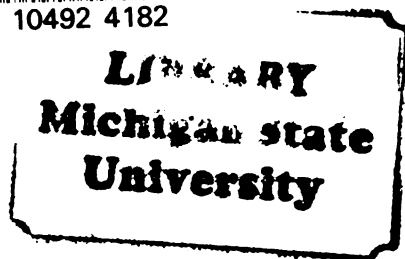




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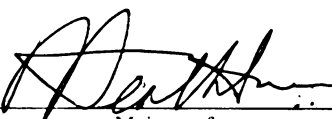
A STUDY OF INSTITUTIONAL ATTRITION AMONG
FIRST-TIME COLLEGE FRESHMEN: FALL 1981

presented by

William James Latta

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Administration and
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A STUDY OF INSTITUTIONAL ATTRITION AMONG
FIRST-TIME COLLEGE FRESHMEN: FALL 1981

By

William James Latta

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

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1983

ABSTRACT

A STUDY OF INSTITUTIONAL ATTRITION AMONG
FIRST-TIME COLLEGE FRESHMEN: FALL 1981

By

William James Latta

The purpose of this research was to conduct an institutional study of why freshmen who entered college during Fall Term 1981 did not return to resume their degree work in Fall 1982. The investigation was conducted within the framework of Tinto's (1975) conceptual model and focused on the problem of the voluntary dropout. Students chosen for this study were college freshmen who enrolled in a four-year program during Fall Term 1981, were enrolled during Winter Term 1982, and lived in university residence halls.

The general design of this research was longitudinal, with data collections occurring before college enrollment and at the midpoint of the first academic year. Selected items from the Student Profile Section of the American College Test provided the pre-enrollment information. A questionnaire developed from two previously researched instruments was used to obtain data about the students' college experiences. Both data collections were held until Fall Term 1982, or the beginning of the second year. At that time, the sample was divided into two groups, returning and nonreturning, with academically dismissed students deleted.

The procedures of discriminant analysis and cross-tabulation with chi-square were used to test the eight hypotheses of this investigation. The data analysis revealed that substantive discriminant functions could not be found distinguishing returning from nonreturning freshmen. However, the chi-square tests did reveal moderate differences.

In considering the specific variables that affected student attrition in this study, high school GPA, class rank, and the degree of certainty that one has toward his/her college major were found among the precollege characteristics. The number of collegiate extracurricular activities, family interactions, perceived intellectual development, amount of perceived faculty concern for student development and teaching, and college GPA were significant among the college-experience variables. Additional differences predicted between male and female students were found.

This study also demonstrated the usefulness of Tinto's model in explaining the dropout process for nonreturning as well as retention of returning students. However, it became clear that the model is far from complete as there are some obvious shortcomings in its ability and need to account for attrition influences that exist outside the institution.

The results of this study indicated a need to further research and understand the specific nature of college experiences that contribute to attrition. Additionally, influences external to the institution warrant investigation to gain a more complete understanding of the problem.

ACKNOWLEDGMENTS AND DEDICATION

It has often been said that thesis research is a solitary project. Images of a dimly lit room, pieces of crumpled-up paper scattered about, and a lonely figure poring over numerous notes and computer printouts appear to fit this notion. However, my purpose here is to demonstrate that the exact opposite was my experience. In fact, there were so many who gave their active support and ongoing encouragement that there was never a question of "If I finish," but "When I finish"!

I would like to begin by thanking my doctoral committee, who gave me ongoing and sound guidance throughout the years of my program. Before his departure for Illinois, Dr. Gary North provided me with solid direction and leadership as my Chairman; he will always be an important model in my career. Dr. Richard Featherstone, my current Chairman, was always glad to see me and could always be counted on for his warmth and reassuring smile. I have been fortunate to have learned some of his insights and to have grown from his knowledge shaped through wisdom and experience. Dr. James Rainey was instrumental in the formation of my cognate and never hesitated to give me careful and candid advice; I quickly learned to implicitly trust his judgment. Dr. Eldon Nonnamaker willingly joined my committee at Dr. North's departure; his assistance and years of administrative

experience were always gratefully respected. Dr. Fred Ignatovich has had a greater influence on me than he will know or than can be measured. He has always represented a strength of competence and rigor that is the most necessary element of any doctoral program. I will always value and continue to integrate the knowledge from his courses as well as carry a deep admiration for his critical observations.

During the course of my research, three people were key elements in smoothing out the rough edges and helped to keep me focused on progress. Dr. Jim Studer quickly lent his support and enabled me to cut through the initial red tape of collecting a sample. I always felt his enthusiasm and positive support. Jim (soon to be Dr.) Wall has provided me with more tangible support and encouragement than could be imagined. Jim always had an understanding ear, a foot squarely planted in my back end, and arms strong enough to give me the room to finish this task; when the going got tough, Jim kept me going. Finally, there is one man who deserves more credit than any computer program could produce. Dr. Bill Rosenthal was nothing short of a miraculous discovery. There is no question that Bill's help and patience made this project possible. His computer expertise and technical knowledge were invaluable as tapes were merged, samples were coded, variables were recorded, tables were produced, and statistical tests were performed. I only hope to be able to help some other doctoral candidate as Bill has helped me. He is truly representative of my experience at Michigan State.

The completion of this dissertation and doctoral program represents a dream fulfilled. Four people intimately shared in this dream, and it is to them that my degree is dedicated. My wife has given more than could be measured by any yardstick known to history. She gave me more time to study than could be asked, listened to more term paper rewrites than could be expected of an editor, allowed me more time in the library than would be healthy for a bibliographer, and tolerated my outbursts of frustration beyond the point justifiable in a marriage. She has been my most important continuous and unconditional source of strength and reassurance. My parents, though they may not realize it, gave me the personal foundation to reach this moment. Mom has given me a sense of optimism and hope throughout my life that has equipped me with the vision to see possibilities, not barriers. I have also been fortunate to have gained her sense of humor. This gift has always helped me thoroughly to enjoy a humorous story and to keep the details of life in perspective. Dad has taught me the importance of setting high standards without ever compromising my personal integrity. From his guidance I've come to know thoughtfulness, understanding and patience, critical analysis, and the respected gift of persistence. Dad has not always received the credit he deserves in my growth, but he should know that the positive influence of his life on mine has been instrumental not only in reaching this goal but many more to come. My son, who is too young to know what all of this means, deserves the final recognition. It is hoped that this dissertation will be a symbol of the importance of dreaming dreams and then setting out to

accomplish them. It now becomes the task of his father to expose him to the fullness of life's possibilities and to instill in him a sense of purpose that he feel compelled to follow no one's footsteps but his own.

TABLE OF CONTENTS

	Page
LIST OF TABLES	viii
LIST OF FIGURES	x
 Chapter	
I. INTRODUCTION	1
Purpose of the Study	4
Need for and Importance of This Study	5
Definition of Terms	6
Background of the Conceptual Model	7
Delimitations of the Study	13
Hypotheses Tested	14
Design of the Study	15
Limitations of the Study	18
Overview of Subsequent Chapters	19
II. REVIEW OF THE LITERATURE	21
Introduction	21
The Rate of Attrition	23
Precollege Characteristics and Their Importance for the Dropout	29
Attrition: Toward a Formulation of Theory	44
Summary of Chapter II	66
III. DESIGN AND METHODOLOGY	70
Hypotheses	71
Population and Sample	72
Instrumentation	75
Data Collection and Statistical Analysis	81
Summary	84
IV. PRESENTATION AND ANALYSIS OF THE DATA	86
Introduction	86
Analysis of the Hypotheses	89
Summary	133

	Page
V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	137
Summary: Development of the Study	138
Findings and Interpretation Within the Framework of Tinto's Model	141
Verification of Data Coding and Analysis	155
Conclusions	158
Recommendations for Further Research	160
Reflections	162
APPENDICES	164
A. ITEMS SELECTED FROM THE AMERICAN COLLEGE TEST: STUDENT PROFILE SECTION	165
B. QUESTIONNAIRE COVER LETTER AND COLLEGE EXPERIENCES SCALE II	170
BIBLIOGRAPHY	175

LIST OF TABLES

Table	Page
1.1 MSU Student-Enrollment Projections, 1980 to 1985	3
2.1 National Rates of Attrition by Research Source	26
2.2 Persistence/Attrition of Domestic MSU Students (January 15, 1982)	27
3.1 Comparison of Subscale Reliability Coefficients--CES II . .	80
4.1 Sample Data	88
4.2 Chi-Square of Significant SPS Variables: Total Group . . .	
4.3 Chi-Square of Significant SPS Variables: Females	92
4.4 Chi-Square of Significant SPS Variables: Males	93
4.5 Stepwise Selection Summary of SPS Variables for the Total Group	95
4.6 Stepwise Selection Summary of SPS Variables for Females .	97
4.7 Stepwise Selection Summary of SPS Variables for Males . .	97
4.8 Chi-Square Results on the Variable, Participation in School Activities, for the Total Group	102
4.9 Chi-Square Results on the Variable, Number of Family Interactions, for the Total Group	104
4.10 Chi-Square Results on the Variable, Intellectual Development, for the Total Group	105
4.11 Chi-Square Results on the Variable, Current Grade Point Average, for the Total Group	106
4.12 Chi-Square of Significant CES II Variables for Female Students	109
4.13 Chi-Square of Significant CES II Variables for Male Students	112

Table		Page
4.14	Stepwise Selection Summary of CES II Variables for the Total Group	115
4.15	Discriminant Analysis Classification Summary: CES II Variables: Total Group	117
4.16	Stepwise Discriminant Summary of CES II Variables for Females	118
4.17	Stepwise Discriminant Summary of CES II Variables for Males	118
4.18	Comparison of Discriminant Functions of SPS and CES II Variables for the Total Group	121
4.19	Comparisons of Discriminant Functions of SPS and CES II Variables for Females and Males	122
4.20	Stepwise Selection Summary of CES II and SPS Variables for the Total Group	127
4.21	Stepwise Selection Summary of CES II and SPS Variables for Female Students	128
4.22	Stepwise Selection Summary of CES II and SPS Variables for Male Students	130

LIST OF FIGURES

Figure	Page
2.1 A Conceptual Model for Dropout From College	59

CHAPTER I

INTRODUCTION

During the late 1950s and into the 1960s, higher education was one of the most rapidly expanding institutions in the United States. Under the presidential administrations of John Kennedy and Lyndon Johnson, higher education enjoyed a wealth of public and private support. At that time, a favorable growth climate brought increasing enrollments, many requests for research and public service, and expansion of facilities and faculties (Garbarino & Aussieker, 1975). However, as higher education encounters the demands of a new decade, the 1960s can be viewed as the "golden years" and a period that brings only pleasant memories in the wake of uncomfortable complexities in the 1980s.

Many issues are confronting institutions of higher education during the current period. Some of the more pertinent challenges requiring improved problem-solving abilities are declining resources, increased planning with prioritization of programs, use of management systems, and decreased real financial support (Gardner, 1977; Pifer, 1976). Not the least problem, and perhaps one of the most important ones for institutions in the 1980s, is the maintenance of enrollment levels. A recent report from the Carnegie Commission on Higher Education indicated that enrollment declines during the 1980s will

present a problem with such severity that it will create a "new revolution" in academia. Although small liberal-arts colleges appear to be most vulnerable, large public universities, particularly one that was the focus of this study, will also be affected (Scully, 1980).

Enrollment levels are influenced by new enrollees each year (entering freshman classes), students who return or transfer into the school from a previous enrollment, and the rate at which students drop out before completing their degree. When one of the first two groups of students declines, institutional officials are hopeful that the other groups will offset any noticeable differences. However, when new-student enrollment is down along with that of returning and transfer students and the rate of attrition is at an unacceptable level, the educational quality of the institution, its financial future, and even its survival can be affected (Scully, 1980).

To illustrate the seriousness of enrollment declines at one institution, Michigan State University, a large midwestern land-grant school, projects a 20% decrease in the undergraduate population by 1985 (Table 1.1). In Fall 1980, the institution enrolled 36,620 undergraduate students; however, projected enrollment in 1985 is expected to be 29,400 undergraduates. Although somewhat compensated by readmits, transfers, and returning students, the overall enrollment decline is only marginally offset.¹ Given this rate of decline, the

¹Enrollment figures were obtained from a 10-13-81 memorandum distributed by the MSU Office of Planning and Budget, Michigan State University. Figures were compiled by Dr. William Sperber.

Table 1.1.--MSU student-enrollment projections, 1980 to 1985.

Undergraduate	1980	1981	1982 ^a	1983 ^a	1984 ^a	1985 ^a	Cumulative Change From 1980
New first time	7,549	6,288 (-17%)	6,750 (+7%)	6,325 (-7%)	6,125 (-7%)	5,925 (-3%)	1,624 (-22%)
Transfer	2,334	2,043 (-12%)	2,100 (+3%)	2,100 (0)	2,000 (-5%)	1,900 (-5%)	434 (-19%)
Readmitted	1,231	1,163 (-6%)	1,200 (+3%)	1,200 (0)	1,100 (-8%)	1,100 (0)	131 (-11%)
Returning	24,506	24,863 (-4%)	22,850 (-8%)	21,975 (-4%)	21,175 (-4%)	20,475 (-3%)	5,031 (-20%)
Total	36,620	34,357 (-6%)	32,900 (-4%)	31,600 (-4%)	30,400 (-4%)	29,400 (-3%)	7,220 (-20%)

^aFigures for these years are projections.

attrition rate of undergraduates and their reasons for leaving the institution become even more critical and alarming concerns.

Students who do not return to an institution tend to do so for one of three reasons. Either the student has graduated, was academically recessed, or voluntarily elects not to return. As an example, it was found that approximately 17 to 20% of new freshman enrollees at MSU are not expected to return for their sophomore year. Further, a majority of these students make a voluntary decision not to return, as opposed to being academically recessed, dismissed, or suspended for disciplinary reasons (Tinto, 1975). During a time of increasing enrollments, this rate of drop out from the freshman class may not be of major concern. However, given the current circumstances compounded by other problems mentioned at the beginning of this chapter, attrition of almost one-fifth of each new entering class becomes a major concern.

Purpose of the Study

The purpose of this study was to examine the reasons why freshmen who entered Michigan State University during Fall Term 1981 did not return to resume their degree work in the Fall of 1982. This investigation was conducted within the framework of Tinto's (1975) model of why students drop out. The model was particularly appropriate in that although it has implications for students who drop out from higher education in general, it also focuses on institutional attrition. Further, initial research (Baumgart & Johnson, 1977; Terenzini & Pascarella, 1980; Munro, 1980) has begun to validate

various components of the model, supporting its usefulness in explaining rather than simply describing students who do not persist. Therefore, following from this framework, variables were examined that discriminate between students who leave MSU and those who return for the following year. Precollege characteristics and experiences on the campus were the categories under which more specific variables were studied.

Need for and Importance of This Study

The intention of this research was to investigate student attrition at one midwestern institution, Michigan State University. There has not been a study on this subject in the past ten years at MSU, and studies before that time were limited because they sought only to describe characteristics associated with dropout behavior and did not try to explain the findings within the framework of a theoretical model. At a time when enrollments are declining, it becomes even more necessary to understand why students who initially enroll do not return.

The results obtained from an individual-institution study may have many uses. Initially, the results can be compared with national findings to determine the degree of similarity between the two settings. Also, institutional programs, services, and college personnel can benefit from the identification of those aspects of campus life most closely related to attrition. Further, the findings may illuminate those components of the institution that are positively related to persistence and eventual success of the student.

In his recent book, Four Critical Years, Astin (1978) wrote that unfortunately, more decisions are made in higher education on the basis of financial considerations than on sound educational research. He went on to say that it is therefore incumbent on researchers to demonstrate that studies also have a cost/savings-benefit capability. Toward this end, it is hoped that the findings of this study will help provide additional information for improving an individual student's success. Astin (1975) wrote that it may, in fact, be more cost effective to take additional steps to retain those enrolled than to incur costs of recruiting and selecting students to replace those who have not returned.

Definition of Terms

First-time college freshman: An MSU student who entered college for the first time at MSU, as indicated by the appropriate code on the Student Master Data Tape (SMDT), during Fall Term 1981.

Institutional attrition: The act of leaving Michigan State University before completing the degree requirements for a bachelor's degree.

Nonreturning student: A first-time college freshman who did not return to Michigan State University for his/her second year after three consecutive terms of enrollment (Fall 1981, Winter 1982, and Spring 1982).

Persister or returning student: A first-time college freshman who returned to Michigan State University for his/her second year after three consecutive terms of enrollment or Fall Term 1982.

Goal commitment: Refers to the degree of decidedness toward the actions of obtaining a college degree (Tinto, 1975).

Institutional commitment: Refers to the degree of decidedness that a person has toward attending one particular institution over another (Tinto, 1975).

Academic integration: The degree to which the student becomes successfully involved in the academic process in the college or university setting. Indications of this type of integration would be grade point average and the individual's amount of involvement in academic-related activities, as well as the student's attitude toward his/her own level of intellectual development (Tinto, 1975).

Social integration: The degree to which the student becomes successfully involved in nonclassroom aspects of university life. Indicators of this type of integration would be the amount of involvement in peer-group interactions, nonclassroom faculty contacts, extra-curricular activities, work activities, and other interactions on the campus.

Background of the Conceptual Model

Research related to the college-student dropout has been extensive, varied, somewhat contradictory, and limited in its ability to explain why students leave particular institutions and/or higher education in general. A majority of studies from approximately 1920 until early 1964 have focused on the rate of attrition and precollege characteristics associated with the undergraduate dropout. Not until Spady's study in 1970 was a model or comprehensive theoretical

framework proposed that attempted to synthesize the characteristics associated with dropouts and that sought to explain attrition as an interactive process between the individual's attributes and the college environment. Spady's study stimulated three subsequent attempts to develop explanatory models, with the most recent and comprehensive framework attributed to Vincent Tinto in 1975.

The first study considered to be a hallmark in attrition research was conducted by Iffert in 1957. Although his study was a follow-up to McNeely's (1938) work, it drew national recognition because of the scope of his work and provided a stimulus that led to many more intensive future efforts. Essentially, Iffert studied characteristics (background, residential, and academic factors) that were thought to discriminate persisters from dropouts. Also interested in the national rate of attrition, he found that 40% of entering students graduate within four years, an additional 20% of all entering students complete a baccalaureate beyond the four-year period, and the remaining 40% never finish their degrees.

Many precollege factors associated with persistence and attrition have been documented in the literature. Two of the better-researched characteristics have been the socioeconomic status of the family and the academic preparation and high school success of the student. Astin (1964) and Panos and Astin (1968) found that students who came from families that were well educated, tended to be more affluent, and were academically successful as high school students had higher persistence rates than those students who came from other backgrounds. However, Trent and Medsker (1968) disputed these

findings and presented the argument that precollege characteristics associated with family background probably have more to do with the initial choice of going to college as opposed to significantly influencing completion.

Other studies, despite contradictions in the literature, have continued to assert the importance of precollege characteristics. Gurin, Newcomb, and Cope (1968) studied parents' religious affiliation, level of education, rural-urban background, size of high school, high school class rank, and scores from the Scholastic Aptitude Test. Their major finding was that precollege characteristics and background have significant effects on student attitudes and attrition rates. Another variable found to be associated with attrition rates in the category of background characteristics is the student's own evaluation of the high school facilities, curriculum, and instruction. Summerskill (1962) found that students who experienced academic difficulty in college and subsequently dropped out placed a majority of the responsibility on the poor quality of their high school.

Also, the importance of formulating goals and the expected level of performance have consistently been shown to be precollege discriminators of persistence and attrition. Thistlethwaite (1963), Panos and Astin (1967), Wessel et al. (1978), and Hutchison and Johnson (1980) all found that students who had chosen a field of study, expected to perform well, had planned to graduate, and/or intended to go to graduate school were more likely to persist in college than were other students who did not form these goals before

college enrollment. These few studies, citing the above-mentioned precollege variables, are only a part of the large volume of research conducted in this area.

In an attempt to bring coherence to the attrition studies associated with precollege background and experiences, as well as other findings concerning why students do not continue their education, three major comprehensive literature reviews were conducted by Spady (1970), Cope and Hannah (1975), and Pantages and Creedon (1978). Although a more detailed review of their findings is presented in Chapter II, one of their primary conclusions was that dropping out is the result of a complex process over time. This process includes the student's entering characteristics as well as influences of the collegiate environment operating in an interactive manner. Viewed in this way, the acts of dropping out or staying in college are the result of a much more complex interaction of variables than originally thought.

Building from previous attrition research and Durkheim's study of suicide, Spady (1970) constructed the first process model explaining attrition/persistence behavior. His model theorized that individual student attributes interact with various sources of demand in the college environment, such as academic courses, faculty, administrators, and peers. Sources of demand, primarily from the social and academic systems of the college, present opportunities for successful or unsuccessful integration into the collegiate environment. Spady concluded that the student either finds rewards in these

two areas or experiences frustration and lack of integration, resulting in the eventual dropout behavior.

Kamens (1971) and Rootman (1972) also hypothesized that the college environment is a critical determinant in the student's persistence toward a college degree. Kamens studied college size and its effect on the "status allocating" ability of the institution through college prestige and quality. Rootman, in line with Spady's work, proposed a "person-fit" model of college-student interaction. Similar to the work of Getzels and Guba (1954, 1963), he sought to explain dropout behavior as the result of dissatisfaction with the college environment. The dissatisfaction is the result of an incongruence that exists between individual background characteristics and attributes of the student (Getzels and Guba labeled these "needs disposition") and the role expected of the students by the college (Getzels and Guba labeled this in the same manner--"role expectations"). Essentially, the student discovers that he/she does not fit the environmental expectations, begins to experience conflict and dissatisfaction, and eventually copes with this experience by dropping out.

Finally, Tinto (1975), after a comprehensive study of previous frameworks, developed a "conceptual schema for drop out from college" (p. 95). He proposed that students' precollege characteristics lead to the initial formulation of two types of commitment. One type of commitment is related to the idea of completing a college degree (goal commitment), whereas the other is to the school the student attends (institutional commitment). Once the student begins the degree program, interactions occur in the social and academic

subsystems of the college environment. The experiences on the campus then alter initial commitments as the student finds either integration into or isolation from the academic and social arenas. These alterations, in turn, cause a new formulation of goal and institutional commitments, leading to eventual completion or drop out from either the specific institution or higher education altogether.

Terenzini and Pascarella (1980) conducted a series of studies at Syracuse University that tested Tinto's model. Their research found support for the model as a viable framework within which attrition/persistence can be explained. They found that students who persist or withdraw are not "mere reflections" of their precollege characteristics but are subject to the influences they find in the institution they attend, both academically and socially. However, their work, by their own admission, is limited in that the model was tested at only one institution, and the students may not have been representative of students at other schools. Second, as Tinto's model focused primarily on a particular institution as opposed to higher education in general, findings about the environment at one school may not accurately represent the environment at other schools. Third, their studies, although using a variety of precollege variables and particular methodology to measure social and academic integration, "probably only begin to reflect the complexity of the model's major constructs" (p. 349), pointing to the need for additional research. Finally, their research did not take into account such variables as precollege commitment toward obtaining a degree, expected level of academic performance and success, degree of

decidedness about a particular program of study, or expected level of academic assistance that would be desired for successful completion from the prospective student's point of view.

Delimitations of the Study

This research study was delimited to one institution within higher education: Michigan State University. Further, the subjects of this thesis were first-time college freshmen who entered during Fall Term 1981, lived in university residence halls, were enrolled during Winter Term 1982, and were not enrolled in any of the two-year degree programs.

Previous literature supports the recommendation that institutions must conduct their own research to identify accurately the reasons why students leave school. In this way, more appropriate corrective action can be taken to reduce the rate of institutional attrition (Hutchinson & Johnson, 1980). As Terenzini (1980) wrote, "Institutional contributions to attrition can be more clearly delineated and assessed. . . . Results will have greater potential for valid interpretation and wider administrative planning utility."

The entering-freshman class was chosen for this study because of its projected high rate of attrition, approximately 17 to 20% between the freshman and sophomore years. A study conducted by the institution's Office of Planning and Budget and records from the Office of the Registrar showed that the freshman year has the highest

dropout rate of the four classes.¹ On a national level, high rates of attrition were also reported by Cope and Hannah (1975) at the end of the first year. Their research cited findings from McNeely (1938), Iffert (1957), Summerskill (1962), Skaling (1971), Panos and Astin (1968), and Astin (1972). These investigations showed consistently across all the studies except McNeely's, which reported 60%, that approximately 40% of the entering freshmen do not complete the baccalaureate degree. Eventual attrition of MSU students has reached this level (45% from the 1975 class), but because of the period under study in this investigation, it was expected that the rate would be in the range of 17 to 20%.

Hypotheses Tested

In view of the purpose of this study, the abbreviated background literature that has been presented, and the review of literature presented in the second chapter, the following hypotheses will be tested:

1. The Student Profile Section of the American College Test, which will be used to measure entering-freshman characteristics, will successfully discriminate between freshman-year persisters and nonreturning students.
2. The precollege characteristics of family income, high school academic performance, and educational aspirations (measured by decidedness of college major, expected level of college performance, and college degree) will be the best discriminating variables between freshman persisters and nonreturning students among all measured prematriculation variables.

¹Summary statement from interviews held with Dr. William Rosenthal, MSU Office of Budget and Planning, and Phyllis Wilke, Assistant Registrar, November 4, 1981.

3. The College Experiences Scale II, which will be used to measure social and academic integration, will successfully discriminate between freshman-year persisters and nonreturning students.
4. Variables related to social and academic integration will be better discriminators between returning and nonreturning students than precollege characteristics.
5. The School Activities, Peer, and Faculty Interactions Scales measured by the CES II will be the most powerful discriminating scales between returning and nonreturning freshmen of any variables found to discriminate between the two groups along the social-integration dimension.
6. Factors related to academic integration will be better discriminators between returning and nonreturning students than those factors related to social integration.
7. The CES II scales that measure the amount and quality of faculty contact will be the single most powerful discriminating variable between freshman-year persisters and nonreturning students of any factor measured in the study.
8. Those variables that successfully discriminate between returning and nonreturning students will be different when controlled for sex.

Design of the Study

The design of this study was longitudinal rather than post-hoc or cross-sectional. Specific to this type of research, the longitudinal design has been found to be more advantageous and superior to the other two approaches.

The post-hoc or autopsy design calls for the collection of information from students who have already dropped out. Typically, this method encounters low response rates, does not have the benefit of comparison groups, and the data only provide descriptions of students who left. Also, it has been found that students who are

surveyed after they drop out may tend to rationalize their responses, as opposed to giving the "true reasons."

The cross-sectional design makes some improvements on the above approach in that it provides for a comparison group. Using this method, data are collected from students who are currently enrolled (usually late into their first year) and held until the beginning of the next academic year. At that time, the students who were surveyed are separated into two groups, depending on whether or not they returned to the institution. Data for the two groups are then compared. This design allows for a higher response rate but is still limited in that it does not take into account prematriculation data (Terenzini, 1980).

The longitudinal design further improves on the cross-sectional approach. Using this method of gathering information while the student is still enrolled, it also requires the researcher to collect pre-enrollment data. According to Terenzini (1980), "institutions that participate in national precollege student information programs, such as . . . the American College Testing Program's Assessment program, have an advantage over institutions that do not" (p. 262). With these two sets of data, multivariate analysis can be performed taking precollege differences into account. This design is not only supported by this more thorough type of analysis, but it also affords a fairly high response rate, a comparison group as mentioned, and specific to this study, provides information that is required for Tinto's (1975) model (Lea, Sedlacek, & Stewart, 1979).

To facilitate the use of the longitudinal design for this study, a random sample of first-time college freshmen who entered during Fall Term 1981 and were enrolled Winter Term 1982 was drawn, selecting every "nth" student.

After selecting the sample, two sources of information were collected. The American College Test Student Profile Section (SPS) provided precollege characteristics and demographic data on the sampled students, and a questionnaire, the College Experiences Scale II (CES II), was administered the seventh week of Winter Term 1982. Both sources of information were held until after Fall Term registration in September 1982. At that time, data for those students who returned for Fall Term were separated from the data for those students who did not return. With the data separated into two groups, statistical analysis was begun.

To test the hypotheses, the subprograms Crosstabs, Discriminant, and Stepwise Discriminant from the software package Statistical Analysis Systems were used. The Crosstabs program provided a chi-square analysis testing for independence between the nonreturning and returning students on the variables chosen for this study. The results from the chi-square analysis can be suggestive of variables that will discriminate between the groups. However, the procedures Discriminant and Stepwise Discriminant not only tested which variables actually discriminate between the groups but how well they discriminated. "The mathematical objective of discriminant analysis is to weight and linearly combine the discriminating variables in some fashion so that the groups are forced to be as statistically distinct

as possible" (Nie et al., 1975, p. 435). Once discriminant functions have been computed, they can be analyzed by a series of statistical tests to measure the success with which the variables actually discriminate between the groups.

Limitations of the Study

Delimitations of this research study--that is, the focus and scope of the research--have already been examined earlier in this chapter. The purpose of this section is to present the reader with the inherent weaknesses of this thesis that are not within the researcher's ability to control. However, these weaknesses are not so great as to preclude the value of this study, but rather to assist in placing the results and subsequent conclusions in perspective.

One limitation is that the researcher must rely on the authenticity of the student's answers found within the SPS and CES II. A risk is run in that the responses may be more reflective of subjective feelings about facts as opposed to the facts themselves.

An additional weakness lies in the instruments used to measure the students' precollege characteristics as well as their social and academic integration on the campus. Tinto's model suggests that factors leading to a student's feeling of social and academic integration or isolation are very complex. The researcher has relied on the instruments designed with this model in mind; however, they may not contain a complete representation of the variables required to uncover the complexity of the model.

It is also recognized that the results of this study were specific to Michigan State University and a defined population of students within that setting. To the extent that other institutions resemble MSU and its students, the findings are generalizable. Yet, as pointed out earlier, and serving as a part of the rationale for this study, other institutions should develop their own data to assess more accurately the specific circumstances that affect their attrition and persistence rates.

Finally, this investigation was intended to provide a back-drop for further study and follow-up on the MSU campus. Restricted by various resource limitations, this research was not able to exhaust all the possible reasons that are associated with returning and non-returning freshmen. Additionally, those variables found to be related to freshman-year attrition may not be representative of other classes of students. Additional research and study is warranted for sophomore-, junior-, and senior-year attrition.

Overview of Subsequent Chapters

The introduction and background to the research problem was presented in this first chapter. Specifically, the purpose and value of the study, definition of terms, hypotheses, design, delimitations, and limitations of the study were all covered in Chapter I.

Chapter II provides a more detailed literature review pertinent to this thesis. The review is presented in three parts. Part I reviews studies of national attrition rates and their comparison to MSU figures. The second part of the chapter presents research

information relative to precollege characteristics, while the third section presents a development of studies that have led up to Tinto's model and research that has begun to test it. It will also be found that the last part of the chapter more clearly describes the research previously cited to support the research hypotheses.

Chapter III reviews the research design, population sample, instrumentation, and data-analysis techniques.

Chapter IV follows from the third chapter by presenting the findings of the data analysis.

The fifth and final chapter draws conclusions from the findings, poses recommendations for further investigation, and summarizes the entire research project.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

It has already been pointed out that the literature pertaining to college attrition is extensive. Studies that date back to 1924 have principally covered individual characteristics associated with dropping out and rates of attrition (Summerskill, 1962). The scope of individual attributes that have been studied includes personality characteristics, socioeconomic status, high school academic achievement, high school extracurricular accomplishments, age, sex, financial assistance, hometown location and size, predicted scholastic aptitude, personal motivation, clarity of and commitment to goals, and parental and peer-group influence. More recently, environmental characteristics of the collegiate setting relative to their influence on attrition have been researched (Pantages & Creedon, 1978). Yet, despite the range and breadth of these many studies,

The failure of past research to delineate more clearly the multiple characteristics of dropouts can be traced to . . . inadequate attention given to . . . the development of theoretical models that seek to explain, not simply describe, the processes that bring individuals to leave institutions of higher education. (Tinto, 1975, p. 1)

Recognizing this limitation, research by Pervin and Rubin (1967), Feldman and Newcomb (1969), Nasatir (1969), Spady (1970), Kamens (1971), Rootman (1972), and Tinto (1975) has begun to synthesize

and integrate previous work into a more meaningful and understandable whole.

With respect to studies that have documented attrition rates, although many, they are equally plagued by problems of interpretation. Difficulties are encountered in three areas: definitions of dropout, the time allowed for follow-up, and the "representativeness of samples used" (Kolstad, 1977, p. 4). However, a general review of findings from four-year college studies in comparison with rates at Michigan State University provides a reasonably interesting standard of reference. Such a review is forthcoming in this chapter.

Because of the vast amount of literature that exists on the college dropout and the excellent comprehensive reviews of Spady (1970), Tinto (1975), Cope and Hannah (1975), and Pantages and Creedon (1970), an additional review in this thesis would be supererogatory (Baumgart & Johnstone, 1977). However, with the intention of providing focus to the current research and a backdrop to the theoretical framework of Tinto's (1975) model, major findings are reviewed. Specifically, findings from the comprehensive reviews that correspond to the selected individual characteristics studied in this thesis are presented. In addition to this research, studies that preceded and had a strong bearing on the development of Tinto's model (relating more closely to the interaction of individual and environmental characteristics) are also important to discuss.

Therefore, this chapter is organized into three sections. Part I briefly reviews national studies of attrition rates in comparison to those found at Michigan State University. The second part of

this chapter reviews research findings of selected precollege characteristics that are associated with collegiate attrition. The final section of this chapter reviews studies that provided the theoretical underpinnings for Tinto's model. A review of the model is presented, as well as the findings of follow-up studies to Tinto's concepts. Parts II and III are intended not only to familiarize the reader with the subject area, but also to focus and support the research hypotheses stated in the first chapter.

The Rate of Attrition

Nationally, Summerskill (1962) has been one of the most often quoted researchers on attrition rates. He reviewed more than 35 studies conducted during the period from 1913 to 1953, covering both national and institutional samples. As a result of his work, like Kolstad (1977), he also cautioned readers about the definitional problems with the phrase "attrition rate." Some studies only reference students who drop out at the end of one year, two years, etc., and return or transfer at a later time. Other investigations examine the permanent dropout from higher education. Regardless, Summerskill cited the more well-designed national studies of McNeeley (1937) and Iffert (1957) as presenting results from more carefully researched efforts.

McNeeley (1937) found that 62% of the entering students to a particular institution left within four years. Of those students who left, 17% transferred, leaving approximately 45% who permanently dropped out. Iffert (1957) found that approximately 40% of the

entering students permanently drop out from higher education. Both authors also found a slightly higher rate in the less selective public colleges and universities as opposed to the more exclusive private institutions. Further, one-half of the total rate who dropped out did so before the sophomore year. It is important to consider that not only do freshmen have the highest rate of not returning for their second year (based on these and other studies), and given the theory of the dropout process postulated by Tinto (1975), it may reasonably be concluded that they also have the highest percentage of permanent dropout of any class.

Following the work of McNelly and Iffert, Eckland (1964a, 1964b) published two studies that challenged Summerskill's analysis of previous work. He found that the number of students who re-enrolled at another institution or eventually returned to their first school of matriculation was higher. His work demonstrated that just over 70% will graduate from some institution, and this may run as high as 74%. Therefore, the permanent dropout rate is reduced to an amount of approximately 30%. However, while Eckland showed a variation from McNeeley and Iffert, Summerskill did note that he found broad variations of 12 to 82% in the 35 studies he examined. Yet, despite these differences, the authors unanimously concluded that, where possible, the term "dropout" must be unambiguously defined and the institutional type specified.

A major limitation of the above studies, in addition to those mentioned, is that they did not present a true representation of all higher-education institutions. Feters (1977) pointed out that these

previous studies did not use a "representative probability-based sample" and ran high risks of bias. He cited the National Longitudinal Study (NLS) for the High School Class of 1972 as correcting for this bias as approximately 50% "of the sample entered over 1,800 institutions of higher education" (p. 19). As a result of this work, it was reported that after two years, 23.5% withdrew from all four-year colleges (5.28% due to academic dismissal and 18.26% were voluntary). When compared to type of institutional control, public four-year colleges lost 28.5% of all entering students after two and one-half years as compared to 22.3% for private institutions, which was found to be significant at $p = .01$ (pp. 22-24).

However, in contrast to Fetter's point about sample representativeness, it is important to note that the NLS follow-up occurred after only two years from the point of initial matriculation. Yet, as Kolstad (1977) noted, the number of students who drop out has been declining over the past 22 years. (See Table 2.1.)

How does MSU compare with these national data? To what extent are they similar or dissimilar to the above findings?

A preliminary report produced by the Office of Planning and Budget at MSU yielded the figures found in Table 2.2. This report is preliminary in that it does not take into account those students who graduated at the end of a practicum or internship experience and were not enrolled for academic credit during the term. Dr. William Rosenthal (1982), analyst, stated that this missing group of students may cause an error factor of approximately 3 to 4%. The data base is currently being updated to accommodate this finding.

Table 2.1.--National rates of attrition by research source.

Fall of College Entry	Follow-Up Period	Attrition Rate in Percent 4- Year Colleges & Universities	Source
1950	4 years	46	Iffert, 1957
1959	4 years	39	Trent & Medsker, 1968
1960	4 years	22	Bayer, 1968
1961	4 years	35	Astin & Panos, 1969
1961	10 years	21	El-Khawas & Bisconti, 1974
1966	2 years	25	Adams, 1969; Jaffe & Adams, 1969
1966	4 years	28	Astin, 1972
1966	5 years	25	El-Khawas & Bisconti, 1974
1972	2 years	23.5	Peng, Asburn, & Dunteman, 1976; NLS Study

Source: Kolstad, 1977, p. 4.

Given an adjustment of -4% to build in the missing graduates, it is still readily seen that after a six-year follow-up for the class of 1973, five-year follow-up for the class of 1974, and so forth, the rate of attrition from MSU is somewhat higher than Kolstad's (1977) observation. However, the studies presented in Table 2.1 reflect dropouts from higher education, whereas the MSU data reflect only those students who left the institution and did not necessarily drop out of higher education altogether. Recalling Eckland's (1964) finding that as many as 74% graduate from some institution, it cannot be concluded from the MSU data that 35.9% in 1973 or 38.6% in 1974 left higher education entirely. Yet it would be unlikely that a significant

Table 2.2.--Persistence/attrition of domestic MSU students (January 15, 1982).

Year	Graduated Before Fall 1982		Not Enrolled		Still Enrolled				Total	
	No.	%	No.	%	Good Standing		Academic Diff.		No.	%
					No.	%	No.	%		
1973	4,180	62.0	2,420	35.9	128	1.9	9	.1	6,737	100
1974	4,065	58.9	2,662	38.6	204	3.0	10	.1	6,901	100
1975	3,549	50.3	3,045	43.2	424	6.0	35	.5	7,053	100
1976	2,466	37.4	2,609	39.5	1,460	22.1	66	1.0	6,601	100
1977	51	.7	2,284	32.4	4,584	65.1	121	1.7	7,040	100
1978	4	.1	1,802	25.5	5,077	71.7	194	2.7	7,077	100
1979	1	.01	1,316	17.7	5,680	76.5	425	5.7	7,422	100

number of those groups transferred and graduated from another school, especially in view of national findings.

Despite the judgments and rationalizations one may choose to explain the MSU figures or those from another institution, they must be compared not only in and of themselves, but also with projected enrollment patterns. Further, with both sets of figures in mind (see Chapter I, page 3), values need to be placed on the acceptability of those data. As a context for future readers of this thesis, it is important to note that the president of MSU has chosen not to find the current figures appropriate and acceptable. As this research is being conducted, a retention task force, in addition to specialized recruiting strategies, has been commissioned by the president's office.

In conclusion, there is still a great variance in the attrition rates, depending on the size and control of the specific institution under review. Nationally, across all types of four-year colleges and universities, there is an apparent decrease in the number of students who never finish a degree in higher education. The most important data to consider are those collected by the interested institution; this should be done in conjunction with enrollment projections. Finally, it is noteworthy to recognize that leaving higher education may, in fact, be an appropriate and healthy decision for some students:

But, recent data (Astin, 1975) suggests that such students represent a small minority and that students usually leave college for negative reasons: boredom, finances, poor grades and so forth. Positive reasons, such as a good job offer, are given by less than ten percent of the dropouts. It is easier to believe that students are taking time to "find themselves" than it is to confront the limitations of institutional programs and policies. (Astin, 1977, p. 260)

Precollege Characteristics and Their
Importance for the Dropout

There is little question that the individual background characteristics of the entering college student have an effect on the student's overall chance for success. Ample evidence exists to support the finding and can easily be found in the aforementioned comprehensive literature reviews (Spady, 1970; Cope & Hannah, 1975; Tinto, 1975; Pantages & Creedon, 1978). Most recently, a study involving a series of precollege characteristics encompassing demographic, financial, academic, motivational, and socialization variables of three freshman classes "at a private liberal arts college in Kansas" showed the continuing importance of such factors. Hutchinson and Johnson (1980) used a discriminant-analysis procedure to isolate variables that separated persisters from withdrawers and academic dropouts or those students who did not re-enroll for their second year and had less than a 2.00 GPA out of a maximum 4.00. They found six variables formed a discriminant function that correctly classified 80% of the dropouts, 63.4% of the persisters, and 39.1% of the group who voluntarily withdrew for a combined figure of 63.4% who were correctly reclassified. Among the six variables, four were directly related to the category of precollege characteristics: high school GPA, father's occupational level, orientation to a vocational goal, and the high school counselor's estimate of success.

Further, as documented in the literature reviews, the scope of such characteristics is extremely broad, and new variables are added as the understanding of the college dropout becomes more clearly

focused. However, Tinto's (1975) analysis appropriately concluded that some characteristics present a greater influence on the eventual attrition/persistence of the student than others. He went on to clarify these factors as those that pertain to the family (such as socioeconomic status and income level), educational experiences before college entry (i.e., size and type of high school and evaluation of this experience), individual attributes (i.e., measures of academic aptitude, academic achievement, and sex), and expectations of college "attainments" (i.e., expected, level of college degree, academic performance, college major, and extracurricular involvement). The purpose of this section is to present the major findings of the comprehensive literature reviews and those of more recent studies to familiarize the reader with this aspect of attrition research and to provide support and focus for some of the hypotheses (notably Hypotheses 1, 2, 3, and 8) stated in Chapter I.

Individual Attributes

Sex, race, individual measured aptitude, and academic achievement are all obvious reflections of the individual. In some instances, their effect on attrition/persistence documents an obvious conclusion, whereas in others more penetrating analysis is required.

Cope and Hannah (1975) found that, for a majority of the studies, sex differences did not present significant distinctions in total attrition. This was confirmed by other comprehensive reviews. However, the rate of attrition and reasons given for leaving have differed by sex. Citing studies by Demos (1968), Nelson (1966),

Astin (1964), and Tinto (1975), Pantages and Creedon (1978) found that women tend to drop out with greater frequency than men and do so at schools that have a high ratio of men to women. Additionally, once a female student has left, the chances of her re-enrolling to complete the degree are much less than for men. Yet, more women will eventually graduate within the four-year period, while, as Astin (1972) found, more men will eventually complete their degree requirements beyond the traditional period. But as Spady (1971) found, more men tend to be dropouts for academic reasons, whereas more women tend voluntarily to withdraw. This conclusion is significantly related to the differences found among the reasons given by each sex. In a review of more than 15 studies dating to Iffert (1957), Cope and Hannah (1975) found that the differences were primarily a result of the sex roles filled by men and women. They concluded:

Intellectual-aesthetic and social orientations, which are more central to the feminine role, tend to be related to attrition for women but not for men. Feelings of adequacy and competence, more central to the masculine role, are related to attrition for men but not women. (p. 16)

Yet, such a conclusion is time bound and changes as men's and women's roles continue to evolve and more women enter the work world. Bean and Creswell (1980), studying reasons given by female dropouts at a religious coeducational, liberal arts college in a midwestern city, found that women who dropped out between their first and second years cited:

- the educational experience would not be helpful in getting a job
- they did not feel a sense of self-development
- their commitment to the institution was very low
- they had family responsibilities. (pp. 320-27)

Although the gap between dropout reasons for men and women will probably remain, it may be narrowing somewhat, especially as more women view education as a step to a successful career. Again, however, as with other attrition studies, sex differences must be considered in the context of the particular institution to provide the most meaningful analysis.

The variable of race presents similar conclusions as did sex. That is, results are not consistent over time, racial-ethnic groups differ in the reasons they give for persistence/attrition, and the results tend to reflect the prevailing social climate. For example, in 1973, Astin found no significant difference in the probability of Black, Oriental, or American Indian students' graduation rates, although they were slightly lower than majority students' rates. However, in 1977 his project group found that while the persistence rate for Black students was lower than that for Caucasian students, this largely depended on the institution. Predominantly Black institutions graduated a greater percentage of Black versus non-Black students, whereas the reverse was true for predominantly White institutions. Holding preparation and ability constant, Black women had a higher persistence rate than White women (Astin, 1975). He went on to point out that Black students are more likely to drop out for reasons of money and marriage than are Caucasian students. Further, persistence was positively related to minority students' access to nontraditional ways of demonstrating knowledge and credit by examination (Sedlacek & Webster, 1978). Again, institutional

context asserts itself as a powerful variable preventing one from making sweeping generalizations across all possible institutions.

Turning to measures of academic aptitude and achievement, it would seem logical for one to conclude that these indices are fairly strong predictors of collegiate success. But, as each of the comprehensive literature reviews is examined, this finding is only half correct.

Cope and Hannah (1975) began their review on this topic by stating that, in general, it has been found that dropouts tend to have lower achievement scores and measured aptitude than nondropouts. Further, these differences have often been found to be significant. They pointed to a study by Ivey, Peterson, and Trebbe (1966) as one of the better studies that represent the general conclusions mentioned at the beginning of this discussion. Using high school class rank, SAT scores, and some personality measures, they found "high school rank is the most effective predictor of collegiate success and the CEEB-SAT provides a significant addition to [high school rank]" (p. 202). Yet, Cope and Hannah cautioned readers of the term "statistical significance." They pointed out that with large samples significant findings usually occur with almost any difference. Thus it is important for reviewers to separate what is significant from what is substantive and apply appropriate judgment that would lead to practical and meaningful action.

— Tinto (1975) began to clarify the findings of ability, achievement, and aptitude by suggesting that the importance of their association with collegiate success is not meant to imply success

with respect to persistence. Referring to the ability to achieve in the collegiate setting, Astin (1972) found that high school GPA is a better predictor of success in the college classroom than are pre-college aptitude tests. Vaughan (1968) stated that the literature has clearly pointed to the need to separate those students who voluntarily withdraw from those who are academically dismissed. One can surmise from Vaughan's findings that measures of ability, achievement, and aptitude are more strongly related to academically dismissed dropouts than those who voluntarily withdraw.

Citing several studies, Pantages and Creedon (1978) clarified this topic by showing that the association between measures of ability, aptitude, and achievement and college persistence is erroneous: "Several studies have pointed out that although high school performance is an accurate predictor of college academic success, it does not predict persistence at the college level" (p. 63). They further supported their conclusion demonstrating that Eckland (1964) found high school class rank to be twice as powerful a predictor of which students would drop out, as opposed to the relative permanence of their dropping out. In a further study by Johansson and Rossmann (1973), who supported Vaughan's (1968) study, he found measures of scholastic aptitude to discriminate more powerfully between "voluntary dropouts" and academic dismissals. There was relatively little difference between voluntary dropouts and persisters on the variable of scholastic aptitude.

Collectively, then, the literature in this area has pointed to the importance of examining the precollege scholastic achievements

and aptitude of students with respect to signaling academic success in college and those students who are likely to drop out due to academic failure. However, while these measures have a bearing on persistence, the relationship provides minimal guidance in explaining the voluntary dropout. In fact, an interesting study conducted by Gurin, Newcomb, and Cope (1968) demonstrated that background experience, particularly related to the family, had more influence on persistence than did the variable of "academic preparation."

Family Background

Gurin, Newcomb, and Cope's (1968) research studied characteristics of entering freshmen that were associated with attrition. They constructed two scales: Cosmopolitanism and Academic Preparation. The cosmopolitanism scale contained variables such as type of hometown, size of high school, and family background. Academic preparation contained those factors reviewed in the above discussion. Spady (1970) examined this study and found that when both scales were concurrently controlled, cosmopolitanism showed a stronger relationship to persistence than, as noted above, academic-preparation variables. He wrote:

The basic implication of their finding is somewhat contrary to what some researchers might expect to emerge from a set of variables such as this, for . . . the advantages thought to accrue to individuals with particular kinds of attitudes do not exist independently of their family background.
(pp. 69-70)

Many factors can comprise the category of family background, not all of which bear a strong association with attrition/persistence. Items such as socioeconomic status, parental education, family income,

racial background (already discussed), family relationships, and parental expectations would seem appropriate for this discussion.

Although a number of studies have investigated the effects of socioeconomic status and family income, Summerskill (1962) pointed out that the results have not been consistent. Citing an early study by Pearlman (1952), who controlled for scholastic aptitude and high school performance, he found that there were no significant differences between dropouts and persisters with respect to parental occupation, income, and other related variables. However, investigating another study by Farnsworth (1955), Summerskill pointed out the importance of the family's cultural and educational values as they relate to persistence. That is, in families in which education and higher learning are valued, in which intellectual matters are openly discussed, and family relationships are open and supportive, students tend to be more successful and to have a higher rate of graduation from college.

Pantages and Creedon (1978) supported Summerskill's earlier findings examining a number of studies that investigated socioeconomic status, parents' education, family income, and social status. The most important association they found between these variables and persistence was from research by Astin (1973) and Eckland (1965). The results were that these factors did not have a direct relationship to the process of dropping out; however, they were significantly related to which students were more likely to return after dropping

out. Therefore, the overwhelming conclusion was that socioeconomic-status factors hold minimal value for predicting attrition.

Yet, while socioeconomic-status variables are not strongly related to attrition and persistence, the natures of family values, relationships, and educational expectations are. Spady (1970) briefly reviewed five studies that supported these other aspects of family background:

- Congdon (1964): more successful college students characterized their families as open, accepting and had a positive relationship with their parents.
- Jones (1955) and Weigand (1957): students who were poor achievers described their families as being overprotective, more demanding, and having increased tension and disturbance as opposed to the families of higher achieving students.
- Hood (1957): students who were dropouts reported that they were not certain of their parents' support for their educational pursuits and were less likely to openly confront issues on which they would tend to disagree.
- Trent and Riegle (1965): students who were graduates said they turned to their parents for advice, were praised by them and felt a strong interest from them toward their educational degree. This finding was significantly different from those who dropped out. (p. 70)

It is easily seen that the quality of relationships between a student and his/her family, including the expectations that parents hold for their students' education, is a very strong influence on persistence. However, it is important to look beyond simply acknowledging this influence and to examine its manifestation--commitment.

In a study involving 1,407 students and 1,331 parents at three midwestern liberal arts colleges, Hackman and Dysinger (1970) investigated commitment to college on the part of the students and the influence of parental expectations on degree of commitment. Their study was very carefully conducted as they examined the differences

between persisters, transfers, and returnees, academic dismissals, and voluntary withdrawals. Appropriate to this discussion, parental expectations were found to be significantly higher for persisting students compared to all other groups. This influence was found to be most different with those students who voluntarily withdrew:

The results suggest that a student's home and family may be highly important in determining his reaction to the college experience. . . . In addition, the more parents indicate that they believe the student will perform well in college, the stronger the measured commitment. Finally, when students or parents indicate that "it has always been expected" that the student would attend college, commitment tends to be higher. . . . The present results leave little doubt that the parents' own commitment to their child's college education is significant in understanding who persists and who does not. (p. 320)

To summarize these various studies, socioeconomic factors and social status bore only a weak relationship to persistence. A majority of these articles pointed to persisting students as coming from more affluent homes with better educated parents, yet some other significant studies failed to replicate this claim. Upon further investigation, it was seen that persistence was not so much related to what the family is, but how it acts in relation to one another. A strongly supportive family may be characterized as one that is genuinely interested in the future of its members and holds high expectations for their success--a finding that may not only positively influence persistence in college but in other settings as well.

Educational Experiences Before College Entry

Aspects of this subject have already been covered in the discussion of academic preparation as reflected by high school GPA,

class rank, and scholastic aptitude. However, it is important to review the effect of high school size and type--that is, public or private.

Summerskill (1962) cited studies by Thompson (1953) and Suddarth (1957) and suggested that graduates from larger high schools are more likely to persist in college than are those from smaller high schools. Yet he clearly stated that these findings were not conclusive and that he was unable to explain the results with any certainty. Pantages and Creedon (1978) reviewed the work of Sexton (1965), who supported the previous finding but went on to point out research showing that only the very small high schools (under 79 students) had higher attrition rates. Interestingly, Cope (1972) found a connection between college size and high school size, suggesting that a "breakeven point" may exist: Those students who came from smaller high schools had better persistence rates if they attended small colleges, and vice versa. He went on to explain these results by saying that the "fit" between the student and the school is the crucial linkage.

A more recent study by Downey (1978) investigated the differences between entering freshmen from different-sized high schools who attended Kansas State University. Using the American College Testing Program data to equate students and stratify them according to high school size, he investigated first-semester grades, level of extracurricular involvement, and persistence. The results of his study showed that although students from various-sized high schools differed, the majority of the differences were in nonacademic school accomplishments.

Students from smaller high schools were more frequently involved with nonclassroom activities than were students from larger high schools. There was only minimal information that suggested students from smaller high schools were not performing as well academically and that these same students showed a "lower rate of persistence after three completed semesters" (p. 355). Therefore, the major conclusion was that there was virtually no relationship between attrition/persistence and high school size, with the exception of very small high schools.

Unfortunately, the literature describing the type of high school (public or private) and its effect on persistence was not any more helpful than the review pertaining to size. For example, conflicting findings existed between Sexton (1965) and Astin (1973). Sexton, summarizing from earlier work, stated that the results pointed to public rather than private school students having higher persistence rates. And, with a limited rationale to support her hypothesis, she suggested that students in public schools had higher levels of achievement needs. An opposing view by Astin (1973) found the exact opposite in his research and stated that the academic standards of private schools are higher and therefore offer better preparation for the rigors of college studies. Despite these findings, size and type may not be the important factors that deserve attention. Rather, other elements such as curriculum, facilities, quality of the faculty, high school student resource services, and community support appear to be the primary influences in the quality of a student's preparation. In fact, Spady (1970) located four studies in which dropouts

cited poor preparation on the part of their secondary schools, attributing this to some of the variables just mentioned. Further, Dyer (1968) studied the effects of high school preparation on persistence and concluded that characteristics relating to the quality of facilities, faculties, and so on, affect educational attainment and consequently persistence. It may be that all too often educators ignore the obvious and dismiss criticisms by former graduates who dropped out of college as rationalizations for their own lack of motivation and ability to learn. It is much easier to discount the comments of "disgruntled students" than it is to confront the limitations of one's institutional program and facilities.

Expectations of the Collegiate Experience

It has already been pointed out that expectations, particularly from one's family, play an important role in the success and persistence of the student. Hackman and Dysinger (1970), in the same article, went on to show that the expectations that the student has of him/herself are no less important. Mean scores from items such as "Highest Level of Education Planned" and "Plans to Continue at the Present College" were higher for persisters than for any other category of nonreturning student and most different from the group, "voluntary withdrawals" (p. 316).

Other studies have strongly supported this finding. Spady (1970) stated that it is probably one of the most unambiguous findings that the literature supports as being associated with persistence. He cited the work of Sewell and Shah (1967), Trent and

Medsker (1968), and Astin (1964), pointing out that these studies showed that persisters had (1) more definite educational plans, (2) had intentions of graduate or professional school more frequently, and (3) generally saw the importance of college more readily than nonreturning students. Additionally, work by Astin (1973) and Rossman and Kirk (1970) added further support to these results by showing that those students who do not expect to graduate have lower graduation rates as compared to those who expect to graduate. Rossman and Kirk (1970) suggested that these students have a tendency to create situations in which they can't succeed and, in fact, promote their own self-defeating behavior to the extent of it becoming a self-fulfilling prophecy. Finally, as Fetters (1977) demonstrated, even after controlling for socioeconomic background and high school GPA, students with low aspiration had higher withdrawal rates than those with higher levels of aspiration in college.

If a student's expectations and their strong relationship to persistence and attrition are one of the more "unambiguous" findings of past research, they are also one of the most persistent over time. Wessell, Engle, and Smidchens (1978) showed marked differences between the persistence and withdrawal rates of 2,438 freshmen at a four-year midwestern college, based on expectations they held for studying a particular major or being undecided. Those students who did not have any expected direction of study tended to withdraw with greater frequency than those students who did. This finding held true even for students who transferred. Hutchinson and Johnson (1980) also found that the expectations one held for a particular vocational

goal successfully discriminated between persisters, academic drop-outs, and voluntary withdrawers. Persisters were more likely than the other groups to aspire to a particular goal. These conclusions began to bring to the surface an issue related to expectations--that is, the degree of decidedness and certainty one holds for an academic major and career goals. In a study of 767 students at an urban, public commuter college, Muskat (1979) found significant differences between returning and nonreturning students where persisters were more likely to have decided on a course of study and felt a high degree of certainty about the decision and decided on career goals feeling equally certain.

Tinto (1975) would argue that measuring one's expectations and/or plans as well as the certainty felt toward those plans is actually a measure of commitment. In his model (presented later in this chapter), he made the point that commitment is placed after family background, individual attributes, and previous educational experiences: "It is suggested that one's commitments are themselves a reflection of a multidimensional process of interactions between the individual, his family, and his prior experiences in schooling" (p. 103). More important not only to his model but also an observation of the literature, Tinto concluded that commitment is the single most important variable determining college completion.

Precollege Characteristics in Retrospect

The past several pages presented studies and conclusions of precollege factors associated with the college dropout. While raising

many interesting questions and suggesting various notions about why such variables may be significant, they lacked a comprehensive framework within which to explain the findings. Summary statements by Spady (1970), Tinto (1975), and Cope and Hannah (1975) agreed that the literature in this aspect of studying attrition/persistence is "conceptually incoherent and methodologically uneven" (Terenzini & Pascarella, 1978, p. 349). As will be seen in the next section of this chapter, the study of the college dropout has begun to move beyond this stage into more advanced and potentially beneficial understandings of why some students return to college, eventually graduating, and others do not.

Attrition: Toward a Formulation of Theory

Although a majority of the research on attrition consisted of defining individual and institutional characteristics associated with dropping out, the focus began to shift in the early 1960s. At that time, a more interactive way of viewing the dropout phenomenon caused researchers to conclude that both the student and the collegiate environment played a role in the process. Neither the student nor the institution was seen as the primary contributor to attrition and/or persistence. Some of the studies that explored this approach were conducted by Keniston and Helmreich (1965), Pervin and Rubin (1967), Nasatir (1969), and Rootman (1972). As will be seen, these studies brought the hypothesis of "student-college fit" into clear view.

As reported by Cope and Hannah (1975), Keniston and Helmreich (1965) explored the concept of congruence between the individual and

his/her environment. Specifically concerned with the identity development of students, they found that the degree of identity development was positively related to the amount of congruence the individual felt within the environment (Cope & Hannah, 1975). That is, the more compatible the college environment is with the individual student's beliefs, values, and aspirations, the more congruence exists, and this facilitates individual-identity formation. This belief was very similar to a contemporary of the researchers who developed the theory of cognitive dissonance. Festinger (1957) stated that two cognitions held by the individual are said to be dissonant when they are not in a logical relationship to each other or are incompatible with the person's current experience. Festinger went on to note that the dissonance was "drive-like," and the resulting tension was unpleasant, causing the person to do something to reduce the tension (Jones & Gerard, 1967). In view of the current subject, in order for greater identity development to occur and the tension to be reduced, the student may seek a new environment, obviously resulting in dropping out of the present institution.

Pervin and Rubin (1967) undertook a study at Princeton University that followed from Keniston and Helmreich's work. They hypothesized that a lack of "fit" between the students and the characteristics of the college created dissatisfaction within the student. As the differences between the way the student viewed him/herself and the image held of the college grew, dissatisfaction eventually increased, leading to the point of dropping out. They also stated that differences between the self and the college were more associated

with nonacademic reasons than academic ones but did not support this statement with any rationale. Regardless, the data from their study supported the belief that the degree of discrepancy between the student's view of self and of the college was positively related to the probability of dropping out. They did find some evidence to support the idea that dissatisfaction was also related to the academic arena, yet, as noted above, a majority of their findings reinforced the hypothesis that the discrepancies were related to nonacademic reasons:

These data indicated that the main source of variance was in the way students perceived the college. . . . Those in the high discrepancy and high dissatisfaction group rated the college as higher on the following items: dull, bored, uncreative, competitive, tense, ritualistic, conventional, conservative, Republican, status-oriented, militaristic, repressive, conforming, coercive, detached, snobbish, cold, callous, unfriendly, and intolerant. (p. 293)

However, the researchers cautioned that their study did not take individual-student differences into account. They suggested that future research distinguish between the unique characteristics of the individual and the context of the environments they perceive.

Concurrent with the work of Pervin and Rubin, Nasatir (1969) researched individual student differences and how they interacted with living environments on the campus. Apparently following the previous work of the congruence model, he explored the recommendations of Pervin and Rubin (1967) and conducted one of the more systematic studies at that time. His research involved the administration of a series of psychological tests and attitude questionnaires to entering students at the University of California, Berkeley. His

intention was to determine which groups of students were primarily "academically oriented" or "socially oriented." The academically oriented students were defined as those students who felt "the most important reason for attending college is to obtain a basic general education and appreciation of ideas," whereas nonacademically oriented students viewed "the development of the ability to get along with people, prepare for marriage" as the most important reason (p. 293). In a similar analysis of following where these students resided, Nasatir classified residence halls as either academic or nonacademic. With these categories of living situations and individuals, the student dropout rate was measured. As might be expected, some of the results tended to confirm common-sense reasoning, yet one raised an interesting issue:

- The dropout rate was higher in "non-academic" residence halls compared to "academic" residence halls.
- The dropout rate for non-academic students was higher than for academically oriented students.
- Academically oriented students had higher dropout rates in non-academic living environments than in academically classified residence halls.
- The dropout rate for students who held a non-academic orientation was twice as high as the academically oriented students in non-academic settings.
- HOWEVER--
- The dropout rate for non-academically oriented students in non-academic settings was still lower than their rate of dropout in academic settings. (p. 297)

This last finding raises a new concept from Nasatir's results and for subsequent research--that is, integration. This finding points to the importance of congruence in terms of its logical outcome. The concept of integration implies the positive effect of bringing the environment and the student into a harmonious relationship.

Nasatir pointed this out by stating that while an academically oriented student may not find support for his/her point of view in the nonacademic living situation, he/she is nonetheless supported by the "intellectual activities from the university culture at large. . . . Without an academic orientation, and without a supportive context, students manifest a high rate of failure" (p. 296). The same holds true for nonacademically oriented students, who have lower attrition rates in nonacademic environments than they do in academic environments.

In 1972, Rootman wrote Voluntary Withdrawal From a Total Adult Socializing Organization. With Nasatir's results in mind, he studied the effect that integration had on the retention of first-year students at the U.S. Coast Guard Academy. He proposed that the environment presents various expectations on the "role" of the cadet, and these interact with the individual's personality, needs, and goals. When a conflict occurs between what is expected and the person's interpersonal domain, stress results, eventually leading to "strain." Beyond a certain point (depending on the individual), the cadet begins to look for coping mechanisms to increase the "fit" between the person and the role. In some cases, the chosen mechanism is withdrawal, thus exercising control over the environmental expectations by changing the setting.

Rootman found support for his hypothesis when such variables as personality, actual and perceived attachment to persons in the academy, interests, and values were all significantly related to withdrawal: "Whether or not a person will survive in a military

academy for a year appears to be largely a function of the degree to which his own properties 'fit' the role of the cadet at entry and the degree to which he 'fits' the group with which he is socialized" (p. 266). One of the major contributions of this research is found in the preceding statement. That is, the student must not only fit the structural environment as demanded by the institution, but also the social-interpersonal environment as found within the students, faculty, and staff. As seen in Nasatir's work, both environments must be taken into consideration as each has its separate influences that can help support or alienate the student. A clearer definition of the differential effects will become apparent in the subsequent research review. Nevertheless, to become socialized in an institutional setting, according to Rootman, appears very similar to what Nasatir (1969) referred to as integration and what Pervin and Rubin (1967) referred to as congruence.

The theory of person-role "fit" and integration permeates a great deal of the literature on why students leave a particular institutional setting or higher education altogether. Other studies by Pace (1962), Stern (1960), Astin (1964, 1965), and others have strongly supported the notion that attrition research must approach the phenomenon by observing the interaction of the student and the environment. Their findings have consistently corroborated results that found persistence positively correlated with integration. Even without the explanatory backdrops of congruence and "student-environment fit," this finding has endured. In 1975, a nationwide attrition study of 41,000 undergraduate students at 358 two- and

four-year institutions was conducted by Astin. Although he did not attempt to present a theoretical framework within which to explain his findings, he concluded:

After examining the fit between the student and institution, it appears that in general, persistence is enhanced if the student attends an institution in which the social backgrounds of other students resemble his or her own social background. Such interactions are most apparent with the town size, religion, and race of the student. (pp. 144-45)

As noted above, although Astin did not presuppose any explanation for his findings (bringing them together into a coherent relationship), previous literature did offer some interpretations. That is, student and institutional characteristics interact, leading to varying levels of congruence or dissonance. As will be seen in subsequent research, the students develop certain expectations about what is an acceptable or unacceptable level of integration; if the desired (expected) level of integration is not achieved, the student may choose to withdraw.

In 1970, a significant new direction in the study of attrition was undertaken by Spady. Noting what he referred to as a lack of theoretical and empirical coherence in the literature, he developed the first interdisciplinary model of the dropout phenomenon. The model was based on the sociological contributions of Durkheim's studies of suicide, as well as the research on attrition that had been conducted up to that time. While Durkheim discussed and described many specific types of suicide, he noted that "integration" was an important causal factor in many of the suicides. He found that as a person began to withdraw from society, the chances for suicide increased. Further,

of those who committed suicide, many could be described as having very little social contact or few social connections. Yet, social affiliation as observed by Durkheim was only one level of integration. He also noted that a lack of "normative congruence" limited the degree to which an individual became integrated into the social environment--that is, agreement between individual beliefs, values, and attitudes and those held by society. With these observations and research, he wrote:

The individual alone is not a sufficient end for his activity. He is too little. . . . There is in short, in a cohesive and animated society a constant interchange of ideas and feelings from all to each and each to all, something like a mutual moral support, which instead of throwing the individual on his own resources, leads him to share in the collective energy and supports his own when exhausted. (E. Durkheim, 1951 p. 210)

Spady (1970) was quick to point out that suicide and dropping out of higher education are far apart in terms of the severity of their consequences. Yet his intention was to show that the conditions surrounding each experience are very similar. That is, the degree to which the individual becomes integrated with the "society" or institution in higher education in each experience is a key variable. Further, the factor of integration occurs on two levels: socially (affiliation) and cognitively (normative congruence).

Therefore, according to Spady, dropping out is to be viewed as a process involving input variables brought to the situation by the student and process variables presented by the existing collegiate environment. He stated that the collegiate setting provides opportunities for reward. In turn, the rewards gained by the students are

indirect measures of the amount of integration achieved in the experience. Therefore, the individual brings to the environment both academic aptitude and a particular set of attitudes, values, and beliefs (as a function of family background). The collegiate environment presents opportunities for the student to become integrated in the setting through classroom experiences, academic assignments, support services, and other peers. As a result of the interactions between the student and the environment, rewards may or may not be found (Spady, 1970). Academically, the rewards that can be obtained through classroom interactions are grades and the student's own intellectual development. Socially, the student may experience varying levels of friendship support and consistency in values, attitudes, and beliefs. While the degree of normative congruence is a reward having a direct bearing on social integration, lack of congruence on an institutional level may be without consequence. That is, while the student may find the general philosophy of the institution to be at variance from his/her own, they may have found a particular faculty or department that supports their ideas and opinions in spite of the larger system (Spady, 1970). Yet, insufficient grade performance can also limit any amount of integration achieved if the student is involuntarily dismissed. "In my view, then, full integration into the . . . life of the college depends on successfully meeting the demands of both its social and academic systems" (Spady, 1971, p. 39).

After developing this model, Spady went on to test it using the data collected from the 1965 entering-freshman class at the University of Chicago. He collected precollege information, including

family background, high school experiences, and expectations of college. After those students began their spring semester, a second questionnaire was administered to gather perceptions of the environmental influences, friendships, satisfaction with courses, and so on. After a four and one-half year period passed, it was determined that 38% of the students had not completed their degree and were labeled "dropout." Using multiple-regression analysis, the major findings of this study were:

1. Significant differences in the interaction patterns between men and women were found to influence eventual persistence/attrition decisions.

2. Collegiate expectations, family background, and high school performance were influences but not primary determinants of interactions that occurred on the campus.

3. Intellectual development (stimulation in course work, expansion of cultural and intellectual outlooks, critical thinking, self-evaluation of academic performance) varies more with nonclassroom faculty contact than peer interactions and is seemingly unrelated to high school performance.

4. Intellectual development was found to be greatest for those who are predisposed to learning and have not had such experiences due to poorly equipped high schools or small community settings.

5. Yet, grade performance is strongly related to the academic quality of the high school, academic performance in high school, and measured math and verbal ability.

6. Interpersonal contacts, though strongly related to social integration, tended to reduce high academic achievement. Spady stated that this is probably due to the extremely competitive and demanding academic climate of the school as well as the nature of the student selected.

7. Only indirectly influenced by entering characteristics, satisfaction is reached in the early months of the freshman-year experience as a direct function of academic, intellectual, and social interactions.

8. Institutional commitment is formed much earlier in the educational experience than was originally hypothesized. However, the level of commitment does change over time as a function of the experiences on the campus.

9. Dropout decisions for women are heavily dependent on commitment to the college formed by the fulfillment of interpersonal needs. Academic-related variables run second to this during the freshman year.

10. Dropout decisions for men are primarily based on grade performance and are only supported by a lack of social integration and institutional commitment. "What counts most is their ability to meet the formal performance standards of the faculty, irrespective of the more intrinsically based social and intellectual factors" (Spady, 1971, p. 61).

11. Those students who eventually graduate differ from early dropouts most dramatically on initial-year academic performance more than any other factor. Further, in the second, third, and fourth

years, the sex differences tend to diminish, with women becoming more academically oriented than their first-year counterparts (pp. 57-62).

The fact that Spady conducted his study in the mid-1960s is very evident in his findings. The cultural role of men and women tends to be readily apparent and shows a definite relationship to dropout and/or persistence decisions. Thus the need continually to update research in this area becomes very clear. Regardless, Spady did make a major contribution to the understanding of the dropout process by bringing together much of the literature at that time. Further, he created a significant foundation and stimulus on which to base future research.

One of the most notable efforts prompted by Spady's work was that of Vincent Tinto. As will be recalled, Chapter I highlighted Tinto's 1975 model and presented it as providing the theoretical framework for this current investigation. Before a more complete description of the model, a number of factors should be considered.

Upon initial review, it becomes apparent that the model fulfills many of the conditions embodied in a strict definition of theory. That is, the model (a) seeks to describe a phenomenon, (b) attempts to provide an understanding of previously unexplained events, (c) more clearly organizes and interrelates previous knowledge, and (d) allows for more efficient research (Reynolds, 1975). The final condition, assisting with the prediction of future events, is finding support through follow-up research of Baumgart and Johnstone (1977) and Pascarella and Terenzini (1980). However, the research is not yet conclusive. A second and major reason for

choosing this model is that it allows the examination of institutional contributions to the attrition phenomenon. That is, while the model seeks to explain the process of completely dropping out of higher education, it more clearly focuses on why students leave a particular institution (the major intention of this study). A third reason for selecting Tinto's model is that it is clear, concise, and easy to follow. The framework is designed with a solid basis in research, and the concepts are clearly delineated in its components. And finally, as noted above, initial research has begun to validate the major tenets of the model and supports its value for application to other institutions in higher education.

Although the design of the model differs from Spady's (1970), there are important similarities. Both systems use Durkheim's theories of suicide as a basis for construction. Also, using the concept of integration, both models state that this outcome will depend not only on the educational environment but also on the background characteristics of the student. Tinto (1975), as noted earlier, categorized these factors into family background, precollege schooling, individual attributes, and collegiate expectations (manifested in levels of commitment). Further, both models refer to the collegiate environment as being composed primarily of two subsystems: academic and social. However, the Tinto model explores the differential effects of each dimension more carefully. He stated that as integration into each area has a different effect on the individual and is therefore complimentary to the other, a careful balance must be maintained. Too much integration and involvement in one area

may have deleterious effects on the student. As an example, a student who is primarily committed to academic pursuits may do so at the expense of developing an ability to form mature social relationships. Viewed from the values and assumptions of the educational-developmental theorists, such a pattern prevents the realization of the student's fullest potential (Knefelkamp, Widick, Parker et al., 1978).

While the above similarities are to be noted, important distinctions separate the two models contributing to the superiority of Tinto's framework. First, Spady's model clearly emphasizes the role of social integration, but, as Tinto explained, both social and academic integration must be carefully examined, especially in view of their different effects. Second, a major distinction can be found in the role that individual commitment plays. Spady stated that persistence or attrition is associated with rewards that a student finds in the collegiate environment. Tinto emphasized that alterations of levels of commitment both to the college and the academic degree lead to dropout decisions. Tinto (1975) stated, similar to Trent and Medsker (1968), that the student's precollege characteristics influence the formation of initial commitments to (a) obtaining a college degree and (b) attending a particular institution.

Commitment and its effect on persistence and attrition were clearly demonstrated by Hackman and Dysinger (1970). As will be recalled, the major findings of their study showed that levels of commitment formed by students before their freshman-year enrollment significantly determined their group (persisters to academic dismissals) membership the following year.

However, Tinto (1975) extended the above findings by stating that the degree and quality of interactions that a student has once he/she has enrolled on the campus and over time (both socially and academically) determine the amount of integration achieved and ultimately alter both types of commitment leading to eventual graduation or dropout:

Given individual characteristics, prior experiences, and commitments, the model argues that it is the individual's integration into the academic and social systems of the college that most directly relates to his continuance in that college . . . [and] . . . given prior levels of goal and institutional commitment, it is the person's normative and structural integration into the academic and social system that led to new levels of commitment. . . . The higher the degree of integration of the individual into the college system, the greater will be his commitment to the specific institution and to the goal of college completion. (p. 96)

Tinto also argued that forms of dropout behavior can be explained by this alteration of commitments. For example, students who transfer may have experienced low institutional commitment but higher levels of goal commitment. Students who exhibit relatively low goal commitment but are experiencing high levels of institutional integration may explain why some students stay in a particular college and continually just "get by." Also, despite a certain amount of social integration, low commitment to obtaining the college degree may result in voluntarily dropping out from higher education altogether. Finally, Tinto argued that relatively low levels of both types of integration and commitment can lead not only to voluntary withdrawal but, in most cases, to academic dismissal.

The longitudinal model proposed by Tinto can be found in Figure 2.1.

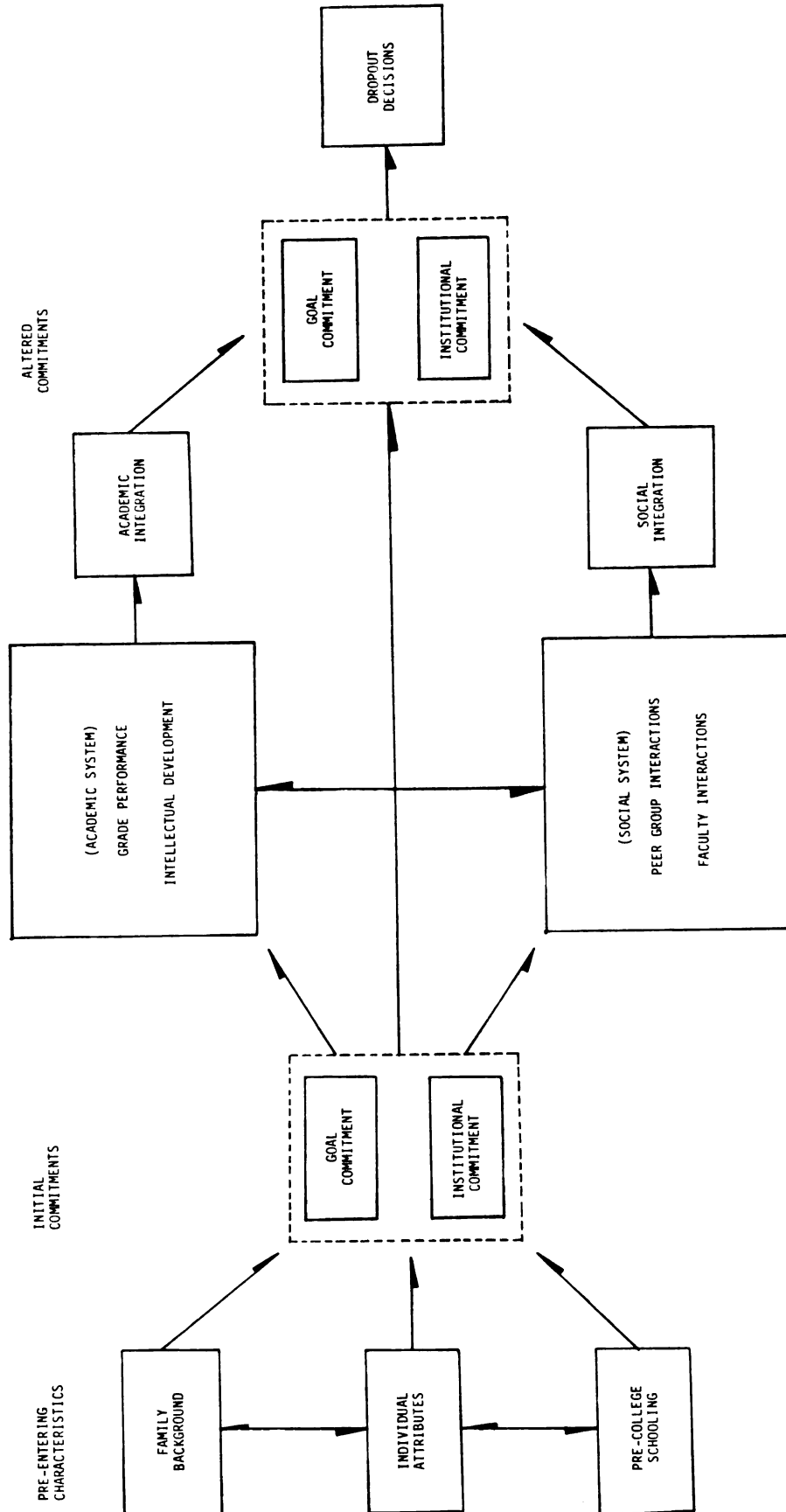


Figure 2.1.--A conceptual model for dropout from college. (From Tinto, 1975.)

Unfortunately, Tinto did not specify the instruments or "best method" with which to measure the components of his model. Rather, this was left to the judgment of the researcher and the quality of various measurement instruments. Although this has not discouraged research on the model, it has caused some investigators to note that "the variables used in [a] study probably only begin to reflect the complexity of the model's major constructs" (Terenzini & Pascarella, 1978, p. 349). Yet this limitation of Tinto's work is also an opportunity to explore and examine new procedures and instruments designed to better quantify the many factors of the model.

A few investigators have taken the opportunity to test the conceptual validity of the model with the hope of better understanding their own institutional attrition. Baumgart and Johnstone (1977) studied 444 freshman students in an Australian university across one year. They separated the students by sex and participation rate (full or part time) into returning students after one year, academically dismissed, and voluntary dropouts. They found that more full-time men who were persisters had the following characteristics:

- their pre-entering characteristics reflected higher secondary school GPA's, and greater certainty about wanting to obtain a college degree.
- further, these same students attained higher levels of social and academic integration into the university than any of the other groups of full-time men (academic dismissals or voluntary dropouts).

Interestingly, they also found that voluntary dropouts, compared to those students who were academically dismissed, had lower goal commitment at entry, lower institutional commitment, and fewer close friends within the college. Additionally, when reviewing the

data for part-time men, it was found that persisters demonstrated more academic integration than the other groups within this category. Further, while academically dismissed students tended to have lower entering high school GPA's when compared to voluntary dropouts, they were more certain of their career goals and had more friends on campus.

The results pertaining to full-time females tended to contradict what one might expect from the previous discussion on the sex-related differences of dropout factors. Persisters were found not only to have higher levels of institutional commitment, but also reported higher levels of academic integration. The degree of social integration did not differentiate the groups. Despite this finding, it is important to point out that persisters were most similar to voluntary withdrawals after one year and least similar to within-term withdrawals or academically dismissed students. Also, the various groups of part-time females could not be separated on the variables measured in this study. The researchers attributed these latter findings to a small N in the study and lack of instrument sensitivity to measure potentially discriminating variables among the women.

Using path analysis, Munro (1981) conducted a further study of the data obtained from the 1972 National Longitudinal Study of 6,018 students. She compared her results to the tenets of Tinto's model in an attempt to explain the findings. The major conclusions of the work were:

- Pre-college characteristics predicted college integration and only indirectly affected dropout decision.
- Supporting Peng et al. (1977), high school performance was a better predictor of college academic performance than aptitude measurements.
- Perceived parental aspirations had the strongest direct effect on the student's educational expectations (supports Hackman & Dysinger, 1970), and
- Educational expectations were the most powerful predictors of the educational goal to which the student was committed.
- Factors related to academic integration were more important relative to dropout decisions than social integration, and
- Goal commitment had the strongest positive effect on the decision to remain in school. (pp. 133-41)

Munro's findings contradicted Tinto's (1975) model in a few ways. As will be recalled, Tinto stated that social and academic integration have an equal influence on persistence, but Munro found that academic integration was more important than social integration. Further, unlike Tinto, who stated that academic integration supports one's goal commitment and social integration supports institutional commitment, the Munro analysis showed that academic integration has a stronger influence on institutional commitment than social integration. This result was very similar to Dye (1968) and Spady (1970), who suggested that a student's evaluation of his/her high school experience rests more on the quality of the faculty and facilities than on the social aspects of the school. Additionally, Munro's results showed that the student's educational expectations were a stronger factor than academic integration in affecting the strength of goal commitment. While this finding supported research mentioned earlier in this chapter (Rossman & Kirk, 1970; Astin, 1973; Wessell et al., 1968; Muskat, 1979; Hutchinson & Johnson, 1980), it also showed the persistent effects of educational expectations over time

and in different settings. For these students, one would expect that parental support for the educational aspirations at entry would also remain consistent over time.

Despite the above-mentioned differences, Munro's conclusions supported Tinto's argument that goal commitment has the strongest effects on persistence. Also, it was shown that Tinto's conceptualization of precollege characteristics having their greatest effect on integration into the college social and academic areas was correct (Munro, 1981, pp. 140-41).

Perhaps two of the most frequently published researchers who have used the Tinto model were Terenzini and Pascarella. Dating to 1977, they conducted a series of six studies at Syracuse University in New York. Testing the conceptual validity of the overall model in four of the studies, their research was primarily longitudinal in design. Using data from three successive freshman classes beginning in 1974, they found:

- Background characteristics did not reliably separate voluntary leavers and stayers.
- But, pre-college variables do influence the type of interactions that occur once the student has enrolled.
- Both social and academic integration made significant contributions in explaining the variance of group membership between voluntary stayers and leavers even after pre-college variables had been controlled [this contradicts Munro's 1981 finding].
- It was found that each type of integration was related to retention even after the other type had been controlled.
- Analyzed by sex [and consistent with studies cited earlier in this chapter], academic integration was more important for men, while social integration tended to be more important for women.
- Testing for interactions between pre-college background characteristics and social and academic integration, the "interaction sets" significantly contributed to variance in explaining group membership between voluntary withdrawals and returning students.

- Consistent across all six studies, the student's interaction with faculty on an informal basis outside of the classroom was either the most or second most important variable with respect to group membership. (pp. 271-82)

There tended to be more support for the Tinto model in Terenzini and Pascarella's research than found in Munro's (1981) study. Despite this difference, there was consistency with respect to the influence of precollege characteristics on the degree of integration achieved and the effects of the two types of integration on eventual dropout decisions. Moreover, Terenzini and Pascarella pointed out that the same institution can have a different effect, depending on the individual student:

The evidence is consistent, however, in indicating that although student's background or other pre-college characteristics may not, in themselves, be closely related to attrition, the influence of various forms of social and academic integration is not independent of the characteristics students bring with them to college. (p. 279)

The researchers also demonstrated that both social and academic integration contributed to attrition/persistence decisions, independent of the other when statistically controlled. This recalls Tinto's (1975) argument that each type influences dropout decisions and that a lack of or too much involvement in one or the other domain can have differential consequences. Interestingly, the findings supported the sex differences in the same pattern as earlier research (Cope & Hannah, 1975). However, with a greater percentage of women committed to a work career outside of the home entering fields such as engineering and business, it would be interesting to discover a similar result from a more recent population. Finally, informal faculty contact outside of the classroom was shown to be a very

powerful determinant in the decision process of staying or leaving. Tinto would argue that this type of contact promotes social integration leading to increased chances of persistence through strong institutional commitment. However, it may well be that this type of contact also influences academic integration as the faculty member models scholarly behavior and continues to "instruct" beyond the classroom setting (McKeachie, 1978). Such role modeling may also have a more significant effect on goals than Tinto originally hypothesized.

It is important to point out that despite the differences among the researchers, it was noted that the usefulness of Tinto's (1975) model is still current. The separate findings are suggestive of differences due to the characteristics of the sample, characteristics of the institution, and the sophistication of the measuring instruments. Thus, the recurring theme that attrition research has its most accurate and significant effect on the institution and population it studied. According to Terenzini (1980), "these reviews and various national studies, although useful for a general understanding of the attrition phenomenon, in no way obviate the need for 'local' research" (p. 257). Further, it is only through "local" research that institutional policies and practices can be examined in relation to their individual and collective contributions to retention and attrition.

Summary of Chapter II

The intention of this chapter was to familiarize the reader with the major findings of attrition/persistence research so that a backdrop could be established for the current study. In addition, the findings presented in the preceding pages provided support and rationale for the research hypotheses stated in the first chapter. With these purposes in mind, three sections were presented.

The first section discussed studies of national attrition rates and provided a comparison with the institution chosen for this research. Michigan State University had a slightly higher nonreturning rate than a series of studies cited by Kolstad (1977). Although on a national level there appears to be a downward trend in attrition over the last 22 years, national-trend data tend to mask the great variance in nonparticipation rates among specific institutions. Data from Summerskill (1962) still seem relevant in that he found the variance among specific schools to be significant. Therefore, the need to conduct an individual institutional analysis is critical for the most meaningful understanding of the information.

The second section focused on the plethora of precollege-characteristic studies. While found to be important and critical for a more complete understanding of the attrition phenomenon, they proved to be only indirectly related to eventual dropout decisions. Comprehensive reviews by Spady (1970), Cope and Hannah (1975), Tinto (1975), and Pantages and Creedon (1978) were presented with studies conducted between 1978 and 1981. It became readily apparent that pre-entering characteristics influence the nature of interactions on

the campus once the student has enrolled. That is, different students will manage their experiences differently, depending on their background. Differences due to sex, ethnic/racial background, quality of high school program, academic achievement, academic aptitude, and parental and personal expectations about college were all shown to support this conclusion. However, sufficient difference between studies were shown to exist and were attributed to the effect of specific institutional and student contexts. It was also discussed that the wide variety of studies did not lend themselves to an easy synthesis of meaning. Further, they lacked an understanding of the student-institutional interactions that occur after enrollment, providing a more influential effect on the phenomenon of dropout. Recalling the findings of Trent and Medsker (1968), Spady (1971), and Tinto (1975), precollege characteristics have more to do with the decision to go to college and what to study than they do with actual persistence or attrition.

The last section reviewed literature that began to fill the gap of understanding the student-environment interactions. Studies were presented that underlined the importance of this subject and could also be viewed as a foundation on which Tinto eventually built his 1975 model. The recurring point was that a student's experiences on the campus, particularly during the freshman year, are more important to persistence decisions than the combination of prematriculation variables. Further, as presented through the review of Spady's (1970) and Tinto's (1975) models, the college environment can be subdivided into social and academic dimensions, each contributing a different

type of influence. The Tinto model was presented to explain further the differential effects of these dimensions, especially as they relate to the level and quality of involvement/integration in the collegiate setting. It was Tinto's thesis that academic and social integration sufficiently alters initial commitments made to a degree and/or institution, leading to decisions to remain in school, to transfer, or to drop out. Although limited in number, follow-up studies to Tinto's work were presented. While there were differences among the researchers' findings, they essentially supported the concepts and propositions of the model. Again, the differences may be due more to institutional dissimilarities, sample characteristics, and the types of instruments used than to actual problems in the model itself. Further, the studies did not attempt to comment on specific institutional practices, services, programs, or procedures (with the exception of informal faculty contact) that may be related to the level and quality of a student's social and academic integration. However, as frequently suggested throughout this chapter, such an analysis is most appropriately conducted with the specific campus in mind. And although individual institutional studies "have been roundly criticized as methodologically uneven [and] based on inadequate definitions, designs, sampling plans, instruments and analytical procedures," it is nonetheless important to have a comparison of previous work to focus current research. This chapter has attempted to provide the comparison that will be necessary to evaluate the outcomes of this study.

In retrospect, a value and bias of the writer was never clearly stated to the reader, although implied throughout this chapter. This bias was hinted at through a quotation from Astin (1975) in discussing the fact that, for some individuals, dropping out of a particular institution and/or higher education altogether may not be an unhealthy decision. Yet, the frequency and rate of dropout as well as Astin's (1975) own work cannot be accepted as so many students who find more beneficial ways to grow, develop, and contribute to their communities. As Bowen (1977) wrote in Investments in Learning:

Higher education greatly enhances the practical competence of its students as citizens, workers, family members, and consumers. It also influences their leisure activities, their health, and their general ability to cope with life's problems. Perhaps the main influence of college on practical competence is that it helps students develop skills and traits of general applicability such as verbal facility, substantive knowledge, rational approach to problems, intellectual tolerance, future orientation, adaptability, and self-confidence. (p. 434)

One hardly needs more reason than this to examine previous research, allowing it to focus current study and to stimulate renewed interest in reducing the rate of attrition. To opt for the conclusion that an institution's dropout rate is acceptable is to deny that it has any educational responsibility to the broadest segments of society.

CHAPTER III

DESIGN AND METHODOLOGY

The researcher's purpose in this study was to identify and examine the reasons why first-time college freshmen who entered Michigan State University during Fall Term 1981 did not return to resume their degree work in Fall 1982. The students chosen for this investigation were from the entering-freshman class due to the high attrition rate between their first and second years. Additionally, it was found that there had not been a systematic investigation of attrition in the past ten years at MSU. Further, at no time had a local study been done using the method and design employed in this investigation.¹

This chapter restates the hypotheses in research form, reviews the population sample, instruments, administration of the instruments and data collection, and the statistical procedures chosen to test the hypotheses.

¹Permission to conduct this study was received from the University Committee on Research Involving Human Subjects (1/29/82), the University Committee on Release of Confidential Information (1/29/82), the MSU Office of Admissions and Scholarships (2/1/82), the MSU Office of the Registrar (1/29/82), and the University Housing Programs Office (12/17/81).

Hypotheses

The basic hypotheses for this study were stated in literary form in Chapter I. They are restated here in the operational null form:

1. The variables selected from the Student Profile Section of the American College Test and used to measure entering-freshman characteristics will not result in a substantive discriminant function distinguishing freshman-year persisters and freshman students who do not return for their second year.
2. When variables selected from the Student Profile Section of the American College Test (used to measure entering-freshman characteristics) are entered in a stepwise fashion into the discriminant analysis, the precollege characteristics of family income, high school academic performance, and educational aspirations will not be found as the best discriminating variables between freshman-year persisters and students who do not return for their second year.
3. The variables measured by the College Experiences Scale II which correspond to the categories of social and academic integration, when entered into a discriminant analysis, will not result in a substantive discriminant function distinguishing freshman-year persisters and students who do not return for their second year.
4. The variables that correspond to the categories of social and academic integration from the College Experiences Scale II, when entered in a discriminant analysis, will not be found as better discriminators between freshman-year persisters and students who do not return for their second year than precollege characteristics.
5. When variables selected from the CES II are entered in a stepwise fashion into the discriminant analysis, the School Activities, Peer, and Faculty Interactions scales will not be found to have the most discriminating power between freshman-year persisters and students who do not return for their second year along the social dimension.
6. The variables that correspond to the category of academic integration, when entered into a discriminant analysis, will not be found as better discriminators between freshman-year persisters and students who do not return for their second year than variables that correspond to the category of social integration.

7. When variables selected from the Student Profile Section of the American College Test and variables from the College Experiences Scale II are entered in a stepwise fashion into the discriminant analysis, the CES II scales--Faculty Concern for Student Development and Teaching and Faculty Interactions (which measures the amount and quality of faculty contact)--will not be found to have the best discriminating power of any variables in the study.
8. Those variables that successfully discriminate between freshman-year persisters and students who do not return for their second year, when controlled for sex of the students, will not be found to be different.

Population and Sample

The population for this study was the entering freshman class for Fall 1981 at Michigan State University. To reduce the chances of error due to differences in the students, a number of parameters were employed to increase the homogeneity of the sample. The population was therefore more specifically defined as students who entered college for the first time, were not enrolled in any of MSU's two-year programs, had completed the American College Testing program before enrollment, had lived on campus in MSU's residence halls, and were enrolled during Winter Term 1982. It is noteworthy to point out that approximately 95% of all freshman students live on campus in residence halls, as required by the MSU Housing Policy and approved by the MSU Board of Trustees.¹ Further, Astin (1975) showed that persistence rates are significantly different between on-campus and off-campus students, and, more important, these differences are associated with the living environment.

¹Information was obtained through historical records maintained by the Housing Office, Department of Residence Halls, MSU.

Approximately 6,288 students entered as freshmen for Fall Term 1981. With the assistance of the MSU Data Processing Department and using the parameters stated above, 3,400 students were chosen by a random-sampling program for inclusion in the study. This figure was arrived at when the following conditions were considered in addition to the aforementioned parameters:

1. Seventeen to 20 percent of the freshman class will not return for Fall Term 1982 (or approximately 1,006 using 16% as a conservative figure).

2. According to historical data maintained by the MSU Registrar's Office, approximately 400 students will leave at the end of Fall 1981 following their initial enrollment. This will reduce the eligible sample to 5,828 from the original size of 6,288.

3. A minimum of 100 students was needed in the nonreturning group for meaningful analysis.

4. A 50% response rate was expected from the CES II questionnaire.

Therefore, if 3,400 students were administered the questionnaire and 1,700 returned usable surveys (50% response rate) and a conservative predicted dropout rate of 16% is used, it was expected that approximately 272 students would not return. This figure was well over the 100 students needed for statistical analysis.

Another issue considered by this researcher was controlling for students who were academically dismissed as opposed to those who voluntarily chose not to return. Tinto (1975) pointed out that when a study of attrition is conducted, it is important that students who

voluntarily leave are examined separately from those who are academically dismissed. He found that these two nonreturning groups of students report significantly different experiences on the campus, and these experiences are associated with their reasons for attrition. In view of this finding, students who were academically dismissed were coded differently than students who voluntarily did not return. To accomplish this, students who returned usable questionnaires during Winter Term 1982 were matched against all students who enrolled for Fall Term 1982. With the assistance of the MSU Office of Planning and Budget, the "10th of term tape" (i.e., enrolled students on the 10th day of Fall Term 1982) was used as the matching list. This procedure resulted in 269 students who were not enrolled for Fall Term 1982 from the original group of students who returned usable questionnaires, or 1,962 students. This investigator then hand checked the academic records of the 269 students to verify that they were enrolled Winter Term 1982 and to determine which students had been academically dismissed.

In summary, both returning and nonreturning students sampled from the population of 5,828 entering freshmen of Fall 1981 were similar in that they:

1. Entered college for the first time
2. Were not enrolled in any two-year technical program
3. Completed the SPS-ACT before enrollment
4. Lived in undergraduate MSU residence halls
5. Were enrolled for Winter Term 1982

The nonreturning-student sample was further subdivided into two groups: those students who were academically dismissed and those who voluntarily chose not to return.

Instrumentation

As stated in Chapter I, the design for this study was longitudinal across 12 months. To fulfill the data requirements for this design, two sources of survey data needed to be collected: precollege entering characteristics and measures of the student's collegiate experiences within the academic and social subsystems. To accomplish these information requirements, the MSU Office of Admissions' ACT Cumulative Tape, containing the results of each student's ACT-SPS and data from a questionnaire, the College Experiences Scale II, were used.

The source of precollege entering characteristics was the Student Profile Section of the American College Testing Program (SPS-ACT). First developed in 1959, the ACT program is widely used by institutions of higher education as a reliable provider of student-assessment data obtained initially for the purposes of "counseling, placement and admission of students to college" (ACT Assessment Program, 1973, p. 29). The Student Profile Section, added in 1964, collects six categories of information from students: educational-vocational plans, out-of-class high school accomplishments, educational needs, extracurricular plans, factors influencing college choice, and student biographical data. The addition of the SPS has assisted the ACT program with moving beyond its original purposes as originally

developed in 1959. One of the primary uses of the ACT program today is the development of data for institutional planning and research:

There are a number of ways in which ACT data are used in institutional planning. Such uses range from dissemination of descriptive summaries of entering freshmen . . . to studies of dropouts or students majoring in different fields. (ACT Assessment Program, 1973, p. 215)

The precollege characteristics selected from the SPS-ACT for inclusion in this study were divided into four groups:

- I. Individual Attributes
 1. Sex
 2. High school GPA
 3. High school class rank
 4. ACT composite score
- II. Family Background
 1. Community size
 2. Family income
- III. Educational Experiences Before College Entry
 1. High school extracurricular activities
 2. Evaluation of high school experience
- IV. Expectations of College Experience
 1. Decidedness of college major
 2. Highest degree expected
 3. Expected educational needs
 4. Expected first GPA in college
 5. Expected college extracurricular involvements

These items were selected from the SPS-ACT after an extensive review of the literature revealed their contributions to understanding student attrition and persistence.

The second major category of information collected from the students was a measure of their experiences on the campus. A modified form of the College Experiences Scale developed by Downey et al. (1980) was used. The original scales were developed at the Center for Student Development, Kansas State University, in 1977. They were designed

using Tinto's model (1975) as a backdrop to measure "a variety of activities at the university (social integration)" (Downey et al., 1980, p. 168). The questionnaire consists of 60 items, nine scales using a "yes-no" forced-choice format. Testing the reliability and construct validity of the items, Downey et al. determined that the scales could be useful in research that was designed to compare differences between groups such as investigations of attrition and persistence.

However, the Downey et al. instrument is limited in that it measures only half of the college environment as defined by Tinto (1975). That is, the nine scales focus primarily on the social subsystem. Therefore, the questionnaire was modified to include items that measured the academic subsystem. Tinto (1975) stated that the components of this aspect of his model are grade performance, the individual's assessment of his/her intellectual development, and contact with faculty primarily, but not exclusively, in the classroom setting. While nonclassroom faculty contact is placed in the social dimension, Tinto went on to point out that such interaction enhances academic integration.

The modifications, as suggested above, included an item requesting the student's current grade point average and items developed by Pascarella and Terenzini (1980). These researchers developed 34 items to measure the social and academic subsystems as well as other dimensions of Tinto's model. Following a study that was conducted to "examine the predictive validity of the measure" (p. 61), five scales with 29 items resulted. The factor-analysis procedure in

the study produced two scales that correspond to the definitions of the model in reference to the academic subsystem. These two scales were added to the Downey instrument.

It is noteworthy to point out that the nine Downey et al. scales and the two Pascarella and Terenzini scales were included in the questionnaire without modification. This was done to protect the validity studies already conducted by the researchers. As a result, the modified version of the questionnaire, the College Experiences II (CES II), contained 74 items in a "yes-no" forced-choice format. The titles of the scales and a representative item for each are as follows:

1. Academic Activities: Have you studied with other students in your major?
2. Peer Interactions: Have you made three new friendships on this campus?
3. Faculty Interactions: Have you had a faculty member call you by name outside of class?
4. School Activities: Have you participated in an organized club?
5. Family Interactions: Have you had a visit from your parents (or other members of your family)?
6. Growth and Development Activities: Have you talked to a counselor or another campus resource person about your career plans and goals?
7. Community Activities: Have you become acquainted with someone from the community who was not associated with the university?

8. Personal Time: Have you tried to be alone for awhile each day?

9. Work Activities: Have you on balance, enjoyed the work you have done?

10. Faculty Concern for Student Development and Teaching: Few of the faculty members I have had contact with are generally interested in students.

11. Academic and Intellectual Development: I am satisfied with the extent of my intellectual development since enrolling in this university.

To test the reliability of the modified questionnaire, the researcher used the reliability procedure available through the computer program, Statistical Package for the Social Sciences (SPSS). Data were entered into an SPSS system file, and the alpha model (Cronbach's alpha) was used as the reliability coefficient. However, with dichotomous data, as in the CES II, alpha is equivalent to a Kuder-Richardson-20 coefficient. A second statistic is also reported with this procedure, standardized item alpha, which essentially is the standardization of the observations by dividing them by their standard deviations and then applying the reliability procedure.¹

The values of the reliability coefficients computed for the CES II are compared with the findings of the subscales' original authors in Table 3.1.

¹SPSS-6000 Supplement (East Lansing: Michigan State University Computer Laboratory, 1981), pp. 12-23.

Table 3.1.--Comparison of subscale reliability coefficients--CES II.

Subscale	Previous Research		Current Investigation	
	Cronbach Alpha		Cronbach Alpha	Standardized-Item Alpha
1. Academic Activities	.48	Downey et al. (1980)	.35	.35
2. Peer Interactions	.72	Downey et al. (1980)	.56	.61
3. Faculty Interaction	.63	Downey et al. (1980)	.59	.59
4. School Activities	.57	Downey et al. (1980)	.50	.51
5. Family Interactions	.60	Downey et al. (1980)	.45	.45
6. Growth and Development	.43	Downey et al. (1980)	.42	.42
7. Community Activities	.27	Downey et al. (1980)	.15	.14
8. Personal Time	.45	Downey et al. (1980)	.41	.41
9. Work	.77	Downey et al. (1980)	.95	.95
10. Faculty Concern for Student Development and Teaching	.82	Pascarella and Terenzini (1980)	.50	.51
11. Intellectual Development	.74	Pascarella and Terenzini (1980)	.66	.67

Sources: Downey et al., 1980, p. 162; Pascarella and Terenzini, 1980, pp. 66-67.

With one exception, the reliability coefficients computed from the current sample data were consistently lower than those found in previous research. The differences ranged from .01 on the subscale Growth and Development to .32 on the subscale Faculty Concern for Student Development and Teaching. However, the subscale, Work, showed an increase of .18 from previous research to the study currently under investigation. As a result of these values, the CES II demonstrated low to moderate reliability. Although Downey et al. (1980) and Pascarella and Terenzini (1980) would argue that their subscales are acceptable for measuring group differences, findings from the current study require that the questionnaire results be interpreted carefully.

Data Collection and Statistical Analysis

A majority of the sampled students completed the SPS-ACT during their senior year in high school. However, some students may have taken the test as early as March of their junior year. To avoid a problem that would be apparent in two testing periods, "adjustments [were] made in the scores to eliminate any systematic advantages related to educational level and time of year of testing" (ACT Assessment Program, 1980, p. 4).

The SPS-ACT information used in this study was obtained by merging the MSU Office of Admissions Tape for Fall 1981 freshmen with the tape of sampled students in this study.

The second data collection obtained through the use of the CES II occurred during the eighth week of Winter Term 1982 or the

week of February 22, 1982. The questionnaire (coded for follow-up) was accompanied by a cover letter and addressed to each student in the sample. Residence-hall staff (resident assistants) were asked to give the questionnaires to their sampled residents, requesting that the survey be completed and returned in four days. The resident assistants were instructed to give the questionnaires to the students and only request that they read the instruction page and not pressure students toward completing the instrument in any way. Students were also provided with a brown, addressed mailing envelope and instructed to place the completed questionnaire in the envelope (sealing it) and return the material to the resident assistant. The completed questionnaires were returned to the building directors, who, in turn, forwarded them to the researcher.

Following these two data collections, SPS-ACT and the CES II, the information was held until after registration Fall Term 1982. Approximately two weeks after registration or on the tenth day of the term, the MSU Registrar's Office compiled an enrollment tape. This tape, with the assistance of the Office of Planning and Budget, was matched against the sample of students who returned usable surveys. As a result, a list of returning students and nonreturning students was compiled. Additionally, as mentioned earlier, the nonreturning students were further subdivided into two groups: those who were academically dismissed and those who voluntarily chose not to return. The information--return, nonreturn, dismissed, or voluntary--was coded into the master data file for statistical analysis.

To test the hypotheses, the subprograms Crosstabs, Discriminant, and Stepwise Discriminant from Statistical Analysis Systems were used. The Crosstabs procedure provided a chi-square analysis of the returning and nonreturning students as a preliminary indicator of those variables that may be discriminators between the two groups. The Stepwise Discriminant Analysis isolated those variables that were the "statistically best discriminators," and the Discriminant procedure constructed a classification function with the "best discriminators" using this function to predict the group membership from a student's score on the discriminating variables (Nie et al., 1975, p. 435).

Analysis of Hypotheses 1 through 7 began with the Crosstabs procedure using a chi-square to test for group independence. The intention of these results, as already mentioned, was to provide an initial indication of the variables most likely identified as discriminators through the discriminant procedure. Further, chi-square reveals the direction of group differences, whereas discriminant only isolates the distinguishing variables. For example, given that discriminant isolates Peer Interactions as a variable that distinguishes between returning and nonreturning freshmen, the information does not show which group had more (or less) frequency of interaction. The chi-square results can be employed as a means to clarify the direction of this difference.

Following the chi-square tests, each of the seven hypotheses was tested using the Stepwise Discriminant procedure. This test isolates variables that combine to form a function that mathematically

forces the two groups of students to be as distinct as possible. In addition to producing functions that may be statistically significant, it also computes the Canonical Correlation, Partial R^{*2} , and Wilks's Lambda statistics, which are used to judge the presence of substantive or meaningful discrimination. If substantive discrimination appears to be present, a classification table is produced through the procedure, Discriminant. The classification table then reveals the percentage of students correctly classified as either returning or nonreturning, based on their known group membership. More than 50% of each group of students should be correctly classified to show that the discriminant function produces results better than chance. It is on the basis of substantive discrimination that each of the hypotheses was either accepted or rejected (Nie et al., 1975, pp. 445-48).

To test Hypothesis 8, each analysis was computed three times. The first analysis included total returning students compared with total nonreturning students. The second and third analyses compared returning men with nonreturning men and then returning women with nonreturning women. Differences between each group were noted.

Summary

This chapter described the methods and procedures used in the study, including the hypotheses, sample, instruments, data collection, and statistical procedures for analysis.

The population included new MSU freshmen enrolled during Winter Term 1982 who lived in undergraduate residence halls and intended to pursue a four-year degree program.

The data for this study were collected through the use of the SPS-ACT program on file with the MSU Office of Admissions and by administering the CES II. These two instruments were used to measure precollege entering characteristics of the student sample and their subsequent experiences on the campus following enrollment along the dimensions of social and academic integration.

The statistical procedure, Discriminant, was used to identify those variables that successfully distinguished between returning and nonreturning students, and a stepwise procedure, Wilks's Lambda, was used to identify which variables demonstrated the best discriminating power.

Chapter IV presents the analysis and findings from the data gathered for this study.

CHAPTER IV

PRESENTATION OF ANALYSIS OF THE DATA

Introduction

This chapter presents an analysis of the data collected to test the hypotheses of this study. The purpose of this research was to examine the reasons why freshmen who entered Michigan State University during Fall Term 1981 did not return to resume their degree work in Fall 1982. The study was conducted using a longitudinal design across 12 months and collected two categories of information. Data were obtained before the student's initial enrollment at Michigan State University (precollege characteristics) and again while the student was enrolled during the first year (college experiences).

The population for this study was the entering-freshman class for Fall 1981. Five characteristics were common among this group and were used to reduce the chances of error due to differences among the students. Each student:

1. Entered college for the first time
2. Was not enrolled in a two-year technical program
3. Had completed the American College Test (ACT) before enrollment
4. Lived in an MSU undergraduate residence hall
5. Was enrolled for Winter Term 1982

A computer program was developed to sample 3,400 students on a random basis from the total freshman population of 6,288. The 3,400 students met the above five conditions and became the sample studied in the research.

Following an extensive literature review to study both previous research designs and variables that were associated with attrition, two instruments were chosen to fulfill the data requirements of the longitudinal design. The American College Test, Student Profile Section (SPS) was used to provide information about the student's precollege characteristics. These data had been collected before the student's enrollment and were stored on a data tape maintained by the MSU Registrar's Office. The College Experiences Scale II, a questionnaire administered during the eighth week of Winter Term 1982, was used to collect information about the nature of the student's collegiate experiences along two dimensions, academic and social. Once the second data collection occurred, both sets of information were held until the tenth day of Fall Term 1982. On that date, students who had originally participated in the study were separated into two groups, those students who re-enrolled for Fall Term 1982 (returning students) and those who did not re-enroll (nonreturning students).

Of the 3,400 students sampled, 2,064 returned questionnaires (or 60.7%) that were administered during Winter Term 1982. Approximately 4.9% or 102 of the returned questionnaires were not usable due to incomplete information or because the student did not have SPS information on file. Following Fall Term 1982 enrollment, it was found that 265 students were not registered, and 25 of those

students had been academically dismissed. This reduced the number of voluntary nonreturning students to 240, of whom 134 were women and 106 were men. There were 1,697 students who were classified as returning students, with 982 women and 715 men. (See Table 4.1.)

Table 4.1.--Sample data.

Total sampled:	3,400 freshman students
Questionnaires Returned--W 82:	2,064 (60.7%)
Unusable:	102 (4.9% of returned)
Not enrolled Fall 1982:	269 students
Academically dismissed:	25 students
Voluntary nonreturns:	240 students (134 women, 106 men)
Returning students:	1,697 students (982 women, 715 men)

As previously noted, the SPS data were collected before the student's enrollment, and responses were coded on a data tape. The responses to the questionnaires were key-punched onto data-processing cards and then machine read onto another data tape. Both data tapes were merged by computer assistance and then merged a second time with the Student Master Data Tape (SMDT) to determine returning or non-returning classification. The SMDT contains enrollment information, among other items, and is also maintained by the MSU Registrar's Office. Following the merging of the SMDT, a master data file resulted to accommodate computer-assisted statistical analysis. The software package, Statistical Analysis System, was used to compute

the data analysis using the subprograms Crosstabs with chi-square, Stepwise Discriminant Analysis, and Discriminant Analysis.

Analysis of the Hypotheses

Hypothesis 1

This hypothesis, written in the null form, stated that selected variables from the Student Profile Section of the American College Test will not successfully discriminate between freshman-year persisters and nonreturning students. Before computing the stepwise discriminant analysis to isolate those variables that discriminated between the two groups, a cross-tabulation on each of the 12 variables with a chi-square test for independence was computed. This analysis was completed for the total group (returning compared with nonreturning) and for female (returning--FRET and nonreturning--FNON) and male (returning--MRET and nonreturning--MNON) students.

Table 4.2 shows that returning and nonreturning students were not independent on two variables: high school class rank and decidedness of college major.

More returning students than expected and fewer nonreturning students than expected reported being in the top quarter of their high school graduating class. The opposite was true when the two groups were compared on the second quarter of their class. None of the students in this sample reported being in the third or fourth quarter of their high school graduating class.

Table 4.2.--Chi-square of significant SPS variables: total group.

ITEM: High School Class Rank					
Frequency Expected Row Percent	Missing	Top Quarter	Second Quarter		
Nonreturns	2	141 158 59.24	97 80 40.76		240
Returns	26	1,123 1,106 67.20	548 565 32.80		1,697
$\chi^2 = 5.87$ $p = .025$ $df = 1$					
ITEM: Decidedness of College Major					
Frequency Expected Row Percent	Missing	Not Sure	Fairly Sure	Very Sure	
Nonreturns	3	104 82 43.88	92 105 38.82	41 50 17.30	240
Returns	19	559 581 33.31	757 744 45.11	362 353 21.58	1,697
$\chi^2 = 10.39$ $p = .01$ $df = 2$					

More returning students than expected and fewer nonreturning students than expected indicated that they were "fairly" or "very sure" about their intended major in college. The trend reversed itself with more nonreturning students than expected and fewer

returning students than expected stating that they were "not sure" of their intended college major.

Differences by sex began to appear when reviewing female students separately from male students. Table 4.3 shows that returning females (FRET) were not independent from nonreturning females (FNON) on two variables: high school GPA and high school class rank.

Although the results were somewhat mixed on the variable of high school grade point average, it was generally found that more returning women and fewer nonreturning women than expected had grade point averages in the range of 2.33 to 4.00. The trend requires careful review as more nonreturning women than expected compared to returning women had grade point averages in the 3.67 to 3.75 categories.

The variable of high school class rank demonstrated a more clearly consistent result. Similar to the total group, more returning women and fewer nonreturning women than expected reported being in the top quarter of their high school graduating classes. Again, the trend was reversed when looking at the results for the second quarter. None of the students reported membership in the third or fourth quarter of their graduating classes.

The male returning and nonreturning students also showed that the groups were not independent, but on only one item. For the men, Table 4.4 shows the results for the variable, decidedness of college major.

Interestingly, none of the male students indicated that they were "very sure" about their chosen major in college. The results did show, however, that more returning students and fewer nonreturning

Table 4.3.--Chi-square of significant SPS variables: females.

ITEM: High School GPA													
Frequency Expected Row Percent	Missing	2.33	2.50	2.67	2.75	3.00	3.25	3.33	3.50	3.67	3.75	4.00	
FNON	10	3 .6 .2	5 5.2 4	1 1.6 1	8 12.1 6	25 20.7 20	17 18.1 14	2 2.8 2	25 20.9 20	5 2.5 4	14 18.8 12	19 20.7 15	134
FRET	46	2 4.4 .2	40 39.8 4.3	13 12.4 1.4	96 91.7 10.26	153 157.3 16.35	138 136.6 14.7	22 21.2 2.35	154 158.1 16.45	12 15.0 1.3	147 142.2 15.6	159 157.3 17	982
$\chi^2 = 19.67$		p = .05						df = 10					
ITEM: High School Class Rank													
Frequency Expected Row Percent	Missing	Top Quarter				Second Quarter							
FNON	1	74 87.5 55.64				39 45.5 44.36				134			
FRET	17	648 634.5 67.15				317 330.5 32.85				982			
$\chi^2 = 6.88$		p = .01						df = 1					

male students reported being "fairly sure" of their chosen program of study in college. The opposite pattern was demonstrated for the category, "not sure."

Table 4.4.--Chi-square of significant SPS variables: males.

ITEM: Decidedness of College Major				
Frequency Expected Row Percent	Missing	Not Sure	Fairly Sure	
MNON	0	74 60.4 69.81	32 45.5 30.19	106
MRET	9	389 402.6 55.02	317 303.5 44.84	715
$\chi^2 = 8.12$	$p = .005$	$df = 1$		

Following the chi-square analysis, a stepwise discriminant analysis was computed using the 12 variables selected from the Student Profile Section of the American College Test. The stepwise procedure attempts to determine the variables that successfully discriminate among the 12 considered and the degree of their discriminating power. The amount of discriminating power can be examined through the use of two statistics computed as a part of the stepwise procedure: the Partial R**2 and Wilks' Lambda. The Partial R**2 computes the amount of variance that is explained by a discriminating variable(s) among the scores of the returning and nonreturning students around their group centroid (grand mean for all the variables of a particular

group). Wilks' Lambda, on the other hand, is a measure of residual discrimination:

By "residual discrimination," we mean the ability of the variables to discriminate among the groups beyond the information that has been extracted by the previously computed functions. . . . Values of Lambda which are near zero denote high discrimination (i.e., the group centroids are greatly separated and very distinct relative to the amount of dispersion with groups). (Klecka, 1980, pp. 38-39)

A third statistic, also computed in the stepwise procedure, is used to measure the usefulness of a discriminating variable or set of variables. The Canonical Correlation produces this third method through a coefficient that "summarizes the degree of relatedness between groups and the discriminant function" (or set of related discriminating variables) (Klecka, 1980, p. 36). This statistic, similar to the Pearson product-moment correlation coefficient, is a measure of association, with values near zero representing little or no association to a maximum of plus or minus one, showing a strong degree of relatedness.

Table 4.5 presents the summary of the first stepwise analysis computed for all returning and nonreturning students. Using the criterion to enter the model of an F-test from an analysis of covariance with an alpha level of .10, three variables were entered:

1. NCERTAIN: The degree of decidedness a student has about his/her chosen college major
2. ACTC: American College Test composite score
3. NQ59: Family income

Table 4.5.--Stepwise selection summary of SPS variables for the total group.

Step	Variable Entered	Partial R**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	NCERTAIN	.0039	6.761	.0094	.996	.0094	.004
2	ACTC	.0031	5.358	.0207	.993	.0024	.007
3	NQ59	.0022	3.819	.0508	.990	.0013	.009

The results showed that the three variables did discriminate between the two groups (returning versus nonreturning students) with "statistical significance." However, the values of the Partial R^2 , Wilks' Lambda, and the Average Squared Canonical Correlation demonstrated that the function had very little substantive utility. Only .0022 of the variance was accounted for after the third variable, NQ59, was entered. Further, the Wilks' Lambda showed that the centroids of both groups were almost identical; that is, no group differences could be found. Finally, the canonical correlation suggested a very low degree of association among the variables in the function and the two groups.

Tables 4.6 and 4.7 present similar results for the stepwise process when the groups are controlled for sex.

The variables NCERTAIN, NESTGPA, and EXPEXT were entered into the stepwise model as a function that discriminated between returning and nonreturning female students with statistical significance:

1. NCERTAIN: The degree of decidedness a student has about his/her chosen college major
2. NESTGPA: Estimated grade point average, first year at college
3. EXPEXT: The amount of a student's expected involvement in college extracurricular activities

Similarly, the variables NQ59, ACTC, and EXTRA were isolated by the model as constructing a function that distinguished between returning and nonreturning male students:

Table 4.6.--Stepwise selection summary of SPS variables for females.

Step	Variable Entered	Partial R**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	NCERTAIN	.0040	3.900	.0486	.996	.0486	.004
2	NESTGPA	.0041	3.976	.0464	.992	.0197	.008
3	EXPEXT	.0032	3.109	.0782	.989	.0120	.011

Table 4.7.--Stepwise selection summary of SPS variables for males.

Step	Variable Entered	Partial R**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	NQ59	.0103	7.740	.0055	.989	.0055	.010
2	ACTC	.0052	3.917	.0482	.985	.0030	.015
3	EXTRA	.0037	2.800	.0947	.980	.0026	.019

1. NQ59: Family income
2. ACTC: American College Test composite score
3. EXTRA: The amount of a student's high school extra-curricular involvement

Again, however, the substantive significance of both functions was very low when considering the amounts of explained variance and residual discrimination. Less than four-hundredths of 1% of the variance was explained by the functions for either group, and the measure of residual discrimination showed the group centroids were, again, practically identical.

Therefore, despite the suggested differences from the chi-square analysis and the direction of those differences, the null hypothesis was accepted. Selected variables from the Student Profile Section of the American College Test did not successfully discriminate between freshman-year persisters and nonreturning students.

Hypothesis 2

The second hypothesis, written in the null form, stated that the precollege characteristics of family income, high school academic performance, and educational aspirations will not be found to have the best discriminating power between freshman-year persisters and nonreturning students. The category of educational aspirations was measured by three variables: (1) decidedness of college major--NCERTAIN, (2) expected level of college performance during the first year of college--NESTGPA, and (3) highest college degree expected--NDEGASP.

Referring to Table 4.5, the variables of family income (NQ59) and decidedness of college major (NCERTAIN) were among the variables with the best discriminating power. Although the researcher was expecting to find either high school class rank or high school grade point average as direct measures of high school academic performance, the variable measuring achievement, or the American College Test composite score (ACTC), was entered into the model. The variable of ACTC could be viewed as an indirect measure of high school academic performance. Table 4.5 displays the variables of NCERTAIN, ACTC, and NQ59 (the ordering was based on the magnitude of the F-statistic) as having the most power to separate the groups of returning and non-returning students. However, as previously noted, while the amount of separation was statistically significant (due largely to the number of degrees of freedom--1,1721), the substantive discrimination was very low. The results of the Partial R^2 , Wilks' Lambda, and the Average Squared Canonical Correlation withdrew any confidence that could be placed in the predictive ability of these variables.

Tables 4.6 and 4.7 demonstrated differences by sex. The summary for females isolated the variables of NCERTAIN, NESTGPA, and EXPEXT, in that order, as having the most power among all 12 SPS variables considered in the analysis to discriminate between returning and nonreturning female students. According to Hypothesis 2, NCERTAIN and NESTGPA, both measures of educational aspirations, were expected to be among the discriminating variables. This function came the closest to the alternative of Hypothesis 2. However, EXPEXT,

the expected extracurricular involvements in college, was also significant with an F-value of 3.109.

The summary of male students in Table 4.7 isolated three different variables when compared to the female students. The items of family income (NQ59), American College Test composite score (ACTC), and the number of high school extracurricular involvements (EXTRA) were shown to manifest the most discriminating power for this group. Only one variable was expected under the second hypothesis, family income. Interestingly, family income demonstrated the most discriminating power, accounting for more of the explained variance (Partial R^2) than the other variables of ACTC and EXTRA. Further, the fact that different items were selected for men than for women leveled support for Hypothesis 8, which was premised on the notion that differences would be found when variables were controlled for sex.

When examined for substantive discrimination as opposed to statistical significance, again the functions for men and women did not present any confidence in the results. As noted during the review of Hypothesis 1, less than four-tenths of 1% of the variance (Partial R^2) was explained for either group, and the measure of residual discrimination (Wilks' Lambda) showed the group centroids as almost identical.

Therefore, in view of the results found for the total group, as well as for female and male students, the null hypothesis was accepted. The variables of family income, high school academic performance, and educational aspirations, despite some finding of statistical significance for NCERTAIN, NESTGPA, family income, and

the indirect measure of high school performance--ACTC, did not produce the best discriminating power among the 12 SPS variables considered. The researcher defined "best discriminating power" as being supported not only by statistical significance but, more important, substantive significance.

Hypothesis 3

This hypothesis, when written in the null form, stated that the variables measured by the College Experiences Scale II (CES II) to demonstrate social and academic integration will not successfully discriminate between freshman returning and nonreturning students. As with Hypothesis 1, before computing the stepwise discriminant analysis, a cross-tabulation of the variables with a chi-square test of independence between the two groups was computed. Again, the analysis was run for the total group and then separately computed for sex differences.

Four variables were found to be statistically significant for the total group: the items of school activities, family interactions, intellectual development, and current grade point average. Because of the number of these variables, separate tables are presented for each one.

Table 4.8 shows the results of the variable, school activities. With respect to participating in four to six collegiate activities, more returning and fewer nonreturning students than would be expected reported this level of involvement. Additionally, fewer returning and more nonreturning students than expected reported being

Table 4.8.--Chi-square results on the variable, participation in school activities, for the total group.

Frequency Expected Row Percent	Missing	Number of Activities Participated In									
		0	1	2	3	4	5	6	7	8	9
Nonreturns	0	13 6.9 5.42	27 21.7 11.25	51 40.7 21.25	56 54.5 23.33	52 56 21.67	25 33.7 10.42	8 16.4 3.33	5 6.1 2.08	2 3.0 .83	1 .9 .42
Returns	1	43 49.1 2.54	148 153.3 8.73	227 287.3 16.33	384 385.5 22.64	400 396 23.58	247 238.3 14.56	124 115.6 7.31	44 42.9 2.59	22 21 1.30	6 6.1 .35

$\chi^2 = 19.092$

p = .025

df = 9

involved in zero to three and seven to nine school activities. With 10 degrees of freedom, this result was significant at the .025 level.

Table 4.9 presents the results of the two groups on the variable of family interactions. This variable was composed of eight types of interactions the student could have with his/her family while in college. The scale measured the number of family interactions from none to as many as eight. The results showed that more nonreturning and fewer returning students than expected reported one to two and seven to eight interactions with their families. This trend was reversed when examining the range of three to four interactions as more returning students than expected compared with nonreturning students had this degree of involvement with their families.

Table 4.10 reports the results for the two groups on the variable, intellectual development. This scale was composed of seven items corresponding to the student's satisfaction with the influence that his/her academic experience had on his/her (perceived) intellectual development. The scale measured the number of items (0-7) that were given a positive response. The figures indicated that returning students were generally more satisfied with the effect of their academic experience on their intellectual development than were nonreturning students. More returning students than expected reported a positive response to five to seven of the items, whereas more nonreturning students than expected reported a positive response to only zero to three of the items.

The results of the group's response on the variable, current grade point average, are reported in Table 4.11. It is important to

Table 4.9.--Chi-square results on the variable, number of family interactions, for the total group.

Frequency Expected Row Percent	Missing	Number of Family Interactions									
		0	1	2	3	4	5	6	7	8	
Nonreturns	1	1 1.0 .42	5 3.6 2.09	18 14.0 7.53	27 31.5 11.3	30 43.0 12.55	55 55.9 23.01	54 52.1 22.59	32 29.9 13.39	17 7.8 7.11	240
Returns	11	7 7.0 .42	24 25.4 1.42	95 99.0 5.63	227 222.5 13.46	316 303 18.74	395 394.1 23.43	366 367.9 21.71	209 211.1 12.4	46 55.2 2.73	1,697

$\chi^2 = 19.805$

p = .025

df = 8

Table 4.10.--Chi-square results on the variable, intellectual development, for the total group.

Frequency Expected Row Percent	Missing	Number of Items Given a Positive Response							
		0	1	2	3	4	5	6	7
Nonreturns	1	15	34	30	42	39	45	21	13
		7.9	18.1	22.9	34.1	38.3	51.7	46.4	19.7
		6.28	14.23	12.55	17.57	16.32	18.83	8.79	5.44
Returns	3	49	112	155	234	271	373	354	146
		56.1	127.9	162.1	241.9	271.7	366.3	328.6	139.3
		2.89	6.61	9.15	13.81	16.00	22.02	20.90	8.62
		1,697							

Table 4.11.--Chi-square results on the variable, current grade point average, for the total group.

Frequency Expected Row Percent	Missing	Number of Students/Grade Point Category						
		.9-1.4	1.5-1.9	2.0-2.4	2.5-2.9	3.0-3.4	3.5-4.0	
Nonreturns	13	13 7 5.73	49 26.8 21.59	52 45.2 22.91	55 67.1 24.23	41 54.3 18.06	17 26.6 7.49	227
Returns	30	45 51.0 2.70	175 197.2 10.50	325 331.8 19.50	505 492.9 30.29	412 398.7 24.72	205 195.4 12.30	1,697

$\chi^2 = 38.042$

p = .0001

df = 5

note that these scores were a student's self-report of what they believed was their current grade point average. Yet, it has been found in related studies, particularly ones in which students reported their high school grades, that approximately 78.0% of the students reported their GPA's accurately, and over 97.0% were within one letter grade of what school officials reported (ACT Assessment Program, 1973, p. 308).

The results showed that there was a consistent trend for both returning and nonreturning students. More returning students and fewer nonreturning students than expected had grade point averages in the 2.50-4.00 range. Conversely, more nonreturning and fewer returning students than expected had grade point averages in the .9-2.40 range. The pattern was clear: Nonreturning students tended to have grades in the lower range of the scale, whereas returning students tended to be more likely found in the 2.50-4.00 range. As will be seen later, this same profile was repeated when the samples were controlled for sex.

As in Hypothesis 1, the results began to show differences when the groups were controlled for sex. (However, two variables, intellectual development and current grade point average, were significant for both groups.) The chi-square analysis for female students demonstrated that the returning and nonreturning women were dependent on the variables of school activities, family interactions, intellectual development, and current grade point average. The male returning and nonreturning groups were dependent on faculty concern for student development and teaching, intellectual development,

and current grade point average. Table 4.12 presents these results for female students, and Table 4.13 demonstrates the results for the male students.

Similar to the total group, the results for the variable, school activities, showed more returning and fewer nonreturning female students than would be expected in the range of three to eight activities. The pattern changed with respect to zero to two activities, with more nonreturning female students reporting this amount of participation in collegiate extracurricular activities. These results clearly suggested that returning female students are characteristically more involved in extracurricular functions than are their nonreturning counterparts.

The variable, family interactions, also showed results similar to the total group. More nonreturning and fewer returning students than expected reported zero to two and seven to eight interactions with their families. However, more returning students than expected reported a range of three to five interactions. Given this pattern and its similarity to the total group, the results suggested that there may be an optimal range of interaction frequency with one's family and that this is positively associated with persistence.

Continuing with the similarity to the total group, female returning students consistently reported more perceived satisfaction with the influence of their academic experience on their intellectual development than nonreturning students. More returning students than expected reported a positive response to five to seven of the items,

Table 4.12.--Chi-square of significant CES II variables for female students.

ITEM: School Activities												
Frequency Expected Row Percent	Missing	Number of Activities Participated In										
		0	1	2	3	4	5	6	7	8	9	
FNON	0	9 3.5 6.72	20 13.6 14.93	31 24.0 23.13	27 32.1 20.15	24 27.4 17.91	13 18.0 9.70	4 9.1 2.99	4 4.4 2.99	1 1.3 .75	1 .5 .75	
FRET	1	20 25.5 2.04	93 99.4 9.48	169 176 17.23	240 234.9 24.46	204 200.6 20.80	137 132 13.97	72 66.9 7.34	33 32.6 3.36	10 9.7 1.02	3 3.5 .31	
$\chi^2 = 22.708$		p = .0069									df = 9	
ITEM: Family Interactions												
Frequency Expected Row Percent	Missing	Number of Family Interactions										
		0	1	2	3	4	5	6	7	8		
FNON	0	1 .5 .75	2 1.2 1.49	8 7.0 5.97	11 14.9 8.31	14 22.4 10.45	29 30.1 21.64	33 33.1 24.63	24 19.7 17.91	12 5.2 8.96		
FRET	7	3 3.5 .31	8 8.8 .82	50 51 5.13	112 108.1 11.49	171 162.6 17.54	220 218.9 22.56	241 240.9 24.72	139 143.3 14.26	31 37.8 3.18		
$\chi^2 = 17.321$		p = .0269									df = 8	

Table 4.12.--Continued.

ITEM: Intellectual Development											
Frequency Expected Row Percent	Missing	Number of Items Given a Positive Response									
		0	1	2	3	4	5	6	7		
FNON	0	8 4.1 5.97	21 9.5 15.67	16 14.1 11.94	22 18.6 16.42	24 21.2 17.91	19 28.2 14.18	14 26.8 10.45	10 11.5 7.46	134	
FRET	1	26 29.9 2.65	58 69.5 5.91	101 102.9 10.30	133 136.4 13.56	152 154.8 15.49	216 206.8 22.02	209 196.2 21.30	86 84.5 8.77	982	
$\chi^2 = 32.162$		p = .0001				df = 7					
ITEM: Current Grade Point Average											
Frequency Expected Row Percent	Missing	Number of Students/Grade Point Category									
		.9-1.4	1.5-1.9	2.0-2.4	2.5-2.9	3.0-3.4	3.5-4.0				
FNON	7	8 4.6 6.30	21 15.1 16.54	29 25.0 22.83	38 38.1 29.92	22 29.2 17.32	9 15.2 7.09	134			
FRET	21	31 34.4 3.23	108 113.9 11.24	185 189 19.25	288 287.9 29.97	228 220.8 23.73	121 114.8 12.59	982			
$\chi^2 = 11.189$		p = .0478				df = 5					

whereas more nonreturning students than expected reported a positive response to only zero to four of the items.

Finally, the variable of current grade point average showed that more returning female students and fewer nonreturning female students than expected had grade point averages in the range of 3.00-4.00. This pattern was reversed as more nonreturning women and fewer returning women than expected had current grades in the range of .90-2.40.

Male students were similar to the female students in that the chi-square results were significant for the variables, intellectual development and current grade point average. However, male students were also found to be dependent on a new variable, faculty concern for student development and teaching. Table 4.13 presents the results for male students.

The variable of intellectual development did not present as consistent a pattern for male students as it did for female students. The data indicated that while more returning men than would have been expected reported a positive response to six to seven of the items, more nonreturning men than expected gave a positive response to five items, with the pattern again reversing on four items and making a final change for zero to three items in the scale. Generally, however, a significantly larger percentage of the returning males compared to the nonreturning males perceived more satisfaction with the effect of their academic experience on their intellectual development.

A new variable isolated when controlling for sex was faculty concern for student development and teaching. This was a five-item

Table 4.13.--Chi-square of significant CES II variables for male students.

ITEM: Intellectual Development										
Frequency Expected Row Percent	Missing	Number of Items Given a Positive Response								
		0	1	2	3	4	5	6		7
MNON	1	7 3.9 6.67	13 8.6 12.38	14 8.7 13.33	20 15.5 19.05	15 17.2 14.29	26 23.5 24.76	7 19.5 6.67	3 8.1 2.86	106
MRET	2	23 26.1 3.23	54 58.4 7.57	54 59.3 7.57	101 105.5 14.17	119 116.8 16.69	157 159.5 22.02	145 132.5 20.34	60 54.9 8.42	715
$\chi^2 = 24.169$		p = .0011							df = 8	
ITEM: Faculty Concern for Student Development and Teaching										
Frequency Expected Row Percent	Missing	Number of Items Given a Positive Response								
		0	1	2	3	4		5		
MNON	1	8 4.7 7.62	17 10.9 16.19	30 25.0 28.57	25 24.1 23.81	16 24.6 15.24	9 15.9 8.57	106		
MRET	8	28 31.3 3.96	67 73.1 9.48	163 168 23.06	161 161.9 22.77	174 165.4 24.61	114 107.1 16.12	715		
$\chi^2 = 14.833$		p = .0111					df = 5			

Table 4.13.--Continued.

ITEM: Current Grade Point Average								
Frequency Expected Row Percent	Missing	Number of Students/Grade Point Category						
		.09-1.40	1.5-1.9	2.0-2.4	2.5-2.9	3.0-3.4	3.5-4.0	
MNON	6	5 2.4 5.00	28 11.8 28.00	23 20.2 23.00	17 29.0 17.00	19 25.2 19.00	8 11.4 8.00	106
MRET	9	14 16.6 1.98	67 83.2 9.49	140 142.8 19.83	217 205.0 30.74	184 177.8 26.06	84 80.6 11.90	715
$\chi^2 = 37.873$		p = .0001		df = 5				

scale measuring the number of positive responses to the nature and quality of faculty contact. In Table 4.13, the data demonstrated that more nonreturning students and fewer returning students than expected gave positive responses to zero to three items. More returning students and fewer nonreturning students than expected indicated a positive response to four to five of the items in the scale. These results suggested that a larger percentage of returning male students than would be expected perceived a larger amount of faculty concern for student development and teaching when compared to nonreturning men.

Again, the variable of current grade point average showed more returning men and fewer nonreturning men than expected reported grades in the range of 2.5-4.0. This range was .5 broader than the table for female students. However, like the female students, more nonreturning men and fewer returning men than expected indicated current grades in the range of .9-2.40. Thus, the results were consistent across both male and female students on this variable, illustrating that returning students are more likely to have higher grade point averages than nonreturning students.

With the completion of the chi-square analysis, a stepwise discriminant analysis was initiated as a more powerful test of discriminating ability among the variables. Again, the criterion to enter the model was an F-test from an analysis of covariance with a significance level of .10.

Table 4.14 presents the results of the procedure considering the 13 variables from the CES II. Five variables were entered:

Table 4.14.--Stepwise selection summary of CES II variables for the total group.

Step	Variable Entered	Partial F**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	INTDEV	.0230	43.078	.0001	.977	.0001	.023
2	SCHACT	.0070	12.959	.0003	.970	.0001	.030
3	NCURGPA	.0064	11.872	.0006	.963	.0001	.036
4	FACINT	.0026	4.713	.0301	.961	.0001	.039
5	PERSTIME	.0017	3.043	.0813	.959	.0001	.040

1. INTDEV: Intellectual development
2. SCHACT: Number of collegiate extracurricular activities
3. NCURGPA: Current grade point average
4. FACINT: Number of faculty interactions
5. PERSTIME: Number of activities devoted to personal time

The data revealed that the five variables formed a discriminant function that was statistically significant at the .10 level. A more conservative function would be composed of the first four variables statistically significant at the .03 level. Again, however, statistical and substantive significance were widely separated. The amount of variance that was explained by the Partial R^2 was extremely low, the amount of residual discrimination was very high with a .96 lambda, and, finally, the average squared canonical correlation showed an equally low degree of association between the groups and the variables.

A more dramatic illustration of the lack of substantive discriminating power of the function can be seen through a discriminant-classification analysis:

As a check of the adequacy of our discriminant functions, we can classify the original set of cases to see how many are correctly classified by the variables being used. The procedure for classification involves the use of a separate linear combination of the discriminating variables for each group. These produce a probability of membership in the respective group, and the case is assigned to the group with the highest probability. (Nie et al., 1975, p. 436)

Table 4.15 presents the discriminant-classification table derived from the above discriminant function. As can be seen, the

classification table provides conclusive evidence that the discriminant function does not have the ability to separate between returning and nonreturning students. All of the nonreturning students were incorrectly classified as returning. However, given that all of the returning students were correctly classified, the function may be more indicative of a measure that describes returning students. That is, it lacks variables that describe nonreturning students but not students who persist.

Table 4.15.--Discriminant analysis classification summary: CES II variables: total group.

From Group	Number of Observations and Percentages Classified Into Group		
	Nonreturn	Return	Total
Nonreturn	0 0.0	226 100.0	226 100.0
Return	0 0.0	1,655 100.0	1,655 100.0
Total Percent	0 0.0	1,881 100.0	1,881 100.0

Note: Due to missing data, 56 of the 1,937 observations were not included.

As with the chi-square analysis, a stepwise discriminant procedure was computed separately for male and female students. Tables 4.16 and 4.17 demonstrate the results of these calculations.

Table 4.16.--Stepwise discriminant summary of CES II variables for females.

Step	Variable Entered	Partial R**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	INTDEV	.0208	22.326	.0001	.979	.0001	.021
2	SCHACT	.0111	11.719	.0006	.968	.0001	.031
3	COMMACT	.0048	5.092	.0242	.964	.0001	.036
4	FAMINT	.0031	3.278	.0705	.957	.0001	.043

Table 4.17.--Stepwise discriminant summary of CES II variables for males.

Step	Variable Entered	Partial R**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	NCURGPA	.0279	22.409	.0001	.972	.0001	.028
2	FACCONC	.0122	9.609	.0020	.960	.0001	.040
3	INTDEV	.0062	4.887	.0273	.954	.0001	.046
4	PERSTIME	.0043	3.347	.0677	.950	.0001	.050
5	SCHACT	.0044	3.452	.0636	.946	.0001	.054

The variables INTDEV, SCHACT, COMMACT, and FAMINT were entered into the stepwise model, creating a function that statistically separated returning and nonreturning female students:

1. INTDEV: Intellectual development
2. SCHACT: Number of collegiate extracurricular activities
3. COMMACT: Number of community activities in college
4. FAMINT: Number of family interactions

While the variables of intellectual development and school activities were also included in the function for male students, three different variables (from the function for female students) were entered into the discriminant. The three new variables were NCURGPA, FACCONC, and PERSTIME:

1. NCURGPA: Current grade point average
2. FACCONC: Faculty concern for student development and teaching
3. PERSTIME: Activities devoted to personal time

However, similar to Hypothesis 1, both functions were very low with respect to the substantive significance they provided. The Partial R^2 in both Tables 4.16 and 4.17 indicated that an extremely small portion of the variance in each group was explained. Further, the lambda showed that a very large amount of residual discrimination was left unexplained by these functions, and the average squared canonical correlation demonstrated that a minimal relationship existed between the series of variables and the returning/nonreturning male and female students.

Despite the suggested differences illustrated by the chi-square analysis, variables measured by the College Experiences Scale II did not sufficiently discriminate between returning and nonreturning students. The magnitude of the differences found in the chi-square analysis was not great enough to result in a substantively significant discriminant function for any of the three groups (total group, males, and females). The null hypothesis was accepted.

Hypothesis 4

The fourth hypothesis, written in the null form, stated that the variables measured by the College Experiences Scale II (CES II) will not be found to have better discriminating power between freshman-year persisters and students who do not return for their second year than the variables selected from the American College Test Student Profile Section (SPS). This hypothesis was written to test the premise that precollege characteristics would not have as much influence on persistence as would the actual experiences of the student once she/he was on the campus. Tables 4.5, 4.6, 4.7, 4.14, 4.16, and 4.17 need to be re-examined to determine the results of this hypothesis. Further, the statistics that were used to distinguish the "best discriminating" functions were the Partial R^2 (to measure the amount of variance explained by the set of variables), the Wilks' Lambda (which indicates the degree of separation between group centroids), and the average squared canonical correlation (which illustrates the degree of association between the function and the groups of returning and nonreturning students).

Tables 4.5 and 4.14 demonstrated the comparison for the total group. Table 4.5 summarized the function of precollege characteristics for the total group, whereas Table 4.14 provided the same data but for the college experiences or integration variables. (See Table 4.18.)

Table 4.18.--Comparison of discriminant functions of SPS and CES II variables for the total group.

	Partial R**2	Wilks' Lambda	Average Squared Canonical Correlation
Table 4.5 (SPS variables)	.0022	.990	.009
Table 4.14 (CES II variables)	.0017	.959	.040

A similar comparison can be made for female students (Tables 4.6 and 4.16) and male students (Tables 4.7 and 4.17). These comparisons are illustrated in Table 4.19.

The data revealed differences so small that they prohibited any meaningful analysis. Even when the functions were controlled for sex, minimal differences resulted. As will be remembered with the data presentations for Hypotheses 1 and 3, although the functions were composed of statistically significant variables, the amount of separation between returning and nonreturning students was negligible. In summary, no difference was found in the discriminating ability of either the precollege characteristics (SPS variables) or the college

experience/integration variables (CES II variables), and the null hypothesis was accepted.

Table 4.19.--Comparisons of discriminant functions of SPS and CES II variables for females and males.

	Partial R**2	Wilks' Lambda	Average Squared Canonical Correlation
Table 4.6 (SPS variables: females)	.0032	.989	.011
Table 4.16 (CES II variables: females)	.0031	.957	.043

Table 4.7 (SPS variables: males)	.0037	.980	.019
Table 4.17 (CES II variables: males)	.0044	.946	.054

Hypothesis 5

Written in the null form, this hypothesis stated that of the variables measured by the CES II, the scales of school activities (collegiate extracurricular activities), peer interactions, and faculty interactions will not be found as the best discriminating variables between returning and nonreturning students along the social-integration dimension.

The CES II measures 13 variables, of which nine variables correspond to the social-integration dimension. These variables are: academic activities, peer interactions, faculty interactions, school extracurricular activities, family interactions, growth and development,

community involvements, personal time, and work. While faculty interactions seemed more logically connected to the academic dimension, it measured primarily nonclassroom faculty contacts. Tinto's (1975) model stipulated that while out-of-class faculty interactions tend to influence academic integration, they are more influential in the students' social as opposed to academic adjustment.

Tables 4.14 (stepwise selection summary of CES II variables for the total group), 4.16 (for females), and 4.17 (for males) provided the data to test this hypothesis. Table 4.14 showed that two of the hypothesized variables, school activities and faculty interactions, entered the discriminant function and provided more discriminating power than any other variable along the social-integration dimension. In fact, only one other variable from this dimension met the criteria to enter the function: activity devoted to personal time. The variable of peer interactions did not meet the selection criteria and consequently was not an element of the discriminant function for the total group.

When controlling for sex, Table 4.16 showed that the variable of school activities was the only scale of the three that were hypothesized that discriminated with more power than the other variables selected along the social dimension. As can be seen, in order, community involvements and family interactions were elements of the function for female students, whereas faculty and peer interactions did not meet the selection criteria.

The data for the male students were found in Table 4.17. The results showed that only one of the variables hypothesized to be among

the best discriminating variables along the social dimension was found. The scale, school activities, was chosen ahead of activities devoted to personal time, the only two variables that met the selection criteria for the discriminant function along the social dimension. However, as indicated by the F-statistic, 3.452 and 3.347, respectively, with significance of .0636 and .0677, the relative contributions of both scales were very close.

The support for both the null and alternative hypotheses of Hypothesis 5 was mixed. When examining the total group, the most support for the alternative hypothesis was found. That is, two of the three predicted variables from the social dimension provided more discriminating power than those not hypothesized. Of these two variables, the scale of school activities provided the "best discriminating power" and was also found to be the only hypothesized scale chosen in the discriminant function for female and male students. The third variable hypothesized to be among the "best discriminators" from the social dimension, peer interactions, was not an element of any function, whereas the scale, faculty interactions, was found in the function for the total group.

Hypothesis 6

This hypothesis, in the null form, stated that variables measured by the CES II that correspond to the academic dimension will not be better discriminators than those that correspond to the social dimension. Variables measured by the CES II that are found in the academic dimension are the scales: faculty concern for student

development and teaching, intellectual development, and current grade point average. Again, Tables 4.14 for total group, 4.16 for females, and 4.17 for males provided the data necessary to test this hypothesis.

Similar to Hypothesis 5, the data were mixed for two of the three groups. Table 4.14 for the total group illustrated that of the five elements in the function, the scales of intellectual development and current grade point average held positions one and three, respectively. Clearly, the most powerful discriminating variable was intellectual development, with an F of 43.078 significant at .0001.

Table 4.16 for female students isolated only one of the three variables from the academic dimension, intellectual development. However, as the discriminant function revealed, it was the single most powerful discriminating variable of the four scales that met the selection criteria with an F of 22.326 significant at .0001.

The most support for the alternative hypothesis--that is, variables from the academic dimension will be "better discriminators" than those from the social dimension between returning and nonreturning students--was found with the male students in Table 4.17. Of the five scales that comprise this function, three variables corresponded to the academic dimension and held positions one, two, and three, respectively. The scales, current grade point average ($F = 22.409$, prob. $> F = .0001$), faculty concern for student development and teaching ($F = 9.609$, prob. $> F = .0020$), and intellectual development ($F = 4.887$, prob. $> F = .0273$), were found to be better discriminating variables than those that corresponded to the social dimensions and were elements of this function.

Hypothesis 7

The seventh hypothesis, written in the null form, stated that of all the variables measured in the study by both the SPS (precollege characteristics) and CES II (college experience and integration), the two scales of faculty concern for student development and teaching and faculty interactions will not be the best discriminating variables.

To test this hypothesis, both sets of variables were entered simultaneously into a stepwise discriminant procedure. Three analyses were run so that the total group could also be compared with the resulting function for female and male students. Table 4.20 presents the results for the total group. The results showed that the two most powerful discriminating variables were related to academic integration, intellectual development and current GPA, but were not the two hypothesized scales. In fact, only one of the scales, faculty interaction, was an element in the discriminant function, and it provided the least discriminating power of any of the variables in the function.

Table 4.21 presents the results for female students. The results showed that, again, intellectual development was the most powerful discriminating variable. The second variable, SCHACT (collegiate extracurricular activities), did not relate to the academic dimension but more appropriately corresponded to the social-integration dimension. It was not until the fourth position that one of the two hypothesized variables, faculty interactions, was chosen. Therefore, no support was found for the alternate form of Hypothesis 7.

Table 4.20.--Stepwise selection summary of CES II and SPS variables for the total group.

Step	Variable Entered	Partial R ²	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	INTDEV	.0218	36.385	.0001	.978	.0001	.022
2	NCURGPA	.0076	12.426	.0004	.971	.0001	.029
3	SCHACT	.0064	10.580	.0012	.965	.0001	.035
4	NCERTAIN	.0049	8.085	.0045	.960	.0001	.040
5	PERSTIME	.0036	5.816	.0160	.956	.0001	.044
6	EXPEXT	.0030	4.902	.0270	.954	.0001	.046
7	NQ59	.0031	5.093	.0242	.951	.0001	.049
8	FACINT	.0026	4.167	.0414	.948	.0001	.052

Table 4.21.---Stepwise selection summary of CES II and SPS variables for female students.

Step	Variable Entered	Partial R**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	INTDEV	.0212	19.877	.0001	.979	.0001	.021
2	SCHACT	.0091	8.440	.0038	.970	.0001	.030
3	WORK	.0074	6.841	.0091	.963	.0001	.037
4	FACINT	.0042	3.834	.0505	.959	.0001	.041
5	NCURGPA	.0037	3.403	.0654	.955	.0001	.045
6	NCERTAIN	.0031	2.833	.0927	.952	.0001	.048

Similar results were found for male students, as shown in Table 4.22. Similar to the previous two tables, the results demonstrated no support for the alternative form of the seventh hypothesis. While four of the variables in this function were also found in the discriminant function for female students (current grade point average, school activities, intellectual development, and degree of decidedness on college major), differences were found between men and women in both the discriminating power of these scales and the selection of the variables.

In view of these results across all three groups, the null form of Hypothesis 7 was accepted: The variables that measured the amount and quality of faculty contact were not found to have the most discriminating power among all the variables measured in this study.

Hypothesis 8

The eighth and final hypothesis, written in the null form, stated that those variables found to discriminate between freshman-year persisters and nonreturning freshman students will not be different when the sample is controlled for sex.

The reader will recall that the analyses of the previous seven hypotheses provided separate results for the comparison of the sample based on sex. While the data will not be presented in their entirety a second time, a summary is provided to highlight the findings. Further, a caution is raised in that the differences based on the discriminant functions are statistical in nature and, as pointed out

Table 4.22.--Stepwise selection summary of CES II and SPS variables for male students.

Step	Variable Entered	Partial R**2	F Statistic	Prob > F	Wilks' Lambda	Prob > Lambda	Average Squared Canonical Correlation
1	NCURGPA	.0299	21.979	.0001	.970	.0001	.030
2	EXPEXT	.0115	8.321	.0040	.959	.0001	.041
3	NQ59	.0113	8.117	.0045	.948	.0001	.052
4	FACCONC	.0107	7.704	.0057	.938	.0001	.062
5	PERSTIME	.0066	4.727	.0300	.932	.0001	.068
6	SCHACT	.0054	3.863	.0497	.927	.0001	.073
7	INTDEV	.0041	2.909	.0885	.923	.0001	.077
8	NCERTAIN	.0043	3.044	.0815	.919	.0001	.081

earlier in this review, lack meaningful substance due to the minimal separation they provide between the groups.

Differences based on sex were found in Hypothesis 1 not only with respect to the discriminant functions but also the chi-square analysis. The stepwise procedure selected the variables NCERTAIN, NESTGPA, and EXPEXT for females, while NQ59 (family income), ACT composite, and EXTRA (high school extracurricular activities) were entered in the discriminant for men. The chi-square found the variables of high school GPA, high school class rank, and EXPEXT significant for the female students; only one variable, NCERTAIN, was found for the male students. These findings supported the premise that differences would be found when the sample was controlled for sex.

Hypothesis 2 tested for the best discriminating variables of those measured under the category of precollege characteristics. While it was hypothesized that particular variables would be found, for the purposes of this section, it is important to note that the discriminant functions, as noted above, contained different variables on the basis of sex.

Hypothesis 3, similar to Hypothesis 1, found differences between the variables that composed the discriminant functions for men and women. While two variables, school activities and intellectual development, were components of both discriminant functions, their discriminating power in each group was different. The variables of INTDEV, SCHACT, COMMACT, and FAMINT, in order of discriminating power, resulted in the function for women. The variables NCURGPA, FACCONC, INTDEV, PERSTIME, and SCHACT, also in order of discriminating power,

formed the discriminant function for male students. The chi-square results for male and female students were found to be more similar than in Hypothesis 1. For female students, the returning and non-returning groups were found dependent on the variables of SCHACT, FAMINT, INTDEV, and NCURGPA, whereas the men were found dependent on the variables of FACCONC, INTDEV, and NCURGPA. Again, these results supported the importance of testing for differences between sexes.

Hypothesis 4 attempted to determine which set of variables, the SPS or CES II, provided more discriminating ability between returning and nonreturning students. As will be remembered, the differences, though favoring the CES II (college integration) variables, were so small that meaningful analysis was not possible.

The fifth hypothesis was written to determine the best discriminating variables from the CES II along the social dimension. Again, while particular variables were hypothesized, for the purpose of this eighth hypothesis, different variables were found when the sample was controlled for sex. The female students' function was composed of SCHACT, COMMACT, and FAMINT, while the male students' function comprised PERSTIME and SCHACT. These results demonstrated that differences were found when the sample was controlled for sex.

The sixth hypothesis attempted to determine the discriminating power of social-integration variables compared to academic-integration variables. Again, differences were found when the female discriminant function was compared to the male discriminant function. The function for female students was more mixed with respect to the discriminating power of the academic-integration variables over the

social-integration variables. However, the function for male students demonstrated that the academic-integration variables were consistently the more powerful discriminating variables when compared to those that corresponded to the social dimensions.

The seventh hypothesis was constructed to determine the most powerful discriminating variables when both the precollege characteristics and college experience/integration variables were entered into a stepwise discriminant procedure. Tables 4.21 and 4.22 showed that the variables selected for the female and male students were different with the exception of four variables that appeared in both functions. Yet, even the four variables that overlapped showed different placements in each function with respect to discriminating abilities.

Therefore, as the data demonstrated, six out of the previous seven hypotheses revealed different results when the sample was controlled for sex. Sufficient support did seem to exist to reject the eighth null hypothesis, although the evidence only provided statistical and not substantive significance.

Summary

The procedure, stepwise discriminant analysis, was employed to test the eight hypotheses in this study. As a preliminary indicator of the variables that may be selected by the discriminant procedure, a chi-square analysis was used for two of the eight hypotheses. In analyzing the results of the hypotheses tested, the variables found in each discriminant function did distinguish between returning

and nonreturning students with statistical significance. However, the degree of separation that resulted between the group centroids was so small that the predictive power of the function withdrew any confidence that could be placed in the statistical finding. To illustrate this, a discriminant classification analysis was computed for Hypothesis 3. The classification procedure correctly classified all returning students but incorrectly classified all nonreturning students. Only the chi-square results demonstrated any significant differences that may warrant further pursuit for Hypotheses 1 and 3.

It was found that:

1. Null Hypothesis 1, which was written to determine if a discriminant function could be constructed with precollege characteristics measured by the Student Profile Section of the American College Test, was accepted. However, significant chi-square results were obtained and differences were found in the results based on the independent variable, sex.

2. Null Hypothesis 2, which was written to determine if family income, high school academic performance, and educational aspirations (degree of decidedness on college major, expected level of college performance, and highest degree expected) would be selected as the most powerful discriminating variables among all the precollege characteristics, was only partially rejected. One of the variables, degree of decidedness on college major, from the category of educational aspirations was the most powerful discriminating variable selected; ACT composite was chosen second. The researcher has decided to accept the ACT composite as an indirect measure of high

school academic performance. The other expected variable, family income (NQ59), was selected as the third most powerfully discriminating variable of all the precollege characteristics.

3. Null Hypothesis 3, which was written to determine if a discriminant function could be constructed with college experience/integration variables measured by the College Experiences Scale II, was accepted. However, as with Hypothesis 1, significant chi-square results were obtained and differences were found in the results based on the independent variable, sex.

4. Null Hypothesis 4 attempted to determine which category of variables, precollege characteristics or college experiences, provided the most discrimination between returning and nonreturning students. While the data tended to favor college experiences, the differences were so small that the null hypothesis was accepted.

5. Null Hypothesis 5 was written to test for the best discriminating power among the college-experience variables and stated that the scales of school activities, peer and faculty interactions would not be selected. However, the variables school activities and faculty interactions were selected, while peer interactions was not chosen. Therefore, this null hypothesis was only partially rejected.

6. Null Hypothesis 6, which was tested to determine if academic-integration variables would be better discriminators than social-integration variables, showed mixed results for the total group and when the sample was controlled for female students. Only

the male students showed a consistent pattern isolating academic-integration variables over social-integration variables.

7. Null Hypothesis 7, which was tested to determine if the variables, faculty concern for student development and teaching and faculty interactions, would be the most powerful discriminating variables of all those measured in the study, was accepted.

8. Null Hypothesis 8, which stated that differences would not be found in the discriminant functions for each hypothesis, was rejected for six of the previous seven hypotheses. Only Hypothesis 4 did not reveal any differences based on the independent variable, sex.

Chapter V reports the summary, conclusions, and recommendations for further research from the study.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

As higher education enters the decade of the 1980s, many significant challenges will demand ongoing attention and effective response. Among some of the more critical issues will be the careful management of a broad range of resources that enable the continued operation of programs and activities. Specific to public higher education, this not only means a careful analysis of general-fund (state tax) revenues, but more important, the size of its student population that provides substantial monetary and nonmonetary support. As a result, attention has turned to how students are recruited with an increased emphasis on retaining them once they are enrolled. Understanding how to enable student persistence to graduation requires knowledge of why students leave a particular institution.

Student-attrition studies date back to the 1920s and reflect a number of findings, recommendations, and ways in which to examine and understand the problem. Generally, however, the research has been methodologically uneven, contradictory, and limited in its ability to explain, not merely describe, dropouts from persisters. In part, this has been due to different definitions of the term "dropout," different views of what causes the phenomenon, and an equal number of methods and designs to study the topic. Many of the

investigations have been conducted at single institutions, presenting an obvious limitation in the ability to generalize the findings. However, it is well known that research that attempts to "cut across" many institutions and provide universal findings tends to seriously mask individual differences that are critically important in responding to the problem.

Acting on the fact that institutions are not similar due to specific practices, programs, and procedures, and recognizing the importance that such elements play with respect to understanding attrition, the need to develop "local" information has taken precedence over nationally sampled studies. Additionally, it has only been in the last few years that investigators have developed models that seek to explain institutional- and student-interaction effects on dropping out.

The purpose of this study was to examine reasons why freshmen who entered Michigan State University during Fall Term 1981 did not return to resume their degree work in Fall 1982. The study was conducted within the framework of Tinto's (1975) conceptual model and focused on the problem of the voluntary dropout.

This chapter provides a summary of the development of the study, a review of the findings, its conclusions, and recommendations for further research.

Summary: Development of the Study

The first chapter presented the problem of student attrition and how it related to one institution, Michigan State University.

Components of the first chapter included the purpose and importance of the study, definition of terms, the hypotheses, an abbreviated review of the literature that supported the theoretical model, the design of the study, delimitations of the research, and limitations that were not in the researcher's control. Eight hypotheses were generated for this study and are covered in greater detail later in this chapter.

A review of the background literature that supported the hypotheses for this investigation was presented in the second chapter. Rates of attrition were examined, which revealed that Michigan State University experiences a slightly higher nonreturn rate than national findings. The contribution of precollege characteristics to the understanding of attrition/persistence was then examined with specific discussion of (1) individual attributes, (2) family background, (3) precollege educational experiences, and (4) collegiate expectations. The chapter then turned its attention to the study of theoretical models that sought to explain the interaction between the student and the college environment. The summary pointed not only to the need for developing "local understanding" of attrition but also the importance of doing so within the confines of a theoretical reference.

A description of how the study was operationalized was presented in the third chapter. Following from previous study, it was decided to continue the examination of precollege characteristics and determine the strength of their influence on freshman dropout. To obtain this information, the American College Testing Program results for the entering 1981 freshman class were accessed. The Student Profile

Section of the ACT provided data in four main categories: individual attributes, family background, educational experiences before college entry, and expectations of the college experience. As will be recalled, this information fulfills the data requirements for the first part of Tinto's (1975) model.

To obtain information for the second part of the model, college experiences, a questionnaire was constructed. Containing 11 subscales, the instrument gathered information on extracurricular activities, peer interactions, faculty interactions, academic activities, family interactions, growth and development activities, community activities, personal time, work activities, faculty concern for student development and teaching, an assessment of the student's intellectual development, and the current grade point average.

The questionnaire was given to 3,400 students in the freshman class at the approximate midpoint of their first year. Each of the students participating in the sample met five conditions to reasonably insure for homogeneity within the sample. Approximately 60.7% of the questionnaires were returned, with only 4.9% unusable.

Both sets of data were held until the tenth day of Fall Term 1982. At that time, the sample was subdivided into two groups, returning and nonreturning students, with those who were academically dismissed deleted from the sample. The data were then prepared for analysis using a cross-tabulation with chi-square and discriminant procedures as outlined in Chapter III.

Chapter IV presented the results of the study using both the statistical techniques of discriminant and chi-square. The statistical

package employed for this analysis was the Statistical Analysis System, a software package maintained by the MSU data-processing department. Supporting tables for the results were detailed in this chapter and corresponded to the eight hypotheses. The findings for this study are presented in the following section.

Findings and Interpretation Within the Framework of Tinto's Model

The first two hypotheses of this study were concerned with the effect of precollege characteristics on returning and nonreturning students in the study. Hypotheses 3, 4, 5, and 6 focused on the college experiences of the student and how these influences affected the returning and nonreturning students. Hypothesis 7 sought to delineate the importance of precollege variables in comparison with the measures of the student's collegiate experiences. The final Hypothesis (Hypothesis 8) was concerned with differences due to sex and was examined throughout a review of the previous seven hypotheses. Given the parameters of the study and the limitations inherent in its design, the following findings resulted.

Null Hypothesis 1

Variables selected from the Student Profile Section (SPS) of the American College Test (used to measure precollege characteristics) will not result in a discriminant function distinguishing freshman-year persisters and students who do not return for their second years.

This hypothesis was accepted. Despite the suggested influence of precollege variables (from the chi-square results) and the fact that a statistically significant function could be computed, its practical ability to successfully distinguish between returning and nonreturning students was not found. This finding became readily apparent when the function was examined by the small amount of variance that it explained, the high amount of residual discrimination that remained, and the extremely low degree of association that existed between the function and the two groups of students. Yet the data did reveal significant chi-square results:

1. Returning and nonreturning students were found to be dependent on two variables: high school class rank and decidedness of college major. The probability that these results occurred by chance was found to be 2.5 times in 100 and 1 time in 100, respectively. As supported by previous research, proportionately more returning than nonreturning students ranked in the top quarter of their high school class. Further, and showing even greater significance, a larger percentage of returning students reported being "very" or "fairly sure" of their chosen college major.

Tinto's model would suggest that the returning students in this study were predisposed to academic success during their first year as high school class rank is a direct reflection of high school academic performance. Such academic standing facilitates academic integration in the college environment. Further, decidedness of college major is indicative of the student's initial goal commitment to a college degree. As research in Chapter II pointed out, students who are more

certain of their goals in college have a greater likelihood of persistence than those who are less certain.

2. When the sample was controlled for sex, differences between male and female students were found. For the female student, it was found that a larger percentage of returning than nonreturning women were in the top quarter of their high school class, and the probability that this occurred by chance was 1 in 100. The variable of high school grade point average was also significant but more mixed and did not reveal any consistent pattern. That is, a larger proportion of returning than nonreturning female students had GPA's in the categories of 2.50, 2.75, 2.76, 3.25, 3.33, 3.75, and 4.00. Nonreturning women demonstrated a larger proportion than their returning counterparts in the categories of 3.00, 3.50, and 3.67.

The male students were only dependent on one variable, decidedness of college major. This finding was the most statistically significant ($p = .005$), with a larger percentage of returning men who were "fairly sure" of their chosen major in college and the opposite with more nonreturning male students who were "not sure." Interestingly, none of the men in either group were "very sure" of their intended major. Regardless, this variable directly relates to the notion of goal commitment in Tinto's model and warrants careful consideration due to its significance. The fact that this was not a significant issue for women may support Spady (1970) and Cope and Hannah's (1975) finding that the fulfillment of interpersonal needs is more important for women than men. As will be seen, such a finding did occur.

Null Hypothesis 2

The precollege variables of family income, high school academic performance, and educational expectations (measured by the variables of decidedness of college major, highest degree expected, and expected grade point average in college) will not be found to have the best discriminating power between freshman-year persisters and students who do not return for their second year.

This hypothesis was accepted. Again, despite the suggested influence of precollege variables by the chi-square analysis, a discriminant function with sufficient substantive significance could not be obtained. However, statistically significant functions resulted and surprisingly supported the alternative of Hypothesis 2.

1. Three variables were found to discriminate with more power than the other precollege variables between returning and non-returning students. In order, these were: decidedness of college major (a measure of educational expectations), ACT composite score (an indirect measure of high school academic performance), and family income.

2. For female students the variables of decidedness of college major, estimated first-year college grade point average (both indices of educational expectations), and expected extracurricular involvements in college formed a statistically significant function. Tinto's model would suggest that the women were predisposed to achieving a balance between goal and institutional commitment. The first two variables more clearly related to initial goal commitment, while the

expected involvement in extracurricular activities related to institutional commitment.

3. For the male students, a slightly different configuration resulted. The three variables of family income, ACT composite score, and high school extracurricular involvements formed a statistically significant function between returning and nonreturning men. Unfortunately, the chi-square results did not reveal the directionality of the differences between the groups; therefore, it is more difficult to explain the nature of this finding. However, inasmuch as this function was not substantively significant, such an explanation, even if possible, would prove superficial.

Null Hypothesis 3

Variables measured by the College Experiences Scale II when entered into a discriminant analysis will not form a discriminant function that distinguishes freshman-year persisters from students who do not return for their second year.

Similar to the first hypothesis, a statistically significant discrimination resulted, but the degree of actual separation between returning and nonreturning students was minimal. This hypothesis was also accepted. Yet significant chi-square results occurred and should be examined.

1. The total group was found to be dependent on four variables: extracurricular activities in college, family interactions, intellectual development, and current grade point average. The results of the first variable demonstrated that a "balance" existed in the

number of activities in which the student should engage. It was found that a larger percentage of returning students participated in four to six activities. On the other hand, nonreturning students were found to be either underinvolved (zero to three activities, suggesting a lack of social integration) or overinvolved (seven to nine activities, suggesting social integration occurred to the exclusion of academic integration). A similar balance could also be found on the variable of family interactions. Larger percentages of returning students reported three to four interactions, whereas the nonreturning students reported only one to two interactions (possibly suggesting a lack of family support while in college) or seven to eight interactions (possibly suggesting either too much dependence on the family or too much interference). The variable of intellectual development showed a clear pattern in that a larger proportion of returning students reported being satisfied with their intellectual development than nonreturning students. The same trend existed for the variable of current grade point average. That is, a larger percentage of returning versus nonreturning students reported GPA's in the range of 2.50-4.00.

The profile of the returning student, according to these results, is indicative of a student who has become both socially and academically integrated into the university. That is, the student is more likely to have found an optimal level of extracurricular involvement, to have performed well academically and feels equally good about his/her intellectual growth, and has achieved a satisfactory degree of contact with his/her family.

2. When the sample was controlled for sex, the same four variables that were previously described were significant. In fact, an examination of the tables shows that similar patterns existed between the female students and the total sample, showing the influence of the female students.

3. However, an examination of the findings for men showed their concentration on purely academic variables. A larger proportion of returning male students reported (1) more satisfaction with their intellectual development, (2) greater concern from the faculty for teaching and student development, and (3) grade point averages in the range of 2.50-4.00. The probability that these results occurred by chance was 1 out of 100 for the first two variables and 1 out of 10,000 for the last variable. Clearly, these results portray the male student as academically integrated, with a strong goal commitment to obtaining the degree. Tinto's model would suggest that this student will persist to completion but may transfer to a school where he can achieve greater social integration as well as academic stimulation.

Null Hypothesis 4

Variables measured by the College Experiences Scale II will not be better discriminators between freshman-year persisters and students who do not return for their second year than precollege characteristics.

The stepwise selection summary tables for the College Experiences Scale II and the ACT Student Profile Section were compared. Three statistics that indicate which function is more powerful in its

discriminating ability were examined. The amount of variance accounted for (Partial R^2), the amount of residual discrimination (Wilks' Lambda), and the degree of association between the function and the groups (Canonical Correlation) were used to determine the "best function." However, the differences between the functions were extremely small. As a result, meaningful analysis was not possible and the null hypothesis was accepted. The data did, however, show an interesting trend:

Although no significant results were found that could definitely support college-experience measures or precollege characteristics as the more powerful discriminator of the two functions, there was some suggestion in favor of college-experience measures. It was found that residual discrimination was lower while the canonical correlation was higher for the function composed of measures from the CES II. This finding may point to Tinto's theory, which states the influence of one's experience on the campus is a more powerful determinant of persistence than background characteristics before enrollment.

Null Hypothesis 5

Of the nine variables that correspond to the social-integration dimension of the College Experiences Scale II, extracurricular activities, peer and faculty interactions will not be found to have the best discriminating power between freshman-year persisters and students who do not return for their second year.

The statistical findings of this hypothesis are diluted when the degree of separation produced by the CES II is examined. A statistically significant function did result, however, and the variables that entered the function will be reviewed.

1. It was hypothesized, based on previous research, that the most powerful variables that led to social integration would be extracurricular involvements, contact with peers, and nonclassroom faculty contacts. The results showed that of the nine social-integration variables, extracurricular activities and faculty interactions did produce the best discriminating power over the other seven. Interestingly, peer interactions did not even enter the discriminant function but activity devoted to personal time did. These findings could be explained by the fact that all of the students in this sample lived in campus residence halls where extracurricular involvement is encouraged and, moreover, made convenient. Thus, a majority of peer contact occurs through structured activity which, indicated by the results, may be fulfilling not only a high involvement need but also the social contact. Faculty interaction is also very convenient in the residence-hall setting. Previous research (Terenzini & Pascarella, 1980) has shown the importance of this variable facilitating not only institutional commitment (and therefore persistence) but also academic integration as the faculty member models scholarly behavior. The fact that activities devoted to personal time entered the function may suggest the limitation that residence-hall living imposes on one's opportunity for privacy.

2. Differences were found when the functions were controlled for sex. For female students, the variable of extracurricular activities was accompanied by community involvements and family interactions. Male students, on the other hand, demonstrated a discriminant only with the variables of school activities and activity devoted to personal time. It seems that while both men and women found extracurricular involvements as important, women were clearly more socially oriented through community involvements and family contact. As will be recalled, even the chi-square results demonstrated that social-integration variables were more significant than those indicating academic integration for women. Further, the chi-square findings emphasized the opposite for male students as the most significant variables were academically related.

Null Hypothesis 6

Variables that correspond to the dimension of academic integration will not be better discriminators between freshman-year persisters and students who do not return for their second year than social-integration variables.

As with the other hypotheses, the findings need to be viewed with great caution due to the lack of substantive discrimination produced by the function. However, five variables entered the function through the stepwise procedure and were suggestive of support for the alternative of this hypothesis.

1. For the total group, the findings revealed that the variables of intellectual development and current grade point average were

the first and third items to enter the function. The first scale, intellectual development, was found to be the best discriminator, which indicated that above all the variables measured by the CES II, a student's perception of his/her own development has more influence on persistence than does grade point average. Therefore, it may not merely be the objective number of the grade, but how the student interprets the grade, that is important. Interestingly, the variable of extracurricular activities, indicating social integration, was found between intellectual development and current grade point average. Given the chi-square results in combination with the discriminant function, it could be speculated that returning students have successfully negotiated a balance between social and academic involvement. Tinto (1975) would state that these students are not only the most likely to persist in college but will do so at Michigan State University.

2. The most support for the influence of academic-integration variables over social-integration variables was found for male students. The male returning student was characterized as placing more importance on academic integration due to the clustering of three variables in the discriminant function holding positions one, two, and three out of five. Current grade point average, faculty concern for student development and teaching, and intellectual development provided more discriminating power than social-integration variables. The opposite was found for female students, who showed a greater balance of both social and academic integration. While the academic variable of intellectual development was found to be the most powerful discriminator in the function, the remaining three variables

corresponded to the social-integration dimension for women. Again, previous research by Cope and Hannah (1975), Pantages and Creedon (1978), and Ramist (1981) showed that persistence for women indicated a fulfillment of interpersonal and social needs. However, in this study, the importance of academic needs was also prevalent.

Null Hypothesis 7

The variables of faculty concern for student development and teaching and faculty interactions will not be the most powerful discriminating variables between freshman-year persisters and students who do not return for their second year than any variable measured in the study.

The stepwise discriminant analysis procedure was computed using all the variables measured in the study. Although a statistically significant function resulted with eight variables, the Partial R^2 and Wilks' Lambda disclosed no substantive discrimination between the groups. Further, the statistical finding did not support the alternative, and the null hypothesis was accepted. The statistical significance of the function revealed:

1. The two most powerful variables that entered the discriminant function were intellectual development and current grade point average. Similar to other findings in this study (and support by the chi-square results), both the student's actual academic performance and assessment of his/her intellectual development contributed most to persistence.

2. Differences were again noted by sex with intellectual development and extracurricular activities acting as the two most powerful variables in the discriminant function for women. The variables of current grade point average and expected extracurricular involvements in college were the two most important variables in the discriminant function for male students. Again, neither faculty concern for student development and teaching nor faculty interactions (as suggested by the research, most notably Pascarella & Terenzini, 1980) was found as the most powerfully discriminating variable in this function.

Null Hypothesis 8

Variables that are found in the discriminant functions will not be different when the sample is controlled for sex.

It was found that six of the seven hypotheses did demonstrate differences based on sex. Such findings occurred among the chi-square results and the discriminant functions already described above. In summary:

1. A larger percentage of returning than nonreturning women were found to possess high school grade point averages in the range of 3.25 to 4.00 and came from the top quarter of their high school class. Further, they were found to have achieved an optimal level of extracurricular involvement in college and a balance in the amount of family interaction they engaged in. A larger proportion of returning versus nonreturning women reported college grade point averages in the range of 3.00 to 4.00 and consistent satisfaction with their intellectual development.

Within the framework of Tinto's model, the high school academic achievement for returning women contributed to their initial academic integration. In turn, this integration was confirmed through their college grade point average and satisfaction with intellectual development. Further, their goal commitment was sustained and possibly increased as it positively related to their persistence. The balance of extracurricular involvements and family contacts is indicative of social integration on the campus and supports their institutional commitment toward Michigan State University.

2. A larger percentage of returning than nonreturning men reported greater certainty with respect to their chosen college major. Further, these students felt a greater concern from the faculty with regard to teaching and their development, reported college grade point averages in the range of 2.50 to 4.00, and were consistently more satisfied with their level of intellectual development.

Tinto's model would suggest that male students formed an initially strong goal commitment based on the certainty of their college major before enrollment. This commitment was sustained and intensified as the men reported equally strong academic integration through (1) the concern they felt the faculty demonstrated toward teaching and student development, (2) their academic performance, and (3) the positive assessment of their intellectual growth. In turn, the theorized increase in the students' goal commitment positively affected their persistence. As suggested in the review of Hypothesis 3, Tinto's model would project that male students who became academically but not socially integrated may transfer to another institution where

more of their social needs can be met. As will be recalled, the model stated that persistence at a particular institution is a function of a balance between social and academic integration. Yet, other research clearly supported the finding that academic needs are more paramount for men and the balance between social and academic orientations for this group may be debatable. This study supported such a finding.

Verification of Data Coding and Analysis

The most evident conclusion in this study was that a discriminant function with significant predictive utility could not be derived. While such a finding was expected with respect to the precollege variables, the researcher did expect to find substantive functions for the college-experience measures. Previous research examined in Chapter II strongly suggested that such findings were likely. It should now be asked: Why weren't substantive discriminant functions found? It could be surmised that unanticipated shortcomings and weaknesses in the study led to this result. Therefore, some of the potential problems will be examined.

1. Returning and nonreturning students were miscoded in the data file: The researcher hand-checked the academic records of all nonreturning students to verify their status. Additionally, a random sample of returning-student records was examined. These records were checked against the computer data file to insure accuracy of coding. It is highly doubtful that this error occurred.

2. The computer program incorrectly read the format of the data: Before initiating any computational analysis, a random sample

of student records was printed for review and checked against instructions given in the program. Again, it is doubtful that this error resulted as the program read the information from correct data-field locations.

3. There was an error in the computational program that prevented it from properly computing discriminant functions: While such a flaw is possible, it is not very probable. The Statistical Analysis System has proven to be a highly reliable and accurate statistical package. The programs receive regular maintenance, and before installation they are thoroughly checked. In addition, the package is updated on a predetermined schedule, but again, throughout its multiple use, programming defects have not been known to occur.

4. The test instruments were not sensitive enough measures: This weakness may have had great impact on the study, particularly the College Experiences Scale II. It may be that the instrument did not pursue the appropriate questions for this study or that the reliability of the questionnaire was inadequate. The same issues may also exist for the Student Profile Section of the American College Test. Further, as will be recalled, the CES II subscales were tested for reliability, and a low to moderate amount was found. Yet, even this moderate amount may still not have been enough for the requirements of discriminant analysis.

5. The college experiences of the students were not measured at the right time: The CES II was administered during winter term at approximately the midpoint of the academic year. The timing of this administration was indicated by previous research (Terenzini,

1980) but may have still been inappropriate. It was noted that approximately 35% of the total nonreturning student population from the freshman class left between Fall and Winter Terms and thus were not eligible for this study. It is possible that some valuable information was lost with this group.

6. The wrong variables were measured in this study: Although highly unlikely it is still quite possible that the MSU student is more different than the national literature would suggest. Noel (1978) stated that what causes retention on one campus may cause attrition at another. In the same way, the variables in this study may have been operating differently than what would be expected from research about attrition from other campuses.

7. Tinto's (1975) model did not hold for this group of students at this time: The model emphasizes interaction between the student and the institution as the major determinant of attrition/persistence. However, a university does not exist in a vacuum, and "environmental pulls" external to the institution may have exerted more influence on the students than many conditions internal to the school. An example could be the financial climate of Michigan and resultant inability of many students to afford the college expenses. This variable was not given careful review in this study as research by Jensen (1981), who summarized a large volume of previous studies plus his own, found that financing had little effect on persistence or attrition. Yet, "couldn't afford tuition and fees and not enough financial aid" ranked first and second as reasons for leaving Michigan State University by a sample of all students who were enrolled Spring

Term 1982 and did not re-enroll Fall Term 1982 (Nunn, Rosenthal, & Olsen, 1983). These data were obtained from a survey sent to all nonreturning students and reflect a 33% return rate across all class levels.

Conclusions

While the major conclusion drawn from this study was that the examined variables failed to substantively discriminate between returning and nonreturning freshmen, the fact that the chi-square analysis showed some significant findings should not be entirely dismissed. Additional study of these findings may prove beneficial.

An example of further examination could begin with studying the differences between male and female students. While the results of this study supported the previous literature, this support was somewhat different for the female students. As already discussed, returning female students not only demonstrated social integration, but academic integration as well. It is readily apparent that social needs are no longer dominant in the minds of the female students. Academic needs are clearly becoming more important than previously found.

This study also demonstrated through the chi-square analysis the importance of established goals before college entry. While this variable was predominantly significant for men, it showed that the degree of certainty one has about his/her intended major influences persistence during the first year. This was not an unexpected conclusion and supported previous study, most notably Feters (1972),

Wessell-Engle and Smidtchens (1978), and Hutchinson and Johnson (1980). Perhaps it would be wise to consider a course for academic credit targeted to undecided freshmen to help them clarify their goals and reasons for obtaining a college education. Thus, academic integration could be fostered through the classroom experience, and increased goal commitment might result from the combination of the classroom and course content.

Female students were found to differ on the variables of high school class rank and high school grade point average. These two items indicated that women are no longer coming to the college setting primarily for the fulfillment of interpersonal needs. This becomes even more clear when they are considered in combination with the variables of intellectual development and college grade point average discussed above. Based on Tinto's model, high school grade point average and class rank suggested a predisposition of the returning women toward academic integration. Thus, while this research supported the literature that men and women would cite different reasons for dropping out, it clearly showed a change in the focus of why women may not return for their second year.

This study also demonstrated the usefulness of Tinto's model in explaining the dropout process for nonreturning students as well as the retention of returning students. However, it became clear that the model is far from complete as there are some obvious shortcomings in its ability and need to account for attrition influences that exist outside of the institution.

Recommendations for Further Research

While each research study is designed to answer a predetermined number of questions, throughout the course of the investigation other questions often arise. Additionally, the findings of a study can sometimes raise more questions than provide data upon which conclusions can be drawn. With these two thoughts in mind, the following are submitted as recommendations for further research:

1. The usefulness of an individual's response is often dependent on the effectiveness of the question. In the same way, the quality of a research study's findings rests in large part with the quality of the measurement instruments. Although the variables in this study did not produce the desired discriminants, in view of the chi-square data, these variables should be pursued through more sensitive measures.

2. The "completeness" of Tinto's model should be re-examined. As suggested by the variable of family interactions and issues such as the condition of the Michigan economy, other circumstances external to the institution may negatively impinge on the integration of a student into campus social and academic life. Contextual issues that may "pull" the student from successfully devoting his/her time to campus academic and social life should be examined. While a university cannot hope to control all of the outside influences on a student's life, it may have a greater ability to neutralize the negative impact of some variables than originally thought possible. Such a move on the part of a university campus would be consistent with one of the main

values of higher education--that is, to enable the student to take more control over his/her own life.

3. A significant amount of dropout from the freshman class of 1981 occurred between Fall and Winter Terms. Due to the design of this current study, these students were not sampled. The possibility that these students possess valuable insight into why students do not return to the campus after the onset of their freshman year exists with this group and is recommended for study.

4. Extracurricular activities played a role in the persistence and attrition of female students. Further investigation should include the specific nature of activities that are positively associated with persistence or attrition. Additionally, the decision-making process of students should be examined with respect to both the number and nature of the activities they choose. In this way, potentially negative impacts of the campus can be reduced, and those that promote persistence can be enhanced.

5. The demonstration of faculty concern for student development and teaching was an important variable for male students. Information that isolates specific experiences encountered by students who are both satisfied and dissatisfied with this aspect of their experiences could be potentially helpful. Again, knowing which experiences enhance persistence and which contribute to attrition would allow a department faculty to take greater control over this aspect of university life for students.

6. Further examination needs to be conducted into identifying those students who are not clear or uncertain about their goals

in college. Identification of students who may leave the institution because of this variable would allow corrective action. The key would be early identification and then the availability of programs or activities to assist the student in crystallizing his/her purpose for continued enrollment.

7. Continued and ongoing research into why new students choose not to return for their second year remains critical. Research findings will always be time-bound and require updating. Further, discriminant analysis is a powerful technique for determining the impact that variables are thought to have on persistence/attrition. Other variables not measured but suggested for follow-up (i.e., students' ability to manage college costs) should be pursued in this manner.

Reflections

This study sought to understand better the attrition and persistence of freshman students at Michigan State University. Regardless of the findings and further study stimulated by this examination, some key issues must be kept in clear view: (1) as just suggested, attrition research needs to be ongoing if it is to remain accurate and timely; (2) any study, despite the theory that it employs, may be subject to inherent uncontrollable weaknesses:

To point this out is simply to recognize that current theory cannot do or explain everything. One must make difficult choices as to what is to be explained. Researchers must also decide whether to strive for maximizing a model's ability to statistically account for variation in behaviors or its ability to clearly explain the origins of particular types of disengagement behaviors. Given the limits of current theory,

we should not be surprised or chagrined when our models fail to account for a very large proportion of the statistical variance in measured dropout behaviors. . . . Rather, they were designed to highlight in the clearest explanatory terms specific types of relationships between individuals and institutions that may account for particular types of dropout behaviors. (Tinto, 1982, pp. 688-89)

The main purpose of attrition research also needs to be kept in clear focus; and (3) any action with the ultimate goal of reducing attrition must have the more immediate goal of improved programs and services for students. At a time when the combination of declining financial support and enrollments could cause a potential institutional crisis, one needs to remember the Chinese symbol for this condition and the two engravings that offer thoughtful reflection; one figure represents danger; the other, opportunity. Continued research offers the opportunity for developing increased knowledge and understanding of attrition with the hope that improved programs and services can increase the positive influence of the collegiate experience.

APPENDICES

APPENDIX A

ITEMS SELECTED FROM THE AMERICAN COLLEGE TEST: STUDENT PROFILE SECTION

Precollege Characteristics

Items from: The American College Test--Student Profile Section (ACTSPS)

*Acronyms are the computer variable label

1. Sex
2. High School Grade Point Average (HSGPA)
3. High School Class Rank (Q81)

*My class rank in high school is (was) (If you are not sure, give your best estimate.)

top quarter.....	4
second quarter.....	3
third quarter.....	2
fourth quarter.....	1

4. ACT Composite Score (ACTC)
5. Community Size (NCOM)

*Which of the following best describes the community in which you live?

Farm or open country.....	1
Town or city of:	
less than 500 population.....	2
500-1,999.....	3
2,000-9,999.....	4
10,000-49,999.....	5
50,000-249,999.....	6
250,000-499,999.....	7
500,000-999,999.....	8
More than 1 million.....	9

6. Family Income (NQ59)

*Please estimate as accurately as possible your family's income.
(Indicate total before taxes.)

Less than \$3,000.....	1
\$3,000-\$5,999.....	2
\$6,000-\$7,499.....	3
\$7,500-\$8,999.....	4
\$9,000-\$11,999.....	5
\$12,000-\$14,999.....	6
\$15,000-\$19,999.....	7
\$20,000 and over.....	8
I consider this information confidential.....	9

7. Evaluation of High School Experience (NQ189)

*How adequate do you feel your high school education has been (was)?

Very inadequate..... 1
 Below average..... 2
 Average..... 3
 Good..... 4
 Excellent..... 5

8. High School Extracurricular Activities (EXTRA)

*The following items list student extracurricular activities.

Please answer Y or N to each item on the list.

Yes, I participated in this activity.....Y - 2

No, I did not participate in this activity.....N - 1

Instrumental music (band, orchestra)

Vocal music

Student government

Publications (newspaper, yearbook, literary magazine)

Debate

Departmental clubs (science, math club, etc.)

Dramatics, theater

Religious organizations

Racial or ethnic groups

Intramural athletics

Varsity athletics

Political organizations

Radio-TV

Fraternity, sorority, or other social clubs

Special-interest groups (ski club, sailing club, judo club, card section, drill teams, etc.)

School or community service organizations

9. Decidedness of College Major (CERTAIN)

*How sure are you about your current program of study?

I am very sure..... 3

I am fairly sure..... 2

I am not sure..... 1

10. Highest Degree Expected (NDEGASP)

*What is the highest level of education you expect to complete?

Vocational or technical program (less than two years).....	1
Two-year college degree.....	2
Bachelor's degree.....	3
One or two years of graduate study (MA, MBA, etc.).....	4
Professional-level degree (PhD, MD, LLB, JD, etc.).....	5
Other.....	6

11. Expected Educational College Needs (EXPECT)

*Many colleges offer special assistance for the individual development of students. You may wish to seek such assistance. Please respond Y or N to each item.

Yes, applies to me..... Y - 2
No, does not apply to me..... N - 1

I need help in expressing my ideas in writing
I need help in improving my reading speed and comprehension
I need help in improving my study skills
I need help in improving my mathematical skills

12. Expected First Year GPA in College (NESTGPA)

*I estimate my overall grade point average at the end of my first year in college will be:

0.5 - 0.9 (D- to D).....	1
1.0 - 1.4 (D to C-).....	2
1.5 - 1.9 (C- to C).....	3
2.0 - 2.4 (C to B-).....	4
2.5 - 2.9 (B- to B).....	5
3.0 - 3.4 (B to B+).....	6
3.5 - 4.0 (A- to A).....	7

13. Expected College Extracurricular Involvements (EXPEXT)

*The next items list student activities you may be interested in at college. Please respond Y or N to each item.

Yes, I do plan to participate..... Y - 2
No, I do not plan to participate..... N - 1

Instrumental music
Vocal music
Student government

Publications (newspaper, yearbook, literary magazine)
Debate
Departmental clubs
Dramatics, theater
Religious organizations
Racial or ethnic organizations
Intramural athletics
Varsity athletics
Political organizations
Radio-TV
Fraternity or sorority
Special-interest groups (ski club, sailing club, judo club, card
section, drill teams, etc.)
Campus or community service organizations

APPENDIX B

**QUESTIONNAIRE COVER LETTER AND
COLLEGE EXPERIENCES SCALE II**

MICHIGAN STATE UNIVERSITY

DIVISION OF STUDENT AFFAIRS AND SERVICES
UNIVERSITY HOUSING PROGRAMS
STUDENT SERVICES BUILDING

EAST LANSING • MICHIGAN • 48824

February 22, 1982

Dear Student,

Please do not throw this away! You are being asked (with approximately half of the freshmen class) to participate in a study designed to learn more about the reasons why students choose to return or not return to MSU after their first year. The information you are asked to provide is highly critical to the information-needs of the project and will only take 15 minutes of your time to complete.

"What's in it for me?"..you ask? Various departments within the university continuously seek to better understand the students they serve. With more accurate and precise information about students, they can be in a better position to offer programs and services designed to help students be as successful at MSU as possible. The results of this study will be reported to different university departments, particularly within the Division of Student Affairs and Services, toward that end. Other interested academic and administrative units will also be able to use the results.

"So...what are you asking me to do?" Please carefully read the instructions on the attached questionnaire. You are being asked to complete the questionnaire and to give us permission to review the information you provided to the American College Testing Program (ACT) when you were in high school...this is all you have to do!

"How confidential is this?" **VERY.** The results of this study will be reported in group form only, individual student responses will not be identified nor will they become part of your academic record. Your name and social security number are only needed to access your admission's and registrar's information primarily for the purpose mentioned above. After you have completed the questionnaire, please put this in the attached envelop and seal it. Please return it to your Resident Assistant who will forward it to us. I will be the only person who will open the envelop.

"Do I really have to do this?" Each student's information is needed to make this a successful project. The more students who participate, the more accurate the results will be. However, you are free to not answer the questionnaire if you choose.

Thank you very much for your cooperation and consideration in this project. If you have any additional questions or would simply like to chat about this study, please feel free to call me.

Sincerely,

William J. Latta, Project Director
338 Student Services Building
Phone: 3-3780

Sponsors: Dr. R.L. Featherstone, Professor
Department of College & Univ. Admin.

Mr. James H. Wall, Director
University Housing Programs

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THE COLLEGE EXPERIENCES SCALE II

DEAR STUDENT:

THE FOLLOWING QUESTIONNAIRE WAS DEVELOPED TO LEARN ABOUT YOUR EXPERIENCE AT MICHIGAN STATE UNIVERSITY. THE QUESTIONS THAT FOLLOW ARE BEING ASKED OF A LARGE NUMBER OF MSU STUDENTS. SOME OF YOU WILL BE HIGHLY SUCCESSFUL AT MSU. THE INTENT OF THESE QUESTIONS IS TO DISCOVER HOW SUCH STUDENTS DIFFER FROM THOSE WHO ARE LESS SUCCESSFUL SO THAT SUGGESTIONS CAN BE MADE AND ACTION TAKEN TO IMPROVE SERVICES AND PROGRAMS FOR YOU AND FUTURE STUDENTS. THE ITEMS IN THIS QUESTIONNAIRE ASK ABOUT VARIOUS ASPECTS OF YOUR EXPERIENCES. PLEASE ANSWER EACH QUESTION BY CHECKING 'YES' OR 'NO' UNLESS INSTRUCTED TO DO OTHERWISE. YOU SHOULD OMIT ANY QUESTION THAT YOU FEEL INVADES YOUR PRIVACY OR IS OFFENSIVE TO YOU. ALSO, IT IS REQUESTED THAT THE ANSWERS YOU PROVIDE BE EXAMINED IN RELATION TO OTHER INFORMATION IN YOUR ADMISSION FOLDER AND RECORDS KEPT BY THE ADMISSION'S AND REGISTRAR'S OFFICE. ALL INFORMATION WILL BE KEPT IN STRICT PROFESSIONAL CONFIDENCE AND WILL NOT BE A PART OF YOUR OFFICIAL RECORD; ONLY THOSE DIRECTLY CONNECTED WITH THE PROJECT WILL HAVE ACCESS TO YOUR ANSWERS. ALL REPLIES WILL BE MAINTAINED IN CONFIDENTIAL FILES AND RESULTS WILL BE REPORTED IN GROUP FORM ONLY, INDIVIDUAL ANSWERS WILL NOT BE IDENTIFIED.

I HAVE READ THE ABOVE DESCRIPTION OF THIS PROJECT
AND VOLUNTARILY AGREE TO PARTICIPATE UNDER THE
CONDITIONS IT DESCRIBES.

(PLEASE PRINT YOUR FIRST,) (SOC. SECURITY NUMBER)
MIDDLE INITIAL AND LAST NAME)

.....

HAVE YOU:	YES	NO
1. Studied with other students in your major?	1. _____	_____
2. Attended at least one Department seminar or special lecture?	2. _____	_____
3. Attended at least one meeting of a student club for majors in your department?	3. _____	_____
4. Regularly studied 4 or more hours on the weekend?	4. _____	_____
5. Generally participated in class discussions (if the opportunity was present)?	5. _____	_____
6. Asked a faculty member outside of class to explain something which was unclear to you?	6. _____	_____
7. Made at least three new friendships on this campus?	7. _____	_____
8. Found at least one student you feel very close to?	8. _____	_____
9. Gone out socially with people you've met in your classes?	9. _____	_____
10. Discovered several students whose personalities and styles of life are like yours?	10. _____	_____
HAVE YOU:		
11. Dated someone you really wanted to?	11. _____	_____
12. Felt generally comfortable in your present living situation?	12. _____	_____
13. Had friends confide some of their problems in you?	13. _____	_____
14. Been asked to go places and do things by people you like?	14. _____	_____
15. Maintained friendships with students from various economic backgrounds, races and religions?	15. _____	_____
16. Gone out socially at least three times a week?	16. _____	_____
17. Complimented an instructor if you felt he/she did an exceptionally good job?	17. _____	_____
18. Told an instructor about a complaint you have which you feel is legitimate?	18. _____	_____
19. Tried to see an instructor during office hours?	19. _____	_____
20. Contacted an instructor outside of class (other than during office hours)?	20. _____	_____
HAVE YOU:		
21. Had an instructor fail to show up during regular office hours?	21. _____	_____
22. Had an instructor break an appointment?	22. _____	_____
23. Visited a faculty member in his/her home?	23. _____	_____
24. Had a faculty member call you by name outside of class?	24. _____	_____
25. Sought the advice of an instructor on a matter of personal concern to you?	25. _____	_____
26. Met an instructor who seems sincerely interested in you as an individual?	26. _____	_____
27. Participated in an organized club?	27. _____	_____
28. Held an office in an organized club?	28. _____	_____
29. Participated in varsity or intramural sports as a player, cheerleader or referee?	29. _____	_____
30. Worked on a Student Government Services (hall or campus) committee?	30. _____	_____

*****THE CES II: PG. 2*****

HAVE YOU:	YES	NO
31. Participated in a cultural group (music, drama, etc.)?	31. _____	_____
32. Been actively involved in the activities or governance of your residence hall?	32. _____	_____
33. Regularly attended intercollegiate sports events?	33. _____	_____
34. Attended a university social function (dance, concert, etc.)?	34. _____	_____
35. Been a member of a small group who generally do things together (movies, parties, games, etc.)?	35. _____	_____
36. Gone home at least half of the weekends?	36. _____	_____
37. Had a visit from your parents (or other members of your family)?	37. _____	_____
38. Sought advice of your parents on an important personal decision?	38. _____	_____
39. Felt pressure, intended or not, from your parents to earn good grades?	39. _____	_____
40. Called home at <u>least</u> once a week?	40. _____	_____

HAVE YOU:	YES	NO
41. Received a phone call from your parents at least once a week?	41. _____	_____
42. Been in general agreement with your parents (or family) about most issues?	42. _____	_____
43. Been reminded by your parents that being in college is a good idea?	43. _____	_____
44. Talked to a counselor or another campus resource person about your career plans and goals?	44. _____	_____
45. Talked to a member of the faculty about your career plans and goals?	45. _____	_____
46. Attended a program designed to make you more self aware or a "stronger" person?	46. _____	_____
47. Deliberately sought a new experience just to learn more about yourself?	47. _____	_____
48. Read the "State News" nearly every day?	48. _____	_____
49. Given either time or money to a local civic project (e.g. park, school, hospital)?	49. _____	_____
50. Become acquainted with someone from the community who was not associated with the university?	50. _____	_____

HAVE YOU:	YES	NO
51. Generally been treated with courtesy by E. Lansing merchants and towns-people?	51. _____	_____
52. Tried to be alone for awhile each day?	52. _____	_____
53. Eaten alone, by choice, at least once a week?	53. _____	_____
54. Found yourself daydreaming nearly every day?	54. _____	_____
55. Generally studied alone?	55. _____	_____
56. Taken a long walk or drive by yourself at least once a week?	56. _____	_____
57. PLEASE CHECK BELOW (1, 2, 3, or 4) CONCERNING YOUR WORK STATUS. IF YOU WORK MORE THAN ONE JOB, ONLY MARK THE <u>ONE</u> JOB WHERE YOU SPENT THE MOST HOURS. (DO NOT CHECK MORE THAN ONE ANSWER.)		
A. Worked 4 or more hours a week as a <u>volunteer</u> (no pay)?	1. _____	
B. Worked 4 or more hours a week at a paid job off campus?	2. _____	
C. Worked 4 or more hours a week at a paid job on campus?	3. _____	
D. Did not work?	4. _____	

ANSWER QUESTIONS 58-61 ONLY AS THEY PERTAIN TO THE ONE JOB YOU CHECKED IN THE ABOVE QUESTION. IF YOU CHECKED "DID NOT WORK" SKIP TO QUESTION NUMBER 62.

58. Have you on balance, enjoyed the work you have done?	58. _____	_____
59. Have you on balance, liked the people you worked with (fellow employees)?	59. _____	_____
60. Have you become acquainted with other MSU students (through the job)?	60. _____	_____
61. Have you learned something at work which you think will help you later on?	61. _____	_____

PLEASE CONTINUE TO ANSWER THE FOLLOWING QUESTIONS BY CHECKING 'YES' OR 'NO' WHICHEVER COMES CLOSEST TO YOUR EXPERIENCE ON THIS CAMPUS.

62. Few of the faculty members I have had contact with are generally interested in students.	62. _____	_____
63. Few of the faculty members I have had contact with are generally outstanding or superior teachers.	63. _____	_____
64. Few of the faculty members I have had contact with are willing to spend time outside of class to discuss issues of interest and importance to students.	64. _____	_____
65. Most of the faculty I have had contact with are interested in helping students grow in more than just academic areas.	65. _____	_____
66. Most faculty members I have had contact with are genuinely interested in teaching.	66. _____	_____

THE CES 11: PG. 3

	YES	NO
67. I am satisfied with the extent of my intellectual development since enrolling in this university.	67. _____	_____
68. My academic experience has had a positive influence on my intellectual growth and interest in ideas.	68. _____	_____
69. I am satisfied with my academic experience at this university.	69. _____	_____
70. Few of my courses this year have been intellectually stimulating.	70. _____	_____
71. My interest in ideas and intellectual matters has increased since coming to this university.	71. _____	_____
72. I am more likely to attend a cultural event (for example, a concert, lecture, or art show) now than I was before coming to this university.	72. _____	_____
73. I have performed academically as well as I anticipated I would.	73. _____	_____
74. My current grade point average at Michigan State University is:		
1. (.9 - 1.4)	1. _____	
2. (1.5 - 1.9)	2. _____	
3. (2.0 - 2.4)	3. _____	
4. (2.5 - 2.9)	4. _____	
5. (3.0 - 3.4)	5. _____	
6. (3.5 - 4.0)	6. _____	
75. What is your major program of study?	_____	
	(Please write NP if your are 'No-Preference at this time)	
76. Tuition costs and room & board costs at Michigan State University are: (please check below)		
1. _____ About what I had expected		
2. _____ More than I expected		
3. _____ Did not know what to expect		
77. Tuition costs and room and board costs will be a major factor in whether or not I return to Michigan State University for Fall Term 1982:		
1. _____ Yes		
2. _____ No		

THANK YOU VERY MUCH FOR YOUR TIME AND THE ANSWERS YOU GAVE. BECAUSE THIS IS A STUDY BEING CONDUCTED OVER TIME, RESULTS WILL NOT BE AVAILABLE UNTIL NEXT FALL TERM. HOWEVER, IF YOU WOULD LIKE TO ATTEND A PRESENTATION ABOUT THE RESULTS OF THIS STUDY, PLEASE WATCH FOR PRESENTATION ANNOUNCEMENTS THAT WILL BE POSTED IN YOUR RESIDENCE HALL COMPLEX.

PLEASE PLACE ANY ADDITIONAL COMMENTS YOU WOULD LIKE TO MAKE ABOUT YOUR EXPERIENCES AT MSU IN THE SPACES PROVIDED BELOW.

(Items 1 through 61 used with permission from R.G. Downey, Center for Student Development, Kansas State University. Items 62 through 73 are used with permission from Patrick T. Terenzini, Office of Institutional Research, State University of New York at Albany.)

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