanimous, some research points to the appropriateness of institution-specific models. Factors including academic and social integration, goal commitment, and institutional attachment consistently appear in the literature as related to retention.

CHAPTER 3

METHODS

The problem of this study was to predict the retention of adult students. The variables investigated include academic integration, social integration, and goal commitment/institutional attachment.

The study was conducted with students enrolled at Montana State University, Bozeman, Montana, in Fall 1995, Spring 1996, and Fall 1996.

The methodology for addressing this problem is presented as follows:

conceptual framework,

sample description,

hypotheses,

methods of data collection, and

methods of data analysis.

Conceptual Framework

This study was framed on the Theory of Departure formulated by Vincent Tinto and first published in 1975. This theoretical model states:

> The process of dropout from college can be viewed as a longitudinal process of interactions between the individual and the academic and social systems of the college during which a person's experiences

> in those systems of the college continually modify his goal and institutional commitments in ways which lead to persistence and/or to varying forms of dropout. (Tinto, 1975, p. 94)

According to Tinto, there are a number of factors contributing to a student's decision to continue enrollment in college (retention, persistence) or not to continue (attrition, departure). The factors are affected by experiences and may change over time. These factors include attributes, goals and commitments, academic and social integration.

Students bring a set of attributes with them (family background, high school GPA, gender, race) all of which are related to persistence. In addition, their experiences in both the academic and social arenas of the institution powerfully impact their commitment to goals and their institution. In Tinto's Model, this impact surpasses the influence of their attributes. Their commitment may be positively or negatively affected by academic and social experiences and will result in the decision to continue or to withdraw from school.

Sample Description

The sample in this study included those students, age 25 or older, enrolled at Montana State University for the first time in Fall 1995. This sample was further defined as those students registered for six or more credits.

Montana State University (MSU) is the land-grant institution in the state, established in 1893. It is a four year public, comprehensive, land grant University with undergraduate and graduate programs in liberal arts, basic sciences and the professional areas of agriculture, architecture, business, nursing, education, and engineering (Montana State University, 1994).

The student population at the time of the study was 55% men and 45% women; 75% were Montana residents. One hundred fifty were foreign students, with another 150 students coming from minority populations. One hundred of these students were Native Americans, the majority of which were Montana residents (B. Ashley, personal communication, November, 1995).

Three thousand undergraduates live on campus in a variety of housing situations. In addition to traditional residence halls, MSU offers 175 units of family housing and 400 rooms for older students in traditional residence hall buildings.

MSU is located in the city of Bozeman, MT, whose major industries are agriculture, tourism, and the University. With the Gallatin Valley's population of 30,000, 11,000 students are a noticeable addition. Bozeman attracts tourists with sites such as the Museum of the Rockies, Yellowstone National Park, and Big Sky, a destination ski and summer resort (Bozeman Area Chamber of Commerce, 1993).

Sampling Procedure

The Office of the Registrar provided a printout of students who met the following criteria: 25 years of age or older, registered for 6 or more credits, and their first semester enrolled at Montana State University was Fall 1995. The resulting list included 217 students. Given the small number in the population, the entire group was chosen to participate in the study. In essence, the population became the sample.

The sample included 109 male students, and 108 female students. Of the 217 total, 150 students identified themselves as white, 59 as Native Americans, 6 as Hispanic, and 2 as Asian-American. Fifty percent of the sample identified themselves as men and 49% as women. This ratio closely reflected the enrollment percentages for the University as a whole (55% men and 45% women). The percentage of the sample identifying themselves as non-majority (30%) was higher than the 7% of the total enrollment. One reason for this discrepancy was the influx of non-traditional age students in Fall 1995 from the Blackfeet Reservation as a result of a project managed by the Center for Bilingual and Multicultural Education and funded by grant dollars.

Hypotheses

The null hypotheses tested in order to answer the questions of this study were:

1. $R^2y,x_1,x_2,x_3,=0$. The linear combination of academic integration, social integration, goal commitment/ institutional attachment does not account for a significant proportion of the variance in retention.

2. $b_1=0$. Academic integration does not make a significant unique contribution to the variance in retention after other variables have been taken into account.

3. $b_2=0$. Social integration does not make a significant unique contribution to the variance in retention after other variables have been taken into account.

4. $b_3=0$. Goal commitment/institutional attachment does not make a significant unique contribution to the variance in retention after other variables have been taken into account.

Method of Data Collection

Data were collected through two sources: MSU Registrar's database (IA--Information Associates system) and the Student Adaptation to College Questionnaire (SACQ). The dependent variable, retention/attrition, was determined by information from the MSU Registrar. This information indicated the enrollment of each student in the sample

during the 1995-96 academic year and their registration status for Fall 1996. Students in the sample who completed both semesters and registered for Fall 1996 were considered persisters (retained). Those who were not enrolled after Fall 1995, after Spring 1996, or had not registered for Fall 1996 were considered non-persisters.

The printout from the Registrar also indicated the gender and race of each student, as well as the number of credits completed at the start of Fall 1995.

Instrument

The second source for collecting data was the Student Adaptation to College Questionnaire (SACQ), created and developed by Robert W. Baker and Bohdan Siryk (1989). The SACQ is a 67-item questionnaire divided into four principal subscales that focus on certain aspects of adjustment to college. The subscales are Academic Adjustment, Social Adjustment, Personal-Emotional Adjustment, and Goal Commitment/Institutional Attachment. Scores on the Academic Adjustment subscale, Social Adjustment subscale, and the Attachment subscale were used as the measures of the academic integration variable, social integration variable, and goal commitment/institutional attachment variable, respectively.

Each SACQ item is a statement that the student responds to on a 9-point scale. The scale ranges from "applies very

closely to me" to "doesn't apply to me at all." As explained in the SACQ Manual,

> For scoring purposes, values from 1 to 9 have been assigned to successive positions in a continuum that ranges from less adaptive to more adaptive adjustment, respectively. For 34 of the items (the negatively keyed items), these values run from 1 to 9, while for the other 33 items (positively keyed items) the values run from 9 to 1. (Baker & Siryk, 1989, p. 34)

The questionnaire is presented on two 8 1/2" x 11" pages with scoring grid and carbon paper between for scoring by hand. Completing the questionnaire takes about 20 minutes.

The Academic Adjustment subscale includes 24 items such as "I have been keeping up to date on my academic work" and "Recently I have had trouble concentrating when I try to study." It includes four-item clusters: motivation, application, performance, and academic environment.

The Social Adjustment subscale includes 20 items such as "I feel that I fit in well as part of the college environment" and "Lonesomeness for home is a source of difficulty for me now." Its four-item clusters are general (extent and success of social activities), other people, nostalgia, and social environment.

The Goal Commitment/Institutional Attachment subscale includes 15 items such as "I expect to stay at college for a bachelor's degree" and "On balance, I would rather be home than here." It has two-item clusters: general (feelings about being in college in general) and this college (feelings about the particular institution).

The SACQ was first used in 1980 and has subsequently been used in a variety of settings that range from small, private colleges to large, land-grant universities. Reliability is reported with Cronbach's alpha. Coefficients are Academic Adjustment subscale (range is .81 to .90), Social Adjustment subscale (range is .83 to .91), and Attachment subscale (range is .85 to .91). According to the SACQ Manual (Baker & Siryk, 1989, p. 34), internal consistency is used rather than test-retest because the variables measured are not necessarily stable. However, these can be expected to vary with environmental changes or events.

Baker and Siryk (1989) contend the SACQ has been sufficiently validated across institutions and years (34 administrations of current version between 1980-1989). Intercorrelations among subscales range from .40 to .60 (Baker & Siryk, 1989, pp. 34-41). Baker and Siryk (1989) conclude that the correlations are large enough to indicate that the scales measure a common construct "but small enough to support the conceptualization of that construct as having different facets as represented by the subscales" (Baker & Siryk, 1989, p. 34). Evidence of the validity of the SACQ includes criterion related validity for all subscales.

To establish criterion related validity for the Academic Adjustment subscale, the two criteria used were

freshman year grade point average (r=.35) and election to an academic honor society in the junior or senior year (r=.14).

Two criteria were used to establish criterion related validity for the Social Adjustment subscale. The first was a social activities checklist which showed a correlation of r=.47 to the Social Adjustment subscale. The second compared the Social Adjustment subscale scores to the application for dormitory assistant positions. No r was reported for this comparison. The authors contend that the validity of the scale was supported by confirmation of the expectation that the means of the social adjustment subscale would be highest for the hired students, next highest for those who were interviewed but not hired, and lowest for those rejected.

The criterion used to establish criterion related validity for the Goal Commitment/Institutional Attachment subscale was attrition after one year (r=-.43). When using attrition as the criterion, correlation for the other subscales were as follows: Academic Adjustment subscale r=-.13 and Social Adjustment subscale r=-.18. In overview, Baker and Siryk (1989, p. 49) conclude that "the subscales relate to a statistically significant degree in expected directions to independent real-life behaviors that may be regarded as especially relevant to particular subscales."

A study by Krotseng (1992) supports the use of the SACQ to measure the variables of Tinto's Theory of Departure.

According to Krotseng (1992), the SACQ closely parallels Tinto's Theory. In particular, the SACQ variables of academic and social adjustment are very similar to Tinto's constructs of intellectual and social integration. Both the SACQ and Tinto's Theory are based on self-report data. In other words, they measure "what one thinks is real" (Tinto, 1987, p. 127). Krotseng (1992, p. 103) concluded the SACQ should be able to predict retention.

Procedure

A cover letter stressing the importance of their response (Gay, 1992) and the SACQ were mailed to all students in the population during the week of October 15, 1995 (mid-term). The cover letter was printed on Division of Student Affairs letterhead, with a stamped, addressed envelope (Division of Student Affairs imprinted) enclosed.

All SACQs and envelopes were numbered with a random number assigned to the student and were noted on a master sheet as responses were received. Seventy-eight surveys were returned.

During the week of November 20, 1995, postcards were sent to nonresponders, again stressing the importance and value of their responses. An additional 12 surveys were returned.

A total of 90 surveys were returned. Eighty-nine were usable, for a response rate of 41%. Thirty-seven of the 109

men responded for a 33% response rate; 52 of the 108 women responded for a 48% response rate. Of the 67 non-white students in the population, 27 responded for a response rate of 40%. Response rate was 51% for Caucasians.

Of the 89 usable surveys, it was found that a high number of the students had completed more than 30 credits at the start of the Fall semester. Sixty of the respondents had completed more than 30 credits. Twenty-nine of the respondents had completed less than 30 credits (freshman level).

Given the low response rate (89 of 217 for 41%), the SACQ was administered to an additional 20 students over the telephone during the week of October 21, 1996. The telephone interviews were conducted approximately one year after the initial questionnaire was mailed. Responders were asked to answer as they remembered their situation in October of 1995.

The telephone sample was drawn from the list of non-responders. A list of randomized numbers from 1 through 128 was generated by the MSU Stat computer program. Those nonresponders matching the first 50 random numbers became the telephone pool. Twenty students were eliminated as their telephone numbers were not valid (disconnected, moved, or not known). The first 20 students contacted became the telephone responder group. No one refused to complete the Questionnaire when contacted.

Most students did not recall receiving the SACQ in the mail in October of 1995. The few (3) who did recall receiving the Questionnaire offered various reasons for not returning it. One said that the Questionnaire was too long. The second student said that he received repeated requests to complete surveys and so did none. The third student, who recalled receiving the SACQ in the mail in October of 1995, said he did not return it because he did not know the sender.

The 20 telephone calls lasted an average of 15 minutes each. Actual administration of the Questionnaire required about 10 minutes. With each call, a brief discussion ensued about particular issues or strong points for that student.

The telephone responders included 10 men and 10 women. Of the 20 total telephone responders, 9 were Caucasian (45%) and 11 were Native American (55%).

In summary, students in the sample received a mailing during the week of October 15, 1995. Its return provided data from the SACQ, which were used to measure the 3 independent variables. A second group of responders was elicited as the initial group included a total of 41% of the possible responders. Twenty additional responders were administered the SACQ over the telephone in October, 1996. Additional data about enrollment on the entire sample were supplied by the MSU Registrar and used to determine whether

each student was a persister or non-persister, the dependent variable.

Method of Data Analysis

The data collected from students through the Registrar and the SACQ were analyzed using multiple regression. Multiple regression is appropriate for use when the dependent variable represents group membership and the analysis includes more than two independent variables (Kerlinger & Pedhazur, 1973). It is possible to analyze the amount of variation in each independent variable which is associated with the dependent variable (Kerlinger & Pedhazur, 1973). Multiple regression indicates the comparable strength of each independent variable's contribution as well as the collinearity among variables. It was used to test all null hypotheses.

The level of significance (alpha) was set at .05. This provided reasonable protection against both a Type I and Type II error (Gay, 1992).

Variables were entered as follows:

Y Non-persisters--0

Persisters--1

x_1 Academic integration--score on the SACQ Academic Adjustment subscale. Range = 24-216 (higher score indicating better adjustment).

x_2 Social integration--score on the SACQ Social Adjustment subscale. Range = 20-180 (higher score indicating better adjustment).

x_3 Goal commitment/institutional attachment--score on the SACQ Attachment subscale. Range = 15-135 (higher score indicating stronger commitment/attachment).

Null Hypothesis 1 (the linear combination of independent variables does not account for a significant proportion of the variance in the dependent variable) was accepted or rejected on the basis of the F of the full model. The R^2 indicated the proportion of variance in retention accounted for by the independent variables.

Null Hypotheses 2 through 4 (each independent variable does not make a significant unique contribution to the variance in retention after the other variables have been taken into account) were accepted or rejected based on their R^2 in the full model.

An additional procedure was used to determine the accuracy of status prediction for each student (persister-non-persister). The prediction was made using the independent variables (academic integration, social integration, attachment) and the regression equation generated by the multiple regression. An estimated Y (Y^) was calculated for each responder. In this study, Y was the dependent variable, entered as 0 for a student who did not persist or entered as 1 for a student who did persist. If a

responder's Y^ was calculated to be less than .5, that student was predicted to be a non-persister. If a responder's Y^ was calculated to be .5 or higher, that student was predicted to be a persister. The predicted status of each responder was compared to the actual status of each responder to determine the accuracy of the predictions. The percentage of correct matches was computed. The ability to predict which students are likely to withdraw would be useful in planning and targeting retention interventions.

Limitations/Delimitations

1. The population for the study was limited to those students enrolled at Montana State University--Bozeman during Fall 1995.

2. The number of students in the population was low.

3. A high number of respondents (60) had more than 30 credits accumulated.

4. The response rate was low (89 of 217).

CHAPTER 4

RESULTS

The purpose of this study was to predict the retention of adult students through the following variables: academic integration, social integration, and goal/institutional attachment. MSU Stat was used to calculate the multiple regression. Collected data are presented as follows:

1. descriptive statistics,
2. multiple regression, and
3. prediction of persister/non-persister status.

Descriptive Statistics

Descriptive statistics provide information on the students in the sample, both responders and nonresponders. This information includes breakdowns on the characteristics of gender, race, credits earned, and grade point average. Scores on the subscales (the independent variables) are presented for responders. Demographic statistics are presented in Table 1 for the responders and Table 2 for the non-responders.

Demographic Statistics

Table 1 presents the demographic statistics for all responders. Groups identified include gender, race, credits completed, and grade point average.

Table 1. Demographic Statistics for Responders.

Category	Total n		Non-persisters		Persisters	
Total	89	(100%)	22	(25%)	67	(75%)
Male	37	(42%)	11	(30%)	26	(70%)
Female	52	(58%)	11	(21%)	41	(79%)
Caucasian	62	(70%)	14	(23%)	48	(77%)
Non-white	27	(30%)	8	(30%)	19	(70%)
30+ credits	60	(67%)	12	(20%)	48	(80%)
<30 credits	29	(33%)	10	(34%)	19	(66%)
2.0+ GPA	78	(88%)	17	(22%)	61	(78%)
<2.0 GPA	11	(12%)	5	(45%)	6	(55%)

Table 1 affords an overview of the responders and their characteristics. Considering the national rate of 70% persisters (Higher Education Surveys, 1991), the same might be expected for this sample. From Table 1, the approximate 70% persister rate holds for most categories. Men, women, students of all races, students with less than 30 credits, and students with a GPA above 2.0 persisted at about the 70% rate. Students with more than 30 credits persisted at a rate higher than the national average (80%). Students with a GPA of less than a 2.0 have the smallest gap between persisters (54%) and non-persisters (45%). Of the 22 non-persisters, 17 had a GPA of 2.0 or above.

Table 2 presents the demographic statistics for the non-responder group, including gender, race, credits completed and grade point average. The status of each non-responder (persister/non-persister) is also indicated.

Table 2. Demographic Statistics for Non-responders.

Category	Total n		Non-persisters		Persisters	
Total	128	(100%)	57	(45%)	71	(55%)
Male	72	(56%)	30	(42%)	42	(58%)
Female	56	(44%)	27	(48%)	29	(52%)
Caucasian	88	(69%)	37	(42%)	51	(58%)
Non-white	40	(31%)	20	(50%)	20	(50%)
30+ credits	91	(71%)	41	(45%)	50	(55%)
<30 credits	37	(29%)	16	(43%)	21	(57%)
2.0+ GPA	106	(83%)	38	(36%)	68	(64%)
<2.0 GPA	22	(17%)	19	(86%)	3	(14%)

The total number of non-responders was 128. The percentages for gender (male-56%, female-44%) match the percentages for the total enrollment. The gender percentages for responders were male-42%, female-58%. The number of male non-responders was 72 and the number of male responders was 37. For females, the number of non-responders (56) was closer to the number of female responders (52). For the non-responders, the breakdown by race was caucasian-69%, non-white-31%. Seventy percent of the responders were caucasian and 30% were non-white. This relates to the total enrollment percentages of 93% caucasian, 7% non-white. Fifty-seven of the non-responders were non-persisters (45%), compared to 25% non-persister

rate for responders and the 30% average nationally. Seventy-one of the non-responders were persisters (55%) compared to the 75% persister rate for responders and 70% rate for persisters nationally.

As with responders, 71% of non-responders brought more than 30 credits into their first semester at MSU, with 29% of the non-responders having accumulated less than 30 credits. The percentage of non-responders having above a 2.0 GPA was 83% (88% for responders). The percentage of non-responders having a GPA below 2.0 was 17% (12% for responders).

With one exception, the 89 responders and 128 non-responders are very similar. The exception is the percentage split for each group of persisters/non-persisters. The percent of responders who were non-persisters was 25%. For non-responders, the percent who were non-persisters was 45%. Seventy-five percent of responders were persisters; for non-responders, the percent of persisters was 55%. In short, more of the responders were also persisters.

Descriptive Statistics for Responders

Descriptive statistics are presented for responders. The tables offer an overview of total group scores and demographic group breakdowns on scores for the three independent variables. Table 3 presents the descriptive

statistics for all responders on the independent variables; Table 4 exhibits the descriptive statistics for all demographic groups on the academic integration variable. The descriptive statistics for all demographic groups on the social integration variable are presented in Table 5. The descriptive statistics for all demographic groups on the attachment variable are presented in Table 6.

Table 3 presents an overview of the scores of all responders on the three independent variables.

Table 3. Descriptive Statistics for Total Sample on Independent Variables.

Variable	Possible range of scores	Minimum	Maximum	Mean	Standard Deviation
Academic adjustment	24-216	87	212	160.20	28.37
Social adjustment	20-180	28	172	119.30	27.82
Attachment	15-135	15	133	107.17	18.72

The possible range of scores is indicated, as well as the minimum score recorded, the maximum score recorded, the mean score and the standard deviation for each independent variable. Comparing these means to the tables of the SACQ manual, all three are within the average range of normed responses.

Table 4 presents descriptive statistics for the demographic groups of responders on the academic integration variable.

Table 4. Descriptive Statistics on the Academic Integration Variable.

Category	n	Maximum	Minimum	Mean	Standard Deviation
Persister	67	102	212	162.5	26.01
Non-persister	22	87	202	153.1	34.31
Male	37	102	212	155.6	27.34
Female	52	87	212	163.5	28.81
Caucasian	62	87	212	159.3	29.11
Non-white	27	122	212	162.2	27.03
30+ credits	60	88	212	159.6	27.72
<30 credits	29	87	212	161.5	30.14

The mean differences for all categories on academic integration are 10 or less points. The standard deviations range from about 25 to 34.

Table 5 presents descriptive statistics for the demographic groups of responders on the social integration variable.

Table 5. Descriptive Statistics on the Social Integration Variable.

Category	n	Maximum	Minimum	Mean	Standard Deviation
Persister	67	28	172	120.8	28.87
Non-persister	22	46	167	114.7	24.36
Male	37	59	167	119.2	26.77
Female	52	28	172	119.3	28.80
Caucasian	62	28	172	115.8	30.07
Non-white	27	110	167	127.4	20.01
30+ credits	60	28	172	113.6	29.19
<30 credits	29	88	167	131.4	20.35

The total sample, men, and women have the same mean score on the social integration variable. For other groups, the mean differences are 10 or less points. Standard deviations, as with academic integration fall in the 20-30 range.

Table 6 presents descriptive statistics for all demographic groups of responders on the goal commitment/ institutional attachment variable.

Table 6. Descriptive Statistics on the Goal Commitment/ Institutional Attachment Variable.

Category	n	Maximum	Minimum	Mean	Standard Deviation
Persister	67	15	133	109.0	19.57
Non-persister	22	66	130	101.7	14.99
Male	37	73	130	106.4	13.45
Female	52	15	133	107.7	21.83
Caucasian	62	15	133	106.3	20.71
Non-white	27	92	130	109.2	13.21
30+ credits	60	15	133	105.2	18.80
<30 credits	29	66	133	111.4	18.18

Means on the attachment variable range from about 101 to 117, with the non-persisters showing the lowest mean. The standard deviations are somewhat smaller ranging from 12 to 21.

Summary of Descriptive Statistics

The demographic and descriptive statistics indicate little variation in persistence/non-persistence when

considering either the various categories (gender, race, credits completed) or the three independent variable mean scores (academic integration, social integration, and attachment). Baker and Siryk (1989) contend that persisters will have higher scores on the subscales in general. For this sample, the mean score differences for both persisters and non-persisters could be described as minimal. Persisters did have higher mean scores on the three subscales, but the differences were less than one standard deviation.

Multiple Regression

The multiple regression results were used to test the null hypotheses. Pearson Correlations are presented first. The null hypotheses, relevant tables, and findings for each follow.

The Pearson Correlations offer a sense of the relative strength of relationships between the variables.

Table 7. Pearson Correlations.

		Y	AI	SI	A
Persistence	Y	1.0000	.1437	.0981	.1678
Academic Integration	AI	.1437	1.0000	.5125	.6302
Social Integration	SI	.0981	.5125	1.0000	.7986
Goal Commitment	A	.1678	.6302	.7986	1.0000

As illustrated in Table 7, the Pearson Correlations for all responders suggest that the independent variables are highly related to one another and have a great deal of variance in common. There is no indication of a strong relationship between the dependent variable (persistence) and any of the independent variables.

Null Hypotheses

The first step in the regression analysis was to determine if there was a significant R-square between the independent variables (academic integration, social integration, attachment) and the dependent variable (persistence). The regression analysis indicated there was a non-significant R-Square between the dependent variable and each of the independent variables. The results are presented in the Table 8.

Table 8. Analysis of Variance Summary Table.

Source	DF	S.S.	M.S.	F-value	P-value
Regression	3	.56668	.18889	1.00	.3953
Residual	85	15.995	.18818		
Total	88	16.652			

R^2 = .0342

Ho 1--The linear combination of academic integration, social integration, goal commitment/institutional attachment

does not account for a significant proportion of the variability in retention.

Test--The R^2 for the full model is .034, indicating that 3.4% of the variance in the model is explained by these variables. The F of 1.00 is not significant as determined by the p-value of 0.395 which exceeds the alpha of .05.

Decision--Ho 1 is retained. The F value was not significant. The combination of the independent variables explained 3.4% of the variability in retention which is not significantly different from zero.

Individual Contributions

The next step in the regression analysis was to determine if any single independent variable (academic integration, social integration, attachment) made a significant, unique contribution to accounting for the variability in persistence. The relative strength of the contribution of each independent variable is illustrated in the multiple regression analysis of the full model. Significance was determined by the b weight and p-value for each variable. Table 9 presents this information.

Table 9. Full Model: Dependent Variable is Persistence.

Variable	R-Part	Std-B	B	SE(B)	T	P-value
Academic Integration	.0509	.0645	.000985	.002099	.47	.640
Social Integration	-.0616	-.1008	-.001571	.002763	-.57	.571
Goal Commitment	.1142	.2076	.004810	.004539	1.06	.292

Ho 2--Academic integration does not make a significant unique contribution to accounting for the variance in retention after other variables have been taken into account.

Test--The b weight for academic integration in the Full Model is .00985 with a p-value of 0.6400. Academic integration explains less than 1% of the variability when taken in combination with social integration and attachment. A p-value of 0.64 exceeds the alpha of .05.

Decision--Ho 2 is retained. A variable that is not significant in the Full Model will not be significant when the R^2 of its individual contribution is determined.

Ho 3--Social integration does not make a significant unique contribution to accounting for the variance in retention after other variables have been taken into account.

Test--The b weight of social integration in the Full Model is -.0157 and the p-value is 0.57. Social integration explains less than 1% of the variability in retention when taken in combination with academic integration and goal commitment. The p-value of 0.57 exceeds the alpha of .05.

Decision--Ho 3 is retained. A variable that is not significant in the Full Model will not be significant when the R^2 of its individual contribution is determined.

Ho 4--Goal commitment/institutional attachment does not make a significant unique contribution to accounting for the variance in retention after the other variables have been taken into account.

Test--The b weight of attachment in the Full Model is .048 and the p-value is 0.29. Attachment accounts for 1% of the variability when taken in combination with academic integration and social integration. The p-value of .29 exceeds the alpha of .05.

Decision--Ho 4 is retained. A variable that is not significant in the Full Model will not be significant when the R^2 of its individual contribution is determined.

All of the nulls are retained. Neither the combination of academic integration, social integration, and attachment nor the individual contributions of the same accounts for a significant proportion of the variance in retention.

The second regression was run because of the high number of students in the sample (60) with more than 30 credits accumulated at the beginning of Fall 1995. A multiple regression was calculated in which the full model included the three variables plus the variable of more than 30 credits or less than 30 credits. Pearson Correlations and multiple regression results for this model are presented in Table 10 and Table 11.

Table 10. Pearson Correlations for Four Variables.

		Y	AI	SI	A	C
Persistence	Y	1.0000	.1435	.0980	.1678	.1574
Academic Integration	AI	.1435	1.0000	.5124	.6301	-.0324
Social Integration	SI	.0980	.5124	1.0000	.7986	-.3016
Goal Commitment	A	.1678	.6301	.7986	1.0000	-.1568
Credits	C	.1574	-.0324	-.3016	-.1568	1.0000

The Pearson Correlations indicate little relationship between the variable of credits and the variables of academic integration, social integration, and goal commitment. The relationship of credits to the dependent variable of persistence is similar to the relationship of academic integration and goal commitment to the dependent variable of persistence.

The analysis of variance table for this model follows.

Table 11. Analysis of Variance for Four Variables.

Source	DF	S.S.	M.S.	F-value	P-value
Regression	4	1.0573	.26433	1.43	.2305
Residual	84	15.504	.18458		
Total	88	16.562			

R^2 = .0638

As indicated in Table 11, the proportion of variance explained by the independent variables is 6%. It is not significant from zero even with the addition of the credits variable.

Table 12 illustrates the contribution of each independent variable to accounting for the variance.

Table 12. Full Model: Dependent Variable is Persistence.

Variable	R-Part	Std-B	B	SE(B)	T	P-value
Academic Integration	.0340	.0426	.000652	.00208	.31	.755
Social Integration	-.0065	-.0109	-.000169	.00286	.06	.952
Goal Commitment	.0994	.1784	.004132	.00451	.92	.362
Credits	.1752	.1834	.16882	.1035	1.63	.106

As shown in Table 12, the R-part for the variable of credits indicates it accounts for 3% of the variance in persistence when taken in combination with academic integration, social integration, and goal commitment. The b weight of .168 is not significant as indicated by the p-value of .106 which is greater than .05.

Telephone Responders

An additional 20 responders were elicited by telephone in October of 1996. These were compared to the group of 89 initial responders. Due to the low response rate (41%) additional responders were sought to ensure that the original group of 89 responders was representative of the entire sample. Demographic statistics for the telephone responders is presented below in Table 13.

Table 13. Demographic Statistics of Telephone Responders.

Category	Total n		Non-persisters		Persisters	
Total	20	(100%)	7	(35%)	13	(65%)
Male	10	(50%)	4	(40%)	6	(60%)
Female	10	(50%)	3	(30%)	7	(70%)
Caucasian	9	(45%)	4	(44%)	5	(56%)
Non-white	11	(55%)	3	(27%)	8	(73%)
30+ credits	9	(45%)	4	(44%)	5	(56%)
<30 credits	11	(56%)	3	(27%)	8	(73%)
2.0+ GPA	19	(95%)	7	(37%)	12	(63%)
<2.0 GPA	1	(5%)	0	(0%)	1	(100%)

The telephone responders were a group of 20 who answered the SACQ as they remembered their situation being in October of 1995. Of the 20, 7 were non-persisters (35%) and 13 were persisters (65%). Like the total non-responder group, the percentage of non-persisters was higher for the telephone responders than for the group of initial responders (25%). The percentages of male/female responders was even at 50% each. However, the male/female percentage for the initial responder group was 42% male and 58% female. Forty-five percent of the telephone responders were Caucasian while 70% of the initial responders were Caucasian; 56% of the telephone group were non-white compared to 30% of the initial responders.

Comparing the total credits accumulated for the two groups, 67% of the initial responders and 45% of the telephone responders had accumulated more than 30 credits. About one-third (33%) of the initial responders and 56% of

the telephone responders had accumulated less than 30 credits. Ninety-five percent of the telephone responders had a GPA above 2.0 compared to 88% of the initial responders.

With the exception of percentage split on race, the telephone responders were very similar in demographic characteristics to the initial responder group. Table 14 presents the mean scores for the telephone responders on the three independent variables.

Table 14. Descriptive Statistics for Telephone Responders on the Independent Variables.

Variable	Possible range of scores	Minimum	Maximum	Mean	Standard Deviation
Academic Integration	24-216	117	210	168.2	24.75
Social Integration	20-180	77	169	132.8	23.96
Attachment	15-135	61	135	104.8	18.99

The mean score on the academic integration variable for the initial responder group was 160.2; for the telephone responders it was 168.2. The mean score on the social integration variable for the initial responder group was 119.3; for the telephone responders it was 132.8. The mean score on the attachment variable for the initial responder group was 107.2; for the telephone responders it was 104.8.

In order to compare the two groups for statistical purposes, t-tests were run using MSU Stat on the group means for the three independent variables. Table 15 presents the t-test results for the means of the three independent

variables compared for the two responder groups (initial and telephone).

Table 15. Comparison of Group Means on the Independent Variables.

Comparison of Group Variances			
	AI	SI	A
F (19, 88) =	.7427	.7422	1.028
P-value =	.4697	.4687	.8766
Differences in Group Means			
	AI	SI	A
Dif. in Means =	8.301	13.38	-2.33
T (DF = 107) =	1.196	1.99	-.5015
P-value =	.2345	.049	.6171

The results of the comparison of group variances indicate none of the variances are statistically different. The Fs for the academic integration variable, social integration variable, and attachment variable are not significant as indicated by the p-values of greater than .05. From the calculated difference in group means of the initial responders and the telephone responders, the t for academic integration and attachment are not significant (p-values of .234 for academic integration and .617 for attachment). The t for social integration is calculated as significantly different for initial responders compared to telephone responders (t=1.99, p-value is .049).

The telephone responders constitute an additional group to compare with the initial responders. The two groups are very similar. However, the differences argue for caution when inferring results of the 89 initial responders to the population.

Prediction of Persister/Non-persister Status

In order to determine the accuracy of this set of variables (academic integration, social integration, and goal commitment) in predicting the status of each student, Y^s were calculated using the regression equation generated by the multiple regression. Each student with a Y^ of less than .5 was predicted to withdraw (non-persister). Each student with a Y^ of .5 or greater was predicted to persist. Table 16 shows the Y^ and status for each student. It is organized as case number (student), calculated Y, predicted status of that student based on the calculated Y, and actual status of that student according to the data.

As indicated in Table 16, all but one of the 67 persisters were correctly predicted. Student #23 was predicted to withdraw given the Y^ of .4046. This student was a persister while scoring the lowest of the responders on both the Social Adjustment subscale and the Goal Commitment subscale. This student began their MSU career in Fall 1995, with 60 credits. This student achieved a GPA of 4.0 in that semester and a 3.2 GPA the following Spring