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Persistence of the "undecided": The characteristics and college persistence of students undecided about academic major or career choice

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Persistence of the "Undecided":
The Characteristics and College Persistence
of Students Undecided About Academic Major or Career Choice

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

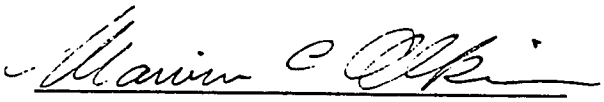
in Education

by

Willard Clark Lewallen

1992

The dissertation of Willard Clark Lewallen is approved.



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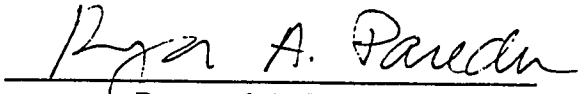

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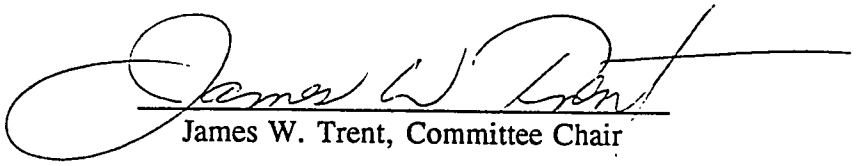

James W. Trent, Committee Chair

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To Michele, Jennifer, Kasey, and Parker
for asking so little and giving so much.

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ABSTRACT OF THE DISSERTATION

Persistence of the "Undecided":

The Characteristics and College Persistence

of Students Undecided About Academic Major or Career Choice

by

Willard Clark Lewallen

Doctor of Philosophy in Education

University of California, Los Angeles, 1992

Professor James W. Trent, Chair

There is a widely held opinion and belief in higher education that students who enter college "undecided" about academic major or career choice are an attrition prone group. However, there is little, and often conflicting, empirical evidence on this issue. Because of this widely held view, this study examined differences between "undecided" and "decided" students and assessed the contribution of being undecided in predicting college student persistence.

Longitudinal data from the Cooperative Institutional Research Program were obtained from over 20,000 college freshmen attending over 300 institutions. These students were surveyed in 1985 and followed up in 1989. "Undecided" and

"decided" students were compared on numerous measures of background and college involvement. These comparisons were made using *t-tests* and *chi-square tests*. In examining the contribution of being undecided in explaining college student persistence, this study used the conceptual framework of college impact theories proposed by Astin, Pascarella, and Tinto. The fundamental premises of Astin's Input-Environment-Outcome (I-E-O) model was used as the research design to guide the analysis. The I-E-O analysis was performed using stepwise multiple regression.

The hypothesis that undecided students would not differ from decided students was not totally supported. Statistically significant differences were found for a number of student background characteristics and measures of student involvement during the college experience. However, most differences were found to be small, but achieved statistical significance due to the large sample size. Generally, it was concluded that undecided students are more similar than different from decided students.

The hypothesis that undecided students are not attrition prone was supported. After accounting for variables previously established as predictors of persistence (student background characteristics, college environment measures, student involvement measures), no measures of being undecided emerged as significant predictors of college student persistence. In addition, the students who entered decided about academic major or career choice did not exhibit any increased chances of persisting. The widely held opinion and belief that undecided students are attrition prone was not supported.

CHAPTER 1

INTRODUCTION AND STATEMENT OF THE PROBLEM

Background

Students undecided about educational and/or vocational goals have been a focus of concern among college administrators, faculty, counselors, academic advisors, and parents for many years. Some view indecision as an unhealthy, worrisome condition. Others see it as a perfectly natural, temporary state. It has been a practice on some campuses to force all new students to choose an academic major upon college entrance. Other colleges and universities have developed special categories or administrative units to initially identify and advise the students who choose not to commit to a specific direction. Some institutions even encourage students to remain undecided during their first year.

Undecided students themselves have mixed feelings. It is not unusual to find some who are positive, flexible, and curious about being undecided. Others are anxious, apologetic, and negative about their status.

Throughout this study several key terms are utilized. The term *undecided* will be used to identify students unwilling, unable, or not prepared to make educational and/or vocational choices. A number of other terms have been utilized to describe this population such as *exploratory*, *open-major*, *undeclared*, *general studies major*,

undetermined, and *special major*. However, the term *undecided*[1] will be used because of its prominent appearance in research and the easy identification with its meaning (Gordon, 1984). Although these terms have been used interchangeably, it should be noted that often there is considerable difference in the meaning and value ascribed to these terms. For example, some students cannot gain admission to a particular academic major at an institution because that major is oversubscribed. Often these students will enter an institution as "undeclared" with the intention of transfer to their intended major when the opportunity arises. These students often get labeled as undecided when in fact they have made a decision. These problems of operational definition and administrative procedures have certainly created interpretive difficulties for the research centering on undecided students. These interpretive difficulties are more fully discussed in Chapter 2, Review of Literature.

The terms *persistence*, *retention*, and *attrition* will be used interchangeably to describe students' behavior with respect to leaving the institution prior to completing educational objectives (*attrition*) or remaining enrolled in the institution (*persistence*, *retention*). The terms *academic major choice* and *educational choice* will be used to describe students' selection of an academic area of study to pursue for degree completion. The terms *career choice*, *occupational choice*, and *vocational choice*

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[1]The term undecided has been operationalized in a variety of ways. In some instances it has been measured by choosing "undecided" from a list of potential majors or careers on an admissions form or survey. At other times it has been determined by a measure of the student's certainty about the choice. Still, at other times, it has been measured by a scale or instrument.

will be used to describe the students' selection of a career or occupation to enter upon completing a college degree.

It is important to understand that undecided students comprise a diverse population. Probably the largest and most obvious group is the traditional-aged freshmen who enter college unable, unready, or unwilling to commit to a specific academic major or career choice. This is the group that will be the subject of this study. Although not the subject of this study there are other identifiable groups of undecided students. While certainly smaller in numbers, another important group is students who reach the junior year (i.e., upper-division students) with no clear career or academic major decision. Other special undecided groups that are often overlooked are adult undecided students, undecided student athletes, and academically underprepared undecided students. One group of students that has received considerable attention consists of students who enter college decided about academic and/or career goals, but then change these choices during their college experience. Some have labeled these students undecided, but it is not clear if this is an appropriate label. Perhaps these students were truly decided upon entering college, but simply modified their choices due to increased awareness and information about other options.

Over the course of focusing attention and research on undecided students, they have come to be labeled as attrition prone, yet there is very little empirical evidence to support this claim. The few studies that have been conducted on the persistence

of undecided students have suspect findings due to methodological problems which are discussed in Chapter 2, Review of Literature. Studies that have tried to attribute persistence behavior to being undecided have fallen short not only because of methodological problems, but also because they have offered little or no theoretical framework for understanding and explaining student persistence behavior. Clearly the explanation of student persistence is highly complex and multi-dimensional. Fortunately, theories and models have been developed that are appropriate for studying the phenomenon of college student persistence (Astin, 1984, 1985; Jacobi, Astin, & Ayala, 1987; Pascarella, 1980, 1985; Tinto, 1975, 1987). These are discussed in Chapter 3, A New Approach.

Although a theoretical basis has been lacking and the empirical evidence suspect due to methodological problems, most student affairs professionals will readily state that undecided students are attrition prone. This opinion is based primarily on anecdotal data derived from being in the trenches working with these students. Unfortunately, opinion and belief are too often used as the basis for retention program development and intervention. The growth of programs and services that target undecided students for retention has been enormous. It is difficult to find an institution that does not deliver some sort of program or services to assist this group. Perhaps it is because these students present such a challenge and require an enormous amount of energy and creativity that they are viewed as attrition prone.

Gordon's (1984) book titled, *The Undecided College Student: An Academic and Career Advising Challenge*, even captures this sentiment.

Indeed, there is a widely accepted opinion and belief that undecided students are attrition prone. This widely held claim can be found in several writings and studies. Statements like the following are typical and have certainly helped fuel this opinion. Gordon (1984) states that one of the key issues involved in discussing the undecided student is that "undecided students have been identified as attrition prone" (p. x). She also states that "college students with unclear, unrealistic, or uncertain academic and vocational goals have been identified in several attrition studies as a dropout prone population" (Gordon, 1985, p. 116). Muskat (1979) suggests that "personal commitment to either an academic or occupational goal is the single most important determinant of college persistence" (p. 20). Sprandel (1985) states:

> A change in career goals was reported by 19% of the students in the study [referencing Astin, 1977] as a reason for not continuing at their institution. While this might indicate that these students had simply lowered their goals and were no longer seeking the same level of education, it could also be the result of a lack of clear career goals and a concomitant lack of any perceived reason for staying in school....students who have not yet identified career options may feel trapped and frustrated and may have little or no commitment to school. (pp. 302-303)

Noel (1985) states:

> Students without specific goals cannot have the same drive that others, moving toward a goal, have. My experience indicates that the second major theme of attrition, uncertainty about what to study, is the most frequent reason talented students give for dropping out of college....students are clearly dropout prone unless they get help with the decision-making process involved in declaring a major. (pp. 11-12)

Perhaps Simms (1983) captures best the view that undecided students are attrition prone when he states the following:

> Although the empirical connection between dropping out and being academically undecided is not entirely clear, it is widely believed that academic indecision is one of the common reasons why students leave college prior to graduation (p. 1). The belief that selecting a major and narrowing a career direction serve as the sorts of symbolic motivators which form a sound basis for the academic success of the student. Without selecting a major and narrowing the career focus, academic success becomes far less likely....The lack of a clear academic and career focus is a causal factor in increased attrition. (pp. 5,14)

The problem with these statements is that some were made with no reference to research that supports the claim. Other statements were made with reference to only one study and often the results from that one study were reinterpreted to somehow support the claim that undecided students are attrition prone. Further, these opinions are driven by the notion that being undecided about academic major or career choice is somehow synonymous with lack of commitment to educational goals. They have confused the construct of commitment to college completion with educational and career choice. "As suggested by a number of researchers, once the individual's ability is taken into account, it is commitment to the goal of college completion that is most influential in determining college persistence" (Tinto, 1975, p. 102). Certainly it is a quantum leap to infer that a student not decided about an academic major or career is not committed to college completion.

Additionally, while this perception of undecided students being attrition prone is widely accepted, another line of inquiry has found few meaningful differences

between decided and undecided students. In numerous studies, these two groups have been compared on a wide variety of background, demographic, and ability measures. The general consensus is that undecided and decided students are more similar than different. As Gordon (1981) has so aptly stated:

> The list of variables studied in relation to educationally and vocationally uncommitted students since the 1930s is all encompassing. Although many of these studies have attempted to determine what makes undecided students different from those who are able to make decisions, the majority found no significant differences. (p. 433)

Additionally, Holland and Holland (1977) have stated:

> Although vocationally undecided students have been assessed in many ways and with a vast range of variables, few clear or compelling differences emerge. Instead the most striking outcomes of these studies are that decided and undecided high school and college students are much more alike than different and that the relatively few differences are conflicting and confusing. (p. 404)

Given that undecided and decided students are considerably alike, it seems odd that the former should have this label of being attrition prone.

The belief that undecided students are attrition prone has become so widespread and generally accepted that it has received national attention. In February of 1992, a national conference was held that focused on undecided students. The title of the conference was "Retention Showcase: Focus on the Undecided Student." The majority of the conference presentations were concerned with strategies and interventions for retaining undecided students. In other words, the general theme was undecided students need to be targeted for retention approaches because they are attrition prone. Another example of national attention given to undecided students

is the *National Academic Advising Association Journal* focusing its spring 1989 issue on the topic of undecided students.

Additionally, opinion and belief can also set the stage for developing critical public policy. Perhaps one of the single strongest examples of targeting undecided students for retention is a piece of California legislation, the Matriculation Act of 1986. This legislation mandates that California Community Colleges give special emphasis to identifying and assisting three groups of students who are considered attrition prone: undecided students, students subject to probation or dismissal, and students in remedial classes. The Matriculation Act has resulted in the expenditure of almost $90 million dollars through 1990-91 and the creation of 798 full-time equivalent positions (Evaluation & Training Institute, 1991). Despite all these efforts and investment of considerable resources, still no light has been shed on the understanding of undecided students and their persistence.

Another interesting phenomenon is that the highest percentage of undecided students have been found in the most selective institutions (Astin, Green, Korn, & Schalit, 1985). This pattern holds for four-year colleges as well as universities and for men as well as women across institutional type. Astin's (1977) longitudinal study of college students found a pattern of predictors that suggest a stereotype of the college persister as a person with high grades in high school, high aspirations, affluent parents, and the ability to postpone gratification. Many students in highly selective institutions fit this stereotypical model of a college persister. Students

exhibiting these characteristics have a high probability of persisting regardless of being undecided. Perhaps these students are undecided because they have more options available due to high academic ability and socioeconomic status.

It is estimated that 20-50% of students entering college are undecided about academic and/or career goals. (Astin, 1977; Berger, 1967; Crites, 1969). Even at the low end of these estimates undecided students can comprise a substantial number of the population of any campus. Because enormous amounts of energy and resources are expended in identifying and trying to retain them, it is important to focus on understanding and explaining undecided student persistence if we are to continue to label them as attrition prone.

Before presenting the goals of the study, some discussion about the study of college student persistence in general is in order. An often unstated assumption in many persistence studies is that persistence is a "good" outcome and dropping out is a "bad" outcome. The personal development benefits as well as the societal benefits that result from a college education are well-documented (e.g., Bowen, 1977; Chickering, 1969; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991). In addition, students invest considerable time and resources into a college education. For these reasons alone, institutions should be concerned about the persistence of their students. However, there are limits. As Tinto (1982) has stated:

> It is not elitist to recognize that not all those who enter are equally equipped either in skills....and/or intellectual capacities to finish a given course of study. Nor are all students with given abilities and skills equally interested in, committed to, and/or motivated to finish

> a course of study once begun...the simple fact is that higher education of any form is not for everyone, even among those who enter the higher educational system....there will always be some portion of entering students who soon discover that higher education is not for them...this is a discovery which is, for a number of students, in their own best interests. (pp. 696-697)

The issue then is not whether persistence is good or bad or whether institutions should strive to reduce dropout. The proper question is which types of students deserve attention in terms of persistence policies and practices. In essence, that is what this study is all about. Should institutions be focusing so much attention and allocating considerable resources toward the retention of undecided students? Should institutions be targeting undecided students as an attrition prone group?

Goals of the Study

As stated earlier, there is a widely held opinion and belief that undecided students are an attrition prone group, yet their is little evidence to support this claim. There is a need to examine fully the impact of being undecided in explaining student persistence. If being undecided turns out to have a negative impact on persistence, then the tremendous amount of energy, effort, and resources allocated in attempting to retain these students appears justified. If being undecided does not have an impact on persistence, then perhaps a thorough review of service priorities, retention programs, and resource allocations appears in order.

Specifically, the goals of the study are:

1. To examine the differences (background characteristics, college involvement measures) between students **undecided** about *academic major* choice and those who are **decided.**
2. To examine the differences (background characteristics, college involvement measures) between students **undecided** about *career* choice and those who are **decided.**
3. To examine the persistence of **undecided** students utilizing a national, longitudinal database and college impact theory.
4. To examine whether being **undecided** contributes anything to the explanation of college student persistence.
5. To dispel or support the widely held belief that **undecided** students are attrition prone.

This study provides nationally relevant information about the understanding and explanation of undecided student persistence. Results from this study will be useful to counselors, advisors, and faculty who must work closely with undecided students. Results will be useful to administrators who are responsible for identifying undecided students and developing programs for their retention. And perhaps, most importantly, the results will be useful to students and their parents who tend to worry considerably about vocational and educational choices.

CHAPTER 2

REVIEW OF THE LITERATURE

College students who are undecided about academic major and/or career goals have been the subject of studies since the 1920s (Crites, 1969). The bulk of the research on undecided students can be classified into three categories: studies that examine the origins of indecision, studies that examine the characteristics of undecided students, and studies that examine programs/treatments to assist students in making decisions. Despite this research attention, there is no general agreement on why students are undecided, the research findings on characteristics of undecided students is at times contradictory, and there is no general agreement on how best to intervene in assisting these students. No wonder, Harman (1973) states that the research on undecided students presents a "confusing picture" (p. 169). For purposes of this study two relevant areas of the literature were reviewed: studies concerning the characteristics of undecided students and studies that examined the persistence/attrition of undecided students.

An exhaustive literature search was undertaken and the sources included: edited book volumes, books, journals, conference proceedings, and unpublished papers. Sources were obtained through ORION, a computer-based bibliographic search tool at the University of California, Los Angeles. Articles and unpublished papers were also found through computer-based technology, using compact disc

searches of works abstracted in education since 1966. Additional sources included personal contacts with authors and leading authorities on the subject of undecided students.

Characteristics of Undecided Students

A great deal of research on undecided students has examined a variety of personal variables and characteristics such as interests, abilities, aptitudes, achievement, family background, risk-taking tendencies, levels of anxiety, and self-identity issues. Many of these studies describe students who are undecided about academic major or career choice when they enter college. Others compare undecided students to decided students on a variety of measures.

Crawford (1929) tested the hypothesis that students with strong educational and vocational orientation would achieve better average college grades than students who were less educationally and vocationally oriented. Educational and vocational orientation were measured by ratings on a qualitative scale for 1,397 college students. The ratings were determined by responses to items on a lengthy questionnaire. The investigator found higher average grades for students with higher ratings of orientation. In addition, he found differences between the groups in mean mental test scores. The correlation between mental test score and grades was highest for the group with the stronger degree of orientation and lowest for the group with the least

degree of orientation. These findings lead the author to the conclusion that "definiteness of occupational purpose tends to improve the quality of a student's academic work" (Crawford, 1929, p. 54).

Williamson (1937) conducted one of the only studies that disputed the general opinion that undecided students achieved at lower levels than decided students. Subjects for his study were 860 freshman in a College of Science, Literature, and the Arts at a public midwestern university. Students were classified into four groups based on the certainty of their vocational choice upon matriculation: very certain, certain, uncertain, and no choice. The groups were compared on high school rank. None of the groups differed significantly in terms of high school rank. The groups were then compared with respect to first quarter college GPA by men and women. Regardless of vocational certainty men did not differ significantly on the measure of GPA. Women with no vocational choice earned higher grades than women with a definite choice. Williamson (1937) concluded that "neither the certainty of a choice nor the possession of a choice appear to be diagnostic of seriousness of educational purpose, and, therefore, predictive of higher scholarship" (p. 356). This conclusion was certainly contrary to the dominant view during this era which held that vocationally undecided students achieved academically less than decided students.

Nelson and Nelson (1940) found a relationship between social, moral, and religious attitudes and vocational choice. Differences were found on a measure of conservativism for students choosing certain occupations. Students selecting

occupations such as banking, dentistry, music, and government service were found to be more conservative than students selecting journalism, social work, law, and agriculture. Undecided students were found to be near the middle of the distribution in terms of conservativism.. Miller (1956) compared the choice of work values among students who were undecided and students who were tentatively or definitely decided. The undecided group were found to emphasize security and prestige. Those who had formulated a choice placed higher value on career satisfaction. Ziller (1957) examined risk-taking tendencies as they apply to vocational decision making. Groups of college sophomores who were decided and undecided about career choice showed significant differences on the risk aspect of the choice process. The lower risk-takers were the undecided group.

Entering freshmen at a large midwestern university were observed across five semesters to determine differences in motivation factors between students who declared a major and those who did not (Chase & Keene, 1981). Motivation was operationally defined as college grade achievement (as reflected in GPA) and the number of cumulative credit hours. Motivation measures were adjusted for differences in prior academic achievement (SAT scores and rank in high school graduating class). The study found that students who declared their major early achieved significantly higher cumulative GPAs and completed significantly more credit hours than students who postponed the declaration of a major. The

investigators concluded that lack of clear academic goals is associated with reduced levels of academic pursuit and motivation.

Freshmen undecided about vocational choice persisting to college graduation were compared with undecided freshmen who left college by the end of their fourth quarter (Rose & Elton, 1971). The sample consisted of males at a midwestern state university. The two groups were compared on measures of personality, ability, and background. Males who withdrew were found to differ from males who persisted to graduation. These differences emerged on two measures from the *Omnibus Personality Inventory*: Nonconformity and Masculine Role. The undecided leavers also had significantly lower ACT Composite scores. There were no differences between the two groups on measures of academic aspiration, family income, college goals, and high school academic achievement. The investigators concluded that "the category 'undecided' ... contains too diverse a population to be described in monolithic terms" (Rose & Elton, 1971, p. 101).

Taylor (1982) investigated the relationships among fear of success, locus of control, ACT test scores, and vocational indecision in college students. Fear of success was measured with the *Fear of Success Scale*. Vocational indecision was assessed with the *Career Decision Scale*. Locus of control was measured with the *Rotter Internal-External Scale*. Results indicated that the vocationally undecided students were more external in their locus of control, were more fearful of success, and achieved lower ACT scores than decided students.

Students in a college of Arts and Sciences were utilized to examine differences between those with a stated academic major and those who were undetermined (Foote, 1980). This study differed from others in a unique way. The measure of students' academic major choice was taken after the students had completed two years of study rather than at the time of initial college entry. The study examined differences between the two groups on the following variables: age, sex, state residency, military veteran status, ethnic group, marital status, high school class rank, and college admission test scores from the American College Testing Program (ACT) or the Scholastic Aptitude Test (SAT). No differences were found for the variables of age, state residency, ethnic group, marital status, or veteran status, high school percentile rank, and SAT entrance scores. Determined students were found to have higher ACT social science scores, higher cumulative grade point averages, and more credit hours completed. In addition, more females were determined about their major than males.

Graduating seniors who were vocationally undecided as freshmen were compared to two other groups of graduating seniors: those whose senior vocational choice was different from their freshman choice and those whose occupational choice remained constant since the freshman year (Elton & Rose, 1971). Freshman occupational choice was the one expressed upon college entrance and senior occupational choice was inferred from the graduation major. No differences were found between the two groups on personality measures from the *Omnibus Personality*

Inventory and no differences were found for academic aptitude as measured by the composite score from the American College Test.

Twining and Twining (1987) examined differences between students undecided about a program of study and students that were decided. A 54-item questionnaire was employed which measured academic, personal, and social needs; specific events that influenced college attendance; and specific reasons for pursuing an education. The results of the analyses suggested considerable similarity between decided and undecided students. The results also revealed that undecided students tended to be older, female students returning as financial means allow and who have specific career and personal counseling needs.

Entering freshmen in thirteen fields of study were compared on demographic characteristics, high school achievement, college selection process, ability to finance college, highest degree planned, academic expectations, career plans, and aspirations (Ruskus & Solmon, 1984). Four representative years of data were selected for the analyses: 1967, 1972, 1975, and 1981. From each of these years, a stratified random sample of approximately 70,000 students was utilized. The thirteen fields of study (i.e., academic major) were English, Language and Literature, Philosophy, humanities, biology, business, education, engineering, physical science, health technology, social science, and "undecided." Across all variables examined "undecided" students were not distinguishable from students who declared an academic major with two exceptions. "Undecided" students and education majors

were the least likely to expect high levels of academic achievement. Predictably, "undecided" students in greatest proportion indicated a very good chance they would change their career choice.

Students at a medium-sized, public comprehensive university were studied to provide a descriptive profile of the undecided student and to compare these students with decided and multiple change students (Anderson, Creamer, & Cross, 1989). The term "undecided" in this study was an administrative term that identified students who have not chosen a major field of study at the time of college entry. Multiple change students were those who initially declared a major, but changed the choice one or more times. Decided students were those who listed a major upon initial enrollment and never changed that selection. These three groups were compared across several variables: gender, race, SAT scores, high school rank, credit hours attempted, credit hours passed, and cumulative college GPA. No significant differences were found in race, gender, SAT scores, or high school rank. The decided students had a higher cumulative GPA than the undecided and multiple change groups. The multiple change students and undecided students attempted and passed more credit hours than the decided group.

Holland and Holland (1977) attempted to "clarify the controversy about the characteristics attributed to students who are decided or undecided about a vocational goal" (p. 404). Samples of 1,005 high school juniors and 692 college juniors were assessed with measures of personality, decision-making ability, interests, and

vocational attitude. Comparisons of undecided and decided students indicated that they were alike on most measures. Significant differences were found only for measures of "sense of identity" and "vocational maturity." In addition, student explanations of indecisiveness formed an internally consistent scale. The findings led the investigators to conclude that "it is more reasonable to assume that most undecided students do not have any special negative characteristics and to treat them accordingly" (p. 413). In addition, they suggest that there "appears to be a need to see undecided students as multiple subtypes who need different personal-vocational treatments" (p. 404).

Baird (1967) conducted comprehensive studies that examined differences between decided and undecided students. To examine specifically the differences between students who had selected a vocational choice and those who had not, he completed two separate studies: one of college freshmen and the other of college-bound high school students. In the first study, 6,289 males and 6,143 females from 31 institutions were surveyed near the end of their freshman year with a comprehensive assessment instrument, the *American College Survey*. The survey included 118 scales and ratings to provide information on student interests, achievements, activities, attitudes, and background. For these students nearing the end of their freshman year, the analyses revealed almost no differences between students who decided upon a vocation at that point and those who had not. The variables did not differentiate the undecided from the decided despite measures from

interest test scales, records of achievement, personality scales, and vocational and educational aspirations.

In the second study, 13,695 students undecided about a vocation were compared with 45,923 who had decided on a vocation. These students completed the American College Testing (ACT) Program battery of tests during their senior year in high school. The ACT battery provided measures of academic aptitude, high school grade point average, and college goals. For these college bound seniors the analyses revealed very little difference between undecided students and decided students on measures of ACT test scores and high school grade point average. The only difference of any size concerned college goals. Undecided students more often than decided students emphasized the college goal of developing their minds and intellectual abilities and less frequently chose the goal of vocational or professional training. These findings led Baird (1967) to the following summarization:

> These studies imply that the undecided student's self-concept is not particularly different from that of other students. His life goals and aspirations, and presumably his self-confidence (also among the self-ratings), are no different from those of other students. He has the same capacities as other students for achievement in both academic and nonacademic areas. (p. 11)

Persistence/Attrition of Undecided Students

The roots of the belief that undecided students are attrition prone run deep and can be traced as far back as the 1920s and 1930s. During this era several studies suggested that vocationally undecided students were more likely to get lower grades than vocationally decided students. In general, these early investigations advocated that vocationally decided students perform academically better than undecided students. Hopkins (1926) believed that vocational counselors needed to assist a student in gaining an understanding of his:

> capacities and interests and the relationship which these things bear to his selection of a life work. With this understanding and the motivating influence that it has on a normal individual, there is some ground for the belief that there comes a scholastic awakening which can be measured even in classroom works. (p. 42)

Kelly (1925) was even more specific when he stated that "the general relationship between the possession of a vocational motive and the doing of diligent work by students is recognized by most college teachers" (p. 73). Williamson (1937) summarized the widely held views of that time and the basic premise behind the belief when he stated the following:

> In casting about for possible explanations of the failure of many high aptitude students to achieve scholastically in terms of their potentiality, one comes upon the suggestion that discrepancies are caused by lack of a definite vocational goal. It is often assumed that students who know, more or less definitely, what they want to get out of college in the way of vocational training work more in line with their capacity and, therefore, get higher grades than do students who are undecided or unoriented vocationally. (p. 353)

During these early years of studying undecided students most educators and student personnel workers assumed that the selection of a definite vocational goal was significantly predictive of scholastic achievement. Vocationally decided students were viewed as more serious in attitudes and work habits and, therefore, would labor diligently to achieve a definite goal. These early studies that examined scholastic achievement of vocationally undecided and decided students helped form the foundation for the current, widely held opinion that undecided students are attrition prone. The study of scholastic achievement and vocational indecision eventually gave way to the study of the persistence/attrition of undecided students.

The research on undecided students has been voluminous in terms of student characteristics, antecedents of indecision, and interventions that target undecided students. However, research on the persistence/attrition of this group has been lacking. It is certainly common practice to label the undecided student as attrition prone, but the simple truth is that very few studies have directly examined the persistence/attrition of undecided students. At a national conference, "Retention Showcase: The Undecided Student," Virginia Gordon was asked about the research literature on undecided student persistence. Gordon is a leading researcher and expert on undecided students (see Gordon, 1981, 1982, 1984, 1985) and coordinates a national clearinghouse for information regarding undecided students. She stated that "the research on the persistence of undecided students has been minimal" and

"the few studies that have been completed have severe methodological problems" (Gordon, 1992).

Male students at a small liberal arts college were studied to determine persistence behavior of those certain about vocational and/or academic goals and those uncertain (Abel, 1966). Students wrote a statement about their vocational and/or academic plans. Four judges evaluated the statements and classified the students either as certain or uncertain about their plans. First year grade point average (GPA) was also collected. Uncertain students with GPAs below 2.00 had a significantly higher attrition rate (75%) than all other students (37%).

Rice (1983) conducted a study to determine the student dropout rate at a southern state university and the characteristics of typical dropout students. The sample for the study was 99% of the students enrolled during the fall 1980. Data were obtained on race, sex, marital status, age, major, day/evening schedule, commuting distance, semester hours attempted and completed, GPA, predicted GPA, aptitude test scores, and admissions classification. Of these students, 68% returned in the spring of 1981 and 42% returned in the fall of 1981. When compared to returning students, nonreturning students were significantly more likely to be readmitted students, to be undecided about their academic major, to attempt fewer semester hours, and to have lower GPA's.

Students in a college of Arts and Sciences were utilized to examine differences between those with a stated academic major and those who were undetermined

(Foote, 1980). This study differed from others in a unique way. The measure of students' academic major choice was taken after the students had completed two years of study rather than at the time of initial college entry. Significantly more determined students remained in school after two years than the undetermined students. Although 60% of the determined group were no longer enrolled, 82% of the undetermined group dropped out.

Withdrawing, nonreturning, and continuing students at an east coast state university were compared in terms of their persistence (Daubman & Johnson, 1982). Withdrawing students were those who dropped out during the fall 1981 semester. Nonreturning students were those who completed the fall 1980 or spring 1981 semester, but did not return for the subsequent semester. Continuing students were those who completed spring 1981 and enrolled in the fall 1981. The authors found more undecided students among the withdrawing group than the nonreturning group or continuing group. In addition, they found more withdrawing students tended to live off campus and left school due to academic difficulties, school-work conflicts, or personal problems. They also found continuing students had considerable interaction with students and faculty outside of class while withdrawing students had little of this kind of interaction.

A survey of trends in expressed educational objectives at a west coast community college revealed that between 1968 and 1973 the percentage of students undecided about educational and career plans increased (City College of San

Francisco, 1975). For the fall of 1974, 37% of all applicants were undecided. The study found that undecided students withdrew during the semester significantly more than students with declared objectives.

Persistence of noncurricular students attending 23 community colleges in the east was examined by Smitherman and Carr (1981). Noncurricular students were those who were undecided about a curriculum or did not wish to pursue a degree. These noncurricular students were tracked for a three year period. The purpose of the study was to determine if race, sex, enrollment status, and final curriculum were related to persistence of noncurricular students. The analyses revealed a statistically significant interaction effect in which race, sex, full-time or part-time attendance, and the final curriculum of a student were related to persistence. In addition, noncurricular students who do not eventually select a curriculum showed the lowest rate of persistence.

Titley and Titley (1980) examined the persistence of three groups of students at a western state university. Students who selected a specific major on the college application form were further asked to rate the certainty of their major choice. Based on responses to a questionnaire statement students were categorized into three groups: uncertain, tentative, and certain about their major choice. After two years, nearly 35% of the uncertain group changed their major choice compared to 17% of the certain group. About 31% of the uncertain group withdrew during the two-year period whereas only 11% of the certain group withdrew. Titley and Titley (1985)

completed a six-year follow-up of these same students. Analyses revealed that the attrition rates of the certain and uncertain groups were not significantly different. The attrition rate for the certain group was 46% compared to 47% for the uncertain group.

Students with declared curricular majors (decided) and those without a declared curriculum (undecided) were compared in terms of persistence rates at a public midwestern college (Wessell, Engle, & Smidchens, 1978). The investigators examined persistence rates for decided and undecided students across four samples: all first-time students, transfer students, first-time students in a College of Arts and Sciences, transfer students in a College of Arts and Sciences. Persistence or withdrawal was assessed one year after college entry. The analyses revealed that undecided students withdrew significantly more than decided students for all groups except one. First-time students in the College of Arts and Sciences who were undecided did not withdraw more than the decided students. The authors concluded that "commitment to a curricular direction gives the student personal support and leads to persistence" (Wessell, Engle & Smidchens, 1978, p. 31).

Muskat (1979) examined the relationship between educational expectations of college freshmen and voluntary college withdrawal and persistence at an eastern, public college. Persistence and withdrawal rates were assessed one year after college entry. Withdrawing students were subdivided into two groups: default and nondefault. Defaulters were those who withdrew in the middle of a semester.

Nondefaulters were those who withdrew at the conclusion of a semester. Persisters were those students who re-enrolled the subsequent year. Defaulter students were less likely than nondefaulters and persisters to have decided on academic and career goals.

As an essential first step in devising a strategy for student retention, Reyes & Withers (1983) conducted a study to develop a profile of high-risk students at an eastern state college. They found that 46% of entering students left the college at the end of the first year of enrollment. By the beginning of the third year, 65% of the original entrants had withdrawn. Common denominators emerged from an analysis over the three-year period. The investigators found that younger students tended to drop out more readily than did older students, that men dropped out more than women, that the majority left during the first two semesters, and that more students without a career goal or major dropped out than did those with more defined objectives.

Condron (1979) conducted perhaps one of the only studies that found undecided students not to be attrition prone. She compared the college graduation rates of students undecided about a college major (n=77) and students decided about a college major (n=102). The sample for the study was all students who had graduated from a private college preparatory boarding school in 1969, 1972, and 1973. All students completed a short questionnaire (12 questions) two to five years after college graduation. It was not known what college or university the respondents

attended. The author found that 90.2% of decided students completed the bachelor's degree and 85.7% of undecided students completed the bachelor's degree. Statistical analyses found no significant difference in the graduation rates of the two groups. The author concluded that "early choice of a college major is not necessary in order to assure graduation" (Condron, 1979, p.25).

Probably the most often cited study when making claims about undecided students being attrition prone is Beal and Noel's (1980) *What Works In Student Retention.* This national survey was conducted to identify, analyze, and compile information about campus action programs and efforts for improving student retention in higher education. Over 900 institutions participated in the survey. While the survey was designed to solicit a wide range of information concerning retention, one aspect focused on "the positive and negative characteristics of institutions that might relate to attrition or retention" (Beal & Noel, 1980, p. 15). The majority of the respondents to the survey were student affairs administrators and academic affairs administrators (e.g., dean of instruction, dean of students). Instructional faculty were not included as respondents to the survey. Respondents were asked to rate factors related to students being dropout prone (on a scale of 1=low to 5=high). Four factors emerged consistently as being the most important in students being dropout prone: low academic achievement (average rating = 4.45), limited educational aspirations (4.09), indecision about major/career goal (3.93), inadequate financial resources (3.65). These findings were not empirically derived from studying

students, but were the result of respondents' opinions, perceptions, and judgements. Unfortunately, this study has been the most influential in establishing the belief that undecided students are an attrition prone group.

Methodological Problems in Studies of Undecided Student Persistence

As we have seen, the literature which examines undecided student persistence/attrition is not very plentiful. Some of these studies did not directly examine undecided students, but rather examined persistence/attrition in general. It is extremely difficult to make generalizations from this research and to conclude that undecided students are attrition prone because of numerous methodological problems.

One of the biggest difficulties in examining undecided student persistence is determining which undecided students to study. Some studies examined students undecided about academic major choice, some examined students undecided about career choice, and some did not make it clear what was meant by undecided student as if there was some universal definition of the undecided student. The identification of undecided students also varied greatly. Some defined undecided students as those who marked this choice from a list of majors/careers on an admissions form or survey. Some utilized a scale or instrument to determine whether students were undecided. Still others categorized students who were not pursuing a degree as undecided.

Another major problem concerns the definition of persistence/attrition. In many instances, persistence was simply completing one semester or year and enrolling in the subsequent term or year. In other cases, persistence was defined as completing a bachelor's degree. Certainly such different conceptions of the outcome variable can produce drastically different results and provides little basis for comparing the results.

Data collection procedures created problems for some studies. Asking respondents to recall whether they were undecided as college freshmen nine years after entering college has potential for creating spurious data. Data, particularly survey data, should be collected at a point in time closest to the occurrence of the event, activity, or condition to ensure greatest reliability. In addition, some that tracked a sample of students from one semester to the next contained freshmen through seniors. In analyzing the persistence/attrition of undecided students, it was not made clear whether these students were undecided at initial college entry or whether they were undecided based on that particular semester's enrollment data.

Without exception, every study involved a single institution and the sample sizes were often extremely small. While single institution studies can be extremely valuable and appropriate, they certainly should not be used as the basis for drawing widely held and generalizable conclusions.

The methodological issues mentioned thus far are important in understanding and interpreting the studies on undecided student persistence. However, by far the

most critical methodological problem involves the design of the studies. In general, these studies employed what Astin (1991) refers to as an "input-outcome" assessment approach to researching the problem (p. 34). Undecided students were identified as such (one input variable - a student characteristic) and were followed up later to determine persistence (outcome variable). Astin categorizes this as an incomplete design because there is no information on the student's experiences while in the college environment. These studies found that high percentages of withdrawing and nonreturning students were undecided. This finding obviously led to the conclusion that undecided students were attrition prone. However, many of these studies also found that withdrawing and nonreturning students experienced academic difficulty, lived off campus, had poor academic preparation, and had little interaction with faculty and students. Despite these additional factors, these studies chose to draw a causal inference that being undecided somehow explained why these students did not persist. Astin's (1975, 1977) comprehensive, longitudinal studies of college students found that good college grades, strong prior academic achievement, dormitory living, and involvement all significantly contribute to persistence. In other words, this type of student has a strong probability of persisting regardless of being undecided. Without taking into account these potentially biasing college student characteristic variables, college environment variables, and student involvement variables found to contribute to persistence it becomes difficult, if not impossible, to determine the impact of being undecided on persistence.

Summary

While the research findings have at times been contradictory, most studies found few, if any, differences between decided and undecided students. In addition, a separate line of inquiry has found multiple subtypes within the undecided population (Holland & Holland, 1977; Jones & Chenery, 1980; Lucas & Epperson, 1986; Lucas & Epperson, 1988). Generally, it has been concluded that undecided students are a heterogenous group and that it is difficult, if not dangerous, to make generalizations about them. Baird (1967) concluded that "it is clear that there are few meaningful differences between decided and undecided students. The similarities, in contrast, are enormous" (p. 14). Gordon (1984) summarized this by stating "overall, the research on undecided students, while voluminous, has yielded little in characterizing this heterogenous group in specific terms" (p. 17). Because few differences have been found between undecided and decided students it appears that undecided students represent more a microcosm of the freshman class than a highly distinguishable group.

While the research on undecided students has been voluminous, very few studies have focused directly on the persistence of undecided students. With two exceptions, all of the studies reviewed found that undecided students were more likely than decided students to withdraw during a semester, not return for a subsequent semester or year, or not persist to bachelor's degree completion. These findings have

certainly contributed to the widely held belief that undecided students are attrition prone. However, the findings have to be viewed skeptically and are not generalizable due to a number of methodological concerns: inadequate sampling, data collection procedures, different definitions of undecided and persistence, single institution studies, and nonlongitudinal design. It appears that the study of undecided student persistence needs an entire reconceptualization.

CHAPTER 3

A NEW APPROACH TO EXAMINING UNDECIDED STUDENT PERSISTENCE

As discussed earlier, studies that have tried to attribute persistence behavior to being undecided have fallen short because of serious methodological problems. These studies also have another tremendous shortcoming. Although these studies have been concerned with examining college student persistence they have offered no theoretical framework for understanding and explaining student persistence. Clearly the explanation of student persistence is a highly complex, multi-dimensional college outcome and to infer that persistence behavior can be explained by a single student characteristic seems unwise. Fortunately, theories and models have been developed that are appropriate for studying the phenomenon of college student persistence. This study will examine the impact of being undecided on persistence through utilization of college impact theories of student change.

College Impact Theory

College impact theories focus on the environmental or sociological origins of change in college students. These models concentrate not so much on any particular internal process or dimension of student change as on the processes and origins of change.

Tinto's Theory of Student Departure

Tinto's (1975, 1986, 1987) theory of student departure was developed to explain the college student attrition process. The model for Tinto's theory is presented in Figure 3.1. Tinto theorizes that students enter higher education with varying patterns of background characteristics and skills, along with initial intentions and inclinations toward college attendance and personal goals. These intentions and commitments become modified and reconstructed during the college years through interactions between the student and the components and members of the academic and social systems of the institution.

> Assuming unchanging external conditions, dropout is taken to be the result of the individual's experiences in the academic and social systems of the college. These experiences lead to varying levels of normative and structural integration in those collegiate systems and to the reevaluation and modification, if need be, of commitments to the goal of college completion and to the institution. (Tinto, 1975, p. 103)

Integration refers to the degree to which the student is congruent with the normative attitudes and values of other members of the institution and goes along with the structural requisites for membership in that community. *Academic* and *social* integration may be a condition (i.e., the student's place in the academic and social systems) or a perception (i.e., the students personal impression of place in the academic and social systems).

Academic integration has two primary components, grade performance and intellectual development. Grades tend to be the most highly visible form of reward in the academic system of the institution. Grades are largely an extrinsic reward for

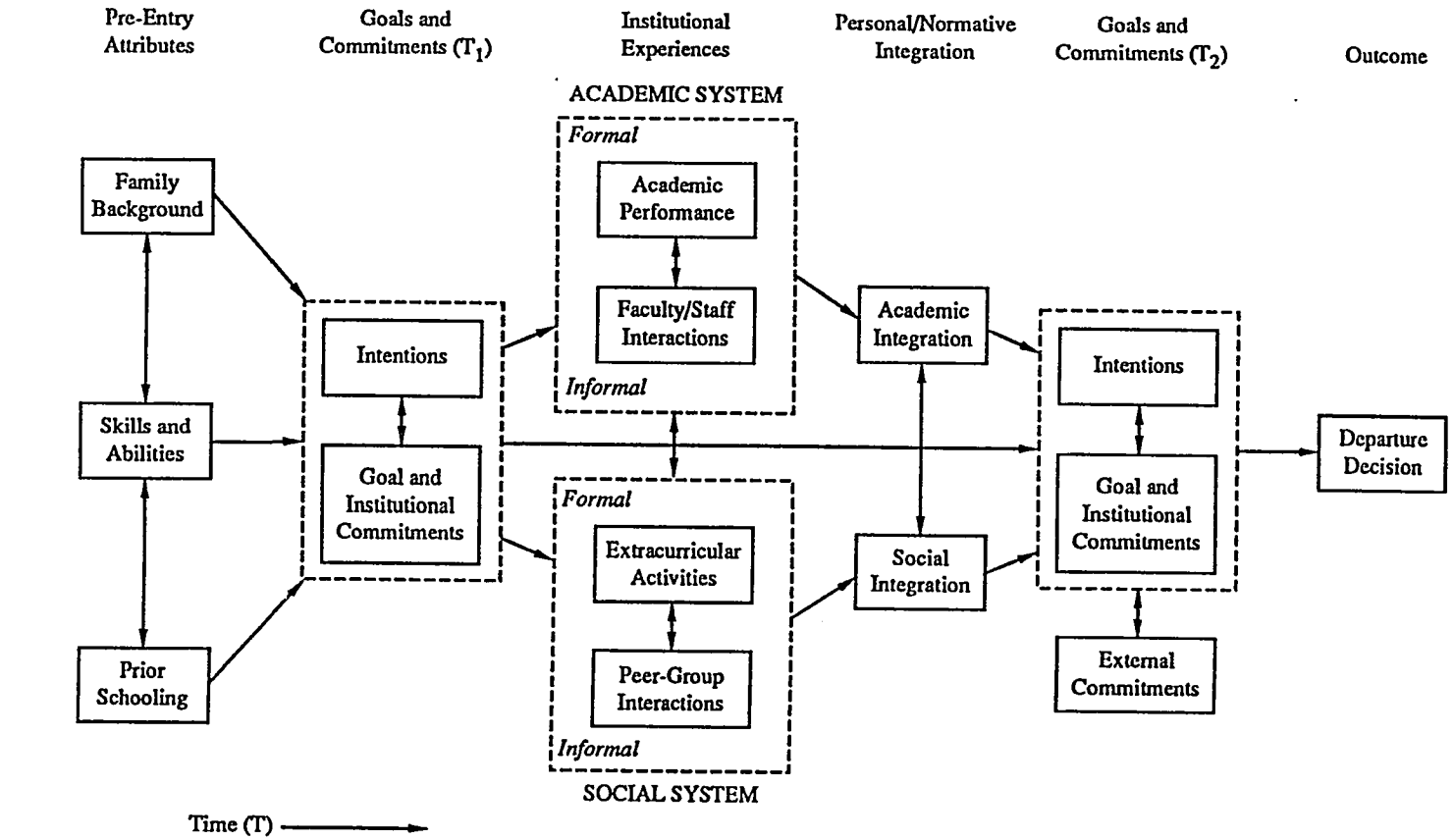

Figure 3.1. A Model of Institutional Departure
Source: Tinto, 1987, p. 114. © by the University of Chicago. Used by permission.

participating in the college - a reward that can be utilized by students as "tangible resources for future educational and career mobility." Grades are seen as "both a reflection of the person's ability and of the institution's preferences for particular styles of academic behavior. With respect to grade performance, many studies have shown it to be the single most important factor in predicting persistence in college." On the other hand, intellectual development tends to be more an intrinsic form of reward and is largely an individual's evaluation of the academic system. Intellectual development is seen as "an integral part of the person's personality development and as a reflection of his intellectual integration into the academic system of the college." Further, intellectual development "has also been found to be related to persistence in college" (p. 105).

Social integration is seen as the interaction between the individual and other persons within the college. Social integration includes peer interactions and relationships, extracurricular participation, and interactions with college faculty and administrative personnel.

> Social integration, as it pertains to persistence in college, seems then, not to imply absolute or even wide-ranging congruence with the prevailing social climate of the institution as much as it does the development, through friendship associations, of sufficient congruency with some part of the social system of the college. (p. 107)

Extracurricular participation can play a role in social integration. These activities are viewed as "a major link to the social and academic systems of the college" providing "both social and academic rewards that heighten the person's commitment to the

institution and therefore reduce the probability of his dropping out from college." Interactions with the faculty and staff of the institution "not only increases social integration and therefore institutional commitment, but also increases the individual's academic integration" (p. 109).

In summary, Tinto's model is longitudinal and seeks to explain the college student attrition process by taking into account student background characteristics, student goals and commitments, and integration into the social and academic systems of the college. Positive experiences with these academic and social systems are presumed to lead to stronger integration with those systems and thus to student retention. Negative experiences act to distance the student from the academic and social systems of the institution and thus reduce integration subsequently leading to dissatisfaction and, ultimately, withdrawal.

Pascarella's General Model for Assessing Change

Drawing on his own work (Pascarella,1980, 1985), as well as that of others (Lacy, 1978; Pace, 1979; Weidman, 1984), Pascarella has put forth a general causal model (see Figure 3.2) that suggests student change (learning and cognitive development) is a result of the direct and indirect effects of five major sets of variables: (1) students' background and precollege characteristics; (2) institution structural and organizational features (e.g., size, selectivity, type); (3) institutional

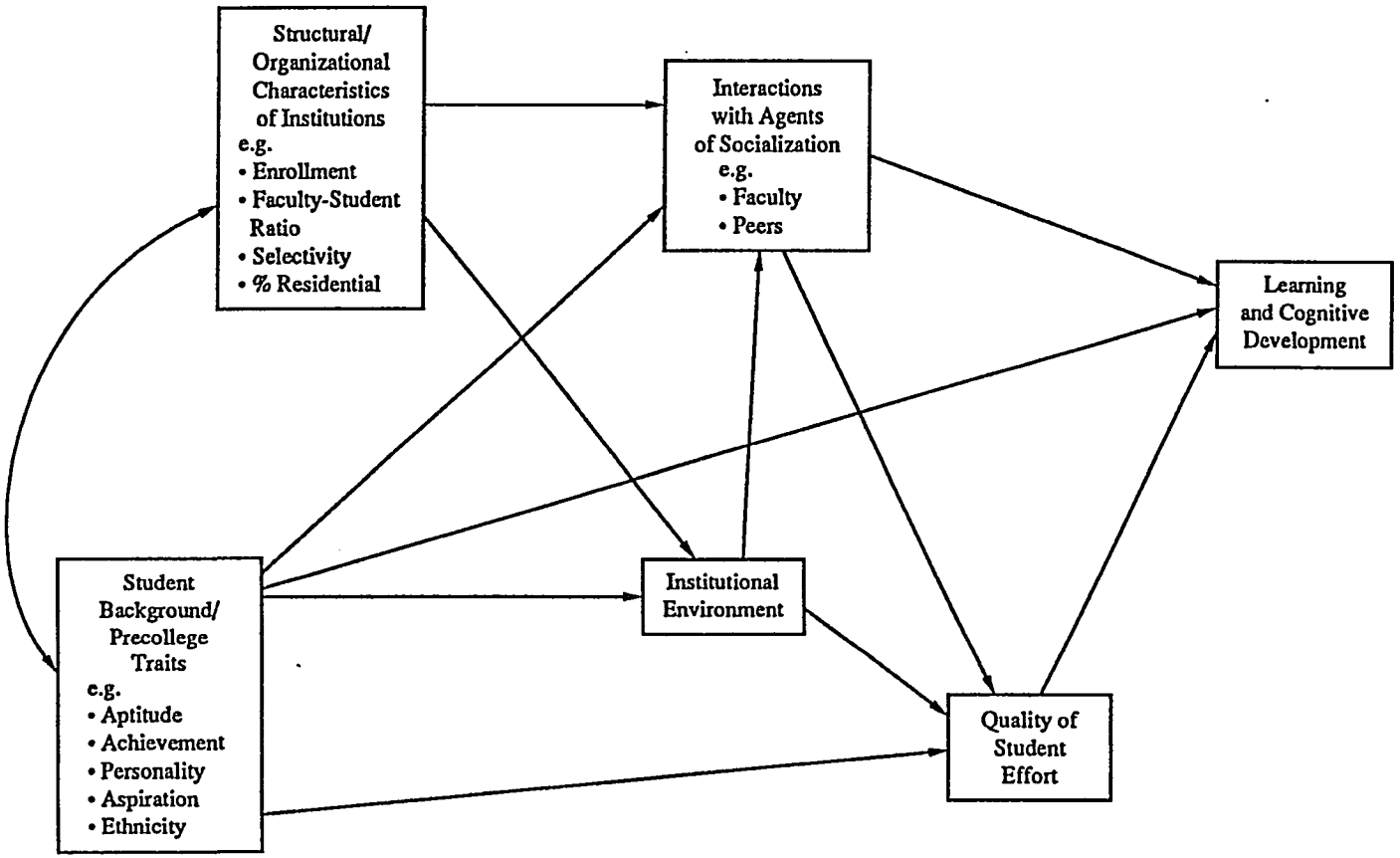

Figure 3.2. A General Causal Model for Assessing the Effects of Differential College Environments on Student Learning and Cognitive Development.
Source: Pascarella, 1985, p. 50. © by Agathon Press. Used by permission.

environment; (4) interactions with faculty and students, and (5) quality of student effort.

A principal purpose of a causal model "is to portray the system of direct and indirect influences in a causal system....it is really an attempt to understand the pattern of causal influences leading to a particular criterion, rather than simply trying to predict that criterion" (Pascarella, 1985, p. 47). Further, "causal modeling also has the advantage of allowing the investigator to estimate the magnitude of indirect as well as direct effects on the criterion" (p. 48). For example, a variable such as student-faculty ratio may not directly affect college outcomes, but may have an indirect influence through interactions with between students and faculty. Student-faculty ratio can certainly shape the nature and frequency of student-faculty interactions. Thus, the influence of student-faculty ratio on college outcomes is indirect because it is mediated through student-faculty interaction. In turn, these student-faculty interactions have a direct influence on the college outcomes.

In Pascarella's theory, the dimensions of the institutional environment are directly influenced by the precollege characteristics which matriculating students bring to the institution and by the institution's structural/organizational characteristics (e.g., size, admission requirements, selectivity, faculty-student ratio, percent residential students). In turn, the institutional environment, student characteristics, and structural characteristics have direct influence on the frequency and nature of interactions with primary socializing agents of the campus (e.g., other students and

faculty members). The quality of student effort is believed to be directly influenced by two sets of variables. Student background traits (e.g., ability, personality, and goals) affects the quality of student effort. At the same time, the press of the dominant environment along with the norms and values of the various campus subcultures with which the student interacts affect the quality of student effort. Ultimately, learning and cognitive development are directly influenced by three sets of variables: student background characteristics, interactions with socializing agents, and quality of student effort. Structural/organizational characteristics and the institutional environment are viewed as not directly affecting learning and cognitive outcomes. The influence of these variables is hypothesized as being indirect, mediated through interactions with socializing agents and the quality of student effort.

Pascarella's theory and model was initially developed to explain changes in students' learning and cognitive development. However, it is equally suited to study other college outcomes including persistence.

Astin's Theory of Involvement

On the basis of his own research (Astin, 1984,1985; Jacobi, Astin, & Ayala) and consistent with Pace's (1984) quality of student effort concept, Astin has put forth a student involvement theory to explain student development and change. The roots of his theory were formed in a "longitudinal study of college dropouts (Astin, 1975) aimed at identifying factors in the college environment that significantly affect

the student's persistence in college. As it turned out, virtually every significant effect could be explained in terms of the involvement concept" (Astin, 1985, p. 144).

Astin contends that what he means by involvement "is neither mysterious nor esoteric. Quite simply, student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience" (p. 134). He suggests there are five basic premises to his theory of involvement:

> (1) Involvement refers to the investment of physical and psychological energy in various "objects." The objects may be highly generalized (the student experience) or highly specific (preparing for a chemistry examination).
>
> (2) Regardless of its object, involvement occurs along a continuum. Different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times.
>
> (3) Involvement has both quantitative and qualitative features.
>
> (4) The amount of student learning and personal development associated with any educational program is directly proportional to the quantity and quality of student involvement in that program.
>
> (5) The effectiveness of any educational policy or practice is related to the capacity of that policy or practice to increase student involvement. (pp. 135-136).

In many ways, the construct of student involvement is similar to a more commonly known construct in psychology, that of motivation. Astin personally prefers the term involvement because:

> it connotes something more than just a psychological state; it connotes the behavioral manifestation of that state. Involvement is more susceptible to direct observation and measurement than is the more abstract psychological construct of motivation. Moreover, involvement seems to be a more useful

> construct for educational practitioners: "How do you motivate students?" is probably a more difficult question to deal with than "How do you get students involved?" (p. 142)

Astin places a heavy emphasis on the role of the institutional environment because it presents students with numerous and varied opportunities for experiences with ideas and people. Change is likely to occur as the student becomes involved in those experiences, but the student must actively take advantage of the environmental opportunities. In other words, student growth and development is largely determined by the student's involvement with the resources (people, ideas, programs, etc.) of the institution.

Astin believes that students learn, develop, succeed, and persist by becoming involved in the educational process. A highly involved student devotes considerable energy to studying, spends a lot of time on campus, participates in campus activities, belongs to student organizations, and interacts frequently with college staff and other students. Conversely, the uninvolved student may neglect academic responsibilities, spend little time on campus, refrain from extracurricular activities, and have little contact with peers and faculty members.

It should be pointed out that there is some question as to whether Astin's propositions constitute a theory. They may not meet generally accepted definitions of theory. Kerlinger (1986) defines a theory as "a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among the variables, with the purpose of explaining and

predicting the phenomena" (p. 9). Based on this definition, Pascarella and Terenzini (1991) have offered the following critique of Astin's "theory":

> Astin offers a general dynamic, a principle, rather than any detailed, systematic description of the behaviors or phenomena being predicted, the variables presumed to influence involvement, the mechanisms by which those variables relate to and influence one another, or the precise manner of the process by which growth or change occurs. It remains to be seen whether Astin's involvement propositions are useful in guiding research beyond providing a general, conceptual orientation. (p. 51)

Similarities Among College Impact Theories

The college impact theories of student change developed by Tinto, Pascarella, and Astin possess several common features or propositions. Although each presents an alternative conception, all place a prominent emphasis on the context in which the student interacts. Although these models differ in specific structural elements and nomenclature, they tend to view persistence as mainly a function of the student's fit or match with the college environment. Institutional characteristics (organization, policies, programs, and services - both academic and nonacademic), along with the attitudes, values and behaviors of the members of the institutional environment, are all potential sources which may impact student persistence. Students are viewed as active participants in their own persistence, but the environment also plays a central role by presenting opportunities for persistence - promoting experiences. In other words, persistence is impacted not only by whether and how the student reacts, but

also by the nature and strength of the environmental stimulus. Most importantly, these college impact theories provide a framework for understanding and explaining the impact of college on student outcomes. While each theory provides a unique contribution, they all contend that student background characteristics before entering the institution (demographics, personal traits, and academic abilities), the institutional environment (structural and organizational characteristics), and student involvement (academic achievement and interactions with the members, programs, and activities of the institution) all play a role in shaping and determining the outcomes of the college experience.

For purposes of this study, college impact theory is an appropriate vehicle for explaining the multiple and complex factors that might influence student persistence. Academic major choice and career choice can be treated as precollege student characteristics that can be evaluated for their contribution to student persistence.

A considerably simpler college persistence model is proposed in Figure 3.3 which is a synthesis of the college impact theories that have been discussed. Precollege student characteristics have the potential to influence persistence (arrow a). These student background characteristics have the potential to influence the type of college a student enters (institutional environment block, arrow b) as well as the types of student experiences while in the college environment (student involvement and academic achievement block, arrow c). Additionally, the institutional environment has the potential to influence students' involvement activities and

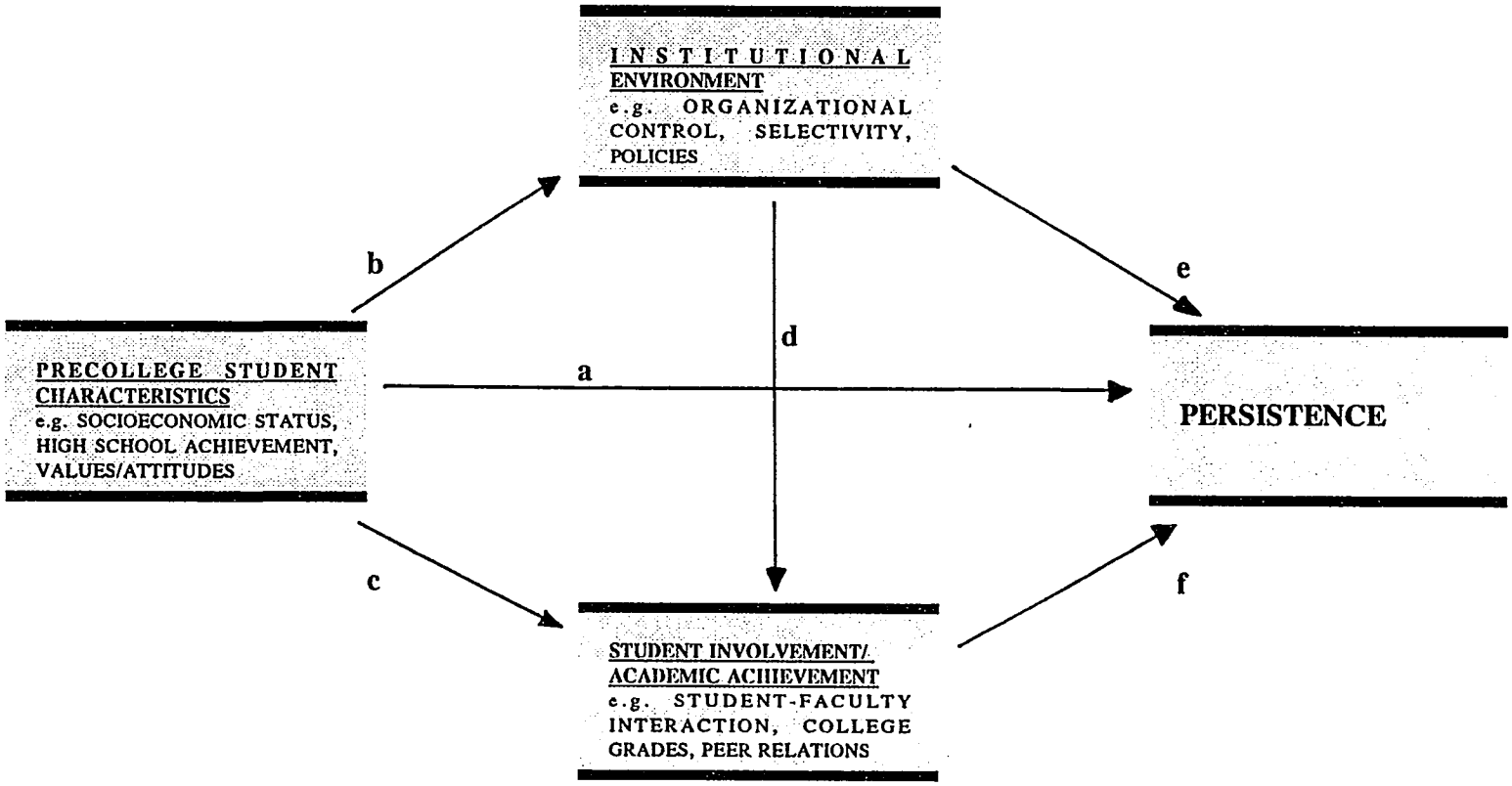

Figure 3.3 A Proposed Model for Understanding and Explaining College Student Persistence

academic achievement (arrow d). In turn, the institutional environment and student involvement/academic achievement can have an effect on college persistence (arrows e and f). However, the order of these influences is not entirely clear. For example, it is widely recognized that student-faculty interaction is a positive contributor to persistence. However, does a student engage in student-faculty interaction as a result of an institutional environment that promotes this activity or is a student predisposed to engage in this type of activity as a result of prior experiences and background? Perhaps, it is a combination of the two. Recognizing the complex dynamics involved in trying to explain persistence, it seems reasonable to suggest that persistence can be the result of various combinations and interactions among these forces and factors regardless of the order of their occurrence. It also seems reasonable to assume that these combinations and interactions can vary considerably among students. Hence, the model is designed to capture the notion that there is considerable interplay among the three sets of variables. The model attempts to make it clear that all of these variables must be taken into consideration when examining persistence. In other words, a single variable or even a limited group of variables is not very useful in trying to comprehend the complexity of college student persistence.

Limitations of College Impact Theory

While college impact theories contribute immensely to the understanding and explanation of student persistence, certainly they have limitations. As Tinto (1982) has stated:

> Despite great expectations, we have yet to move into what Merton refers to as "grand theory." We remain in the middle range where our theoretical models serve to explain only a portion of the wide range of behaviors that constitute the universe of social interactions. This is the case whether we refer to disengagement behaviors in higher education or to their domains of social behavior in or out of schools. (p. 688)

Clearly, variations in student persistence attributable to demographics, background characteristics, the environment, and college experiences have been empirically determined. However, developmental theories and the research based on them suggest that other key student traits may be overlooked if the view is entirely sociological. As Pascarella and Terenzini (1991) have stated:

> sociological models probably give less attention than is warranted to consideration of such student traits as cognitive and emotional readiness for intellectual, academic, or psychological change; to current levels of intellectual curiosity; or to students' capacities for empathy or role playing. At the least, it would appear that the student traits to which attention might profitably be given...should be expanded beyond the current reliance on demographic and background characteristics. (p.58)

To point these issues out is to recognize that current theory is not in a position to explain everything. In choosing what is to be explained, difficult choices often must be made. On the one hand, researchers would like to maximize a model's ability to statistically account for variation in persistence behavior. On the other

hand, researchers would like to clearly explain the origins of particular types of persistence behaviors. Unfortunately, these two goals can be incompatible. For example, including large numbers of variables can greatly increase a model's explanation of variance (Astin, 1971). However, there is often a concomitant loss in the clarity of explanation. Given these limitations, there should be no surprise that these theories often account for a small proportion of the statistical variance in persistence behavior.

To be sure, college impact theories were probably not designed to account for all the potential variations in student persistence behaviors. After all, what other theories can explain the total variation in any human behavior? In general, it appears that these theories were developed to "highlight in the clearest possible explanatory terms specific types of relationships between individuals and institutions that may account for particular types of dropout [persistence] behavior" (Tinto, 1982, p. 689).

Along with the inadequate attention to student developmental issues pointed out earlier, some additional shortcomings should be mentioned. First, present theories do not give sufficient attention to the role of finances in student decisions about persisting. Second, there is inadequate attention given to distinguishing between behaviors associated with institutional transfer and those that result in permanent departure from higher education. As Tinto (1986) has stated, "our current theories of departure, with several notable exceptions, continue to treat all leaving as dropout and therefore as reflective of personal failure" (p. 379). Third, current

theories are not very sensitive to explaining persistence in the two-year college environment. Finally, current theories have been primarily tested through quantitative means. The development of a comprehensive college impact theory will probably remain incomplete until "we carry out similar qualitative studies that explore the experiences of different students (e.g., adult, minority, and part-time) in varying institutions (e.g., two-year and nonresidential)" (Tinto, 1986, p. 300).

These limitations notwithstanding, college impact theory continues to provide a lens through which we can examine the complexities of why students leave or stay in higher education. Clearly, there is much yet to be done in the study of attrition/persistence. In many ways, this study is still in its infancy as we try to increase our understanding of this complex, and often puzzling, phenomenon.

Studies of College Student Persistence/Attrition

The literature concerning persistence/attrition has burgeoned over the last 25 years. Studies on college student persistence/attrition have been conducted at a multitude of institutions, both public and private. Multi- and single-institution research studies examining persistence/attrition have varied with regard to population, data collection, study design, and definition of persistence/attrition. Despite this variability in research approaches, what has emerged is the foregone conclusion that it is impossible to isolate a single variable as responsible for explaining college

student persistence. This research has resulted in considerable empirical evidence regarding variables significantly related to persistence and has been summarized in several key writings such as Pascarella and Terenzini (1991), Feldman and Newcomb (1969), and Pantages and Creedon (1978).

The sheer volume of studies directly or indirectly focusing on persistence/attrition is "extensive to the point of being unmanageable" (Pascarella & Terenzini, 1991, p. 387). In light of this extensiveness and the purposes of this study, the review will be delimited appropriately. The purpose of this review is to support the notion that several variables have consistently been found to be related to persistence/attrition. Therefore, the review will concentrate on studies that have been heavily referenced and regarded in several writings as strong studies. In addition, the majority of the studies utilized a longitudinal design and independent samples.

Research findings have consistently found several variables to be related to college persistence. For purposes of this review and the design of this study, these findings will be grouped into three categories: *precollege student characteristics* (e.g., prior academic achievement, admission test scores, family socioeconomic status), *institutional environment characteristics* (e.g., selectivity, institutional type), and *student involvement measures* (e.g., living arrangements, college academic achievement, student-faculty interactions, peer relationships). Table 3.1 presents a summary of the variables found to be related to persistence and the studies that

support these findings. The specific variables associated with persistence utilized for this study are based on this literature and are fully explained in the methodology section.

The majority of the variables listed in Table 3.1 have been found to be consistently related to persistence. However, two of the variables have encountered mixed results: student racial background and gender. In terms of student gender some studies have found men are more likely to withdraw than women while others have found just the opposite. Still others have found no differences in persistence behavior between men and women. In terms of student racial background there are difficulties also. A simple crosstabulation of persistence by racial background almost always produces the following results: Whites tend to persist more than Blacks or Chicanos and Asian-Americans tend to persist more than all groups. However, in studies that controlled for other precollege characteristics and type of institution, the effects of race on persistence tend to disappear or even reverse. For example, Astin (1975) found that when type of institution was controlled Whites withdrew more than Chicanos in four-year colleges (18% versus 14%). After controlling for socioeconomic status and academic achievement, Peng and Fetters (1978) found blacks more likely to persist than whites.

Conspicuously absent from the table of variables is student age. Age has consistently been found to be related to persistence. However, the cohort for this study is traditional-age college freshmen with little variation in age at the time of

Table 3.1
Findings from Persistence/Attrition Studies

Variables Related to Persistence	*Study Source*
Precollege Student Characteristics	
Gender	(Astin, 1972, 1975, 1977; Demos, 1968; Cope, 1971; Dey & Astin; 1989; Panos & Astin, 1968; Peng & Fetters, 1978; Spady, 1970; Tinto, 1975)
Racial Background	(Astin, 1975, 1977; Dey & Astin, 1989; Peng & Fetters, 1978)
Parental Education	(Astin, 1972, 1975, 1977; Astin & Panos, 1969; Blau and Duncan, 1967; Brazer & David, 1962; Chase, 1970; Cope, 1970; DiMaggio & Mohr, 1985; Duncan, 1968; Eckland, 1965; Gruca, 1988; Hauser, 1973; Iffert, 1958; Jaffe & Adams, 1970; Liebowitz, 1974; Panos & Astin, 1968; Schwartz, 1985; Sewell, Hauser, & Wolf, 1980; Spady, 1971; Tinto, 1981; Trent & Medsker, 1968)
Family Socioeconomic Status	(Astin, 1977; Eckland, 1964; Kowalski, 1977; Lembesis, 1965; McMammon, 1965; Panos & Astin, 1968; Peng & Fetters, 1978; Sewell & Shah, 1967; Trent & Medsker, 1968; Wegner, 1967; Wolford, 1964)
High School Achievement (grades, class rank)	(Astin, 1971, 1972, 1975, 1977; Astin & Panos, 1969; Bayer, 1968; Blanchfield, 1971; Chase, 1970; Coker, 1968; Cope, 1969, 1970; Dey & Astin, 1989; Lavin, 1965; Maudal, Butcher, & Mauger, 1974; Morrisey, 1971; Panos & Astin, 1968; Peng & Fetters, 1978; Slocum, 1956; Summerskill, 1962; Trent & Medsker, 1968)

Table 3.1 - continued

Variables Related to Persistence	*Study Source*
Scholastic Aptitude and Ability (typically SAT or ACT scores)	(Astin 1972, 1973b, 1975, 1977; Cope, 1971; Dey & Astin, 1989; Iffert, 1958; Maudal, Butcher, & Mauger, 1974; Sewell & Shah, 1967; Slocum, 1956; Spady, 1970)
Degree Aspirations	(Astin 1975, 1977; Bucklin & Bucklin, 1970; Coker, 1968; Fetters, 1977; Peng & Fetters, 1978; Sewell & Shah, 1967; Trent & Medsker, 1968)
Commitment to College Completion	(Hackman & Dysinger, 1970; Marcia, 1966; Marks, 1967; Maudal, Butcher, & Mauger, 1970; Rossman & Kirk, 1970; Sewell & Shah, 1967; Spady, 1970; Trent & Medsker, 1968; Trent & Ruyle, 1965)
Institutional Environment Characteristics	
Institutional Selectivity/Quality	(Astin, 1969, 1975, 1977; Anderson, 1984, 1986; Alexander & Eckland, 1977; Ethington & Smart, 1986; Fetters, 1977; Henson, 1980; Kamens, 1971, 1979; McClelland, 1990; Pascarella, Smart, Ethington, & Nettles, 1987; Smart, 1986; Stoecker, Pascarella, & Wolfle, 1988; Tinto, 1980)
Institutional Control	(Astin, 1972, 1975, 1977; Astin & Panos, 1969; Porter, 1989; Smart, 1986; Thomas, 1981)

Table 3.1 - continued

Variables Related to Persistence	*Study Source*
Student Involvement	
Dormitory/On Campus Living	(Anderson, 1981; Astin, 1973a, 1973b, 1975, 1977, 1982, 1985; Chickering, 1974; Herndon, 1984; Pascarella, 1984; Pascarella & Chapman, 1983a; Ryan, 1970; Velez, 1985)
Academic Achievement (college grades)	(Astin, 1971, 1975, 1977; Anderson, 1986; Demitroff, 1974; Ethington & Smart, 1986; Peng & Fetters, 1978; Smart, 1986; Sharp, 1970; Stoecker, Pascarella, & Wolfle, 1988; Tinto, 1981)
Peer Relationships/Extracurricular Involvement	(Astin, 1975, 1977; Carroll, 1988; Dukes & Gaither, 1984; Faughn, 1982; Husband, 1976; Johnson & Chapman, 1980; Kramer, Moss, Taylor, & Hendrix, 1985; Mallinckrodt, 1988; Mallinckrodt & Sedlacek, 1987; Munro, 1981; Nelson, Scott, & Bryan, 1984; Neuman, 1985; Pascarella & Chapman, 1983a, 1983b; Simpson, Baker, & Mellinger, 1980; Vaughan, 1968; Waldo, 1986)
Faculty-Student Interaction	(Astin, 1977; Astin & Panos, 1969; Chickering, 1969; Endo & Harpel, 1979; Pascarella, 1980; Pascarella, Smart, & Ethington, 1986; Pascarella & Terenzini, 1976, 1977, 1979a, 1979b; Stoecker, Pascarella, & Wolfle, 1988; Terenzini & Pascarella, 1978, 1980)

Table 3.1 - continued

Variables Related to Persistence	*Study Source*
Employment During College	(Anderson, 1981; Astin, 1975, 1982; Ehrenberg & Sherman, 1987; Kohen, Nestel, & Karmas, 1978; Peng & Fetters, 1978; Staman, 1980; University of California, 1980; Velez, 1985)

college entry. For this reason, it does not seem appropriate to include age as a variable.

Relationship of College Impact Theory and the Persistence/Attrition Literature to the Purpose of this Study

The review of both the theoretical models developed to understand and explain persistence/attrition behavior among college students at four-year institutions, as well as the institutional studies conducted to examine variables that explain persistence, indicates that college student persistence is clearly not explained by any single variable or any one set of variables or factors. Instead, persistence is better explained as being influenced by past academic preparation and achievement, demographic variables, attitudes, and institutional variables.

It is the investigator's assertion that most studies of undecided student persistence have not attempted to understand the complex and multidimensional phenomenon of college student persistence within a theoretical framework that takes into consideration the relationship between what the student brings to the institution, the characteristics of the institutional environment, and the student's experiences while in the institution. Therefore, it is within this context that this study will attempt to determine if being undecided about academic major choice and/or career choice contributes anything to the explanation of college student persistence.

CHAPTER 4

METHODOLOGY

This study's main objective was to examine the role of being educationally and/or vocationally undecided in contributing to college student persistence utilizing a longitudinal, multi-institutional sample of college students, college impact theory, and multivariate analyses. This section outlines the assumptions underlying the hypotheses, the hypotheses tested, the sample utilized, the data source, definitions of the independent and dependent variables, and the analyses employed in achieving this objective.

Assumptions

Underlying the hypotheses to be tested were these assumptions based on the review of literature concerning undecided students, college impact theory, and the literature concerning college student persistence:

a. Previous research findings on undecided student persistence are inconclusive due to methodological problems and lack of a theoretical framework.

b. Undecided students have been found to be a heterogenous group with characteristics and behaviors more similar than different from decided students.

c. College impact theory provides a model for understanding and explaining college student persistence.

d. College student persistence can be influenced by numerous precollege student characteristics, institutional environment characteristics, and student involvement measures.

e. Academic major choice and career choice are student characteristic variables that, within a college impact model, can be evaluated for their contribution to the explanation of student persistence.

Hypotheses

Based on the assumptions outlined above, the following hypotheses were tested.

Hypothesis 1: Students initially **undecided** about *academic major* choice do not differ significantly from **decided** students on precollege student characteristic measures.

Hypothesis 2: Students initially **undecided** about *academic major* choice do not differ significantly from **decided** students on student involvement measures.

Hypothesis 3: Students initially **undecided** about *career* choice do not differ significantly from **decided** students on precollege student characteristic measures.

Hypothesis 4: Students initially **undecided** about *career* choice do not differ significantly from **decided** students on student involvement measures.

After accounting for precollege student characteristics, institutional environment characteristics, and student involvement measures found to be significantly associated with college student persistence:

Hypothesis 5: Being initially **undecided** about *academic major* choice does not contribute significantly to the explanation of persistence.

Hypothesis 6: Being initially **undecided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 7: Being initially **undecided** about *academic major* choice and **undecided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 8: Being initially **undecided** about *academic major* choice and **decided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 9: Being initially **decided** about *academic major* choice and **undecided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 10: Being initially **decided** about *academic major* choice and **decided** about *career* choice does not contribute significantly to the explanation of persistence.

Data Source

The data source for this study was drawn from data collected as part of the Cooperative Institutional Research Program (CIRP) that is sponsored by the American Council on Education and the Higher Education Research Institute (HERI) at the University of California, Los Angeles. The CIRP is the longest running (25 years) national survey of American college students. The CIRP freshman survey program annually collects a comprehensive array of student background information using the Student Information Form (SIF). Periodically, groups of these entering freshmen are followed-up utilizing the CIRP's Follow-up Survey (FUS).

The freshman SIF and FUS data are very well-suited for the analyses proposed later in this chapter. First, the freshman SIF and FUS data are longitudinal. This design enables the direct measurement of student change and development over time rather than trying to infer it from cross-sectional data. Secondly, these two sources of data are multi-institutional with large numbers of respondents. Collecting data from a diverse set of institutions and students provides an opportunity to examine college impact by representing a wide variation in institutional measures and student measures.

The Student Information Form

The 1985 Student Information Form (SIF) was administered during freshman orientation at most colleges. In some instances the SIF was administered during the first few weeks of fall classes. This survey collected a broad array of information on students' background characteristics, high school experiences, educational and vocational aspirations, attitudinal orientations, and expectations regarding their collegiate careers. A copy of the 1985 Student Information Form is in Appendix A. For the 1985 freshman survey, the CIRP invited 2,741 institutions to participate. Of these, 546 (20%) were able to participate. The participation of these 546 institutions resulted in 279,985 students completing the SIF.

Each year the CIRP creates national norms for measures from the SIF. In creating these national norms, institutions with low response rates (usually below

75%) are excluded. For 1985, survey participants from 181 institutions were excluded from the normative population. This exclusion resulted in 192,453 students at 372 institutions for the national normative population (Astin, Green, Korn, & Schalit, 1985). The institutional type, number of institutions, and number of students utilized for the 1985 CIRP norms are displayed in Table 4.1.

Table 4.1
Number of Participating Institutions and Students by Institutional Type, 1985 CIRP Normative Population (Four-year institutions only)

Institutional Type	*Number of Institutions*	*Number of Students*
Public universities	27	61,994
Private universities	24	21,384
Public four-year colleges	35	25,715
Private nonsectarian colleges	103	32,827
Private denominational colleges	120	30,235
Historically Black colleges	9	2,972
All institutions	*318*	*175,127*

Source: Higher Education Research Institute, University of California, Los Angeles.

The Follow-Up Survey

In 1989, about 95,000 of the students from the 1985 CIRP normative population were selected to receive the 1989 Follow-up Survey (FUS). The FUS collected information on the students' actual collegiate experiences as well as their educational achievements and measures of values and self-esteem. A copy of the 1989 Follow-up Survey can be found in Appendix B.

Participating institutions provided data on students' degree completion and attendance patterns. In addition, admissions test scores (SAT or ACT) were provided directly by the Educational Testing Service and the American College Testing Program.

Three separate samples of students from the 1985 CIRP normative population were sent the 1989 FUS. Since each of these samples were developed for different research purposes, they each deserve some explanation in terms of their characteristics.

HERI random sample. The HERI random sample was drawn from full-time freshman responding to the 1985 SIF using a stratified, random procedure to ensure representation of the different types of higher education institutions. The stratification scheme involved 23 cells reflecting selectivity, control, race, sex, and the type of institution (see Astin et al, 1985). Based on patterns of response observed in earlier FUS studies, a sample of 20,317 was selected from institutions in the CIRP national norms to yield a minimum of 175 respondents in each stratification cell.

The FUS instrument was sent in two mailings. The first mailing occurred in June of 1989. The second mailing went to non-respondents of the first mailing in August of 1989. This sample included 20,317 students attending 348 institutions. Table 4.2 presents response rates by institutional type for the HERI random sample.

Table 4.2
Response Rate by Institutional Type, 1989 Follow-up Survey of 1985 Freshmen, HERI Random Sample

Institutional Type	*Number of Institutions*	*Original N*	*Returned N*	*Response Rate*
Public universities	26	2,824	679	24
Private universities	25	2,244	647	29
Public four-year colleges	35	2,763	615	22
Private nonsectarian colleges	91	2,777	751	27
Private denominational colleges	113	4,191	1,067	25
Two-year colleges	49	3,659	463	13
Historically Black colleges	9	1,859	157	8
All institutions	*348*	*20,317*	*4,379*	*22*

Source: Higher Education Research Institute, University of California, Los Angeles.

Exxon general education sample. The Exxon Foundation sponsored a national study of general education outcomes (see Astin, 1988). In undertaking this study, an additional sample of students was chosen to be followed up from the same cohort (i.e., 1985 freshmen). The students for this sample attended institutions that were selected to participate because of the structure of their undergraduate curriculum. The sampling scheme was designed to maximize variability in four-year institutions in terms of curriculum and institutional characteristics (e.g., size, type, minority enrollment, etc.).

Students in the Exxon sample were mailed FUS instruments in two separate mailings just like the HERI random sample. This sample included 34,323 students attending 52 institutions. Table 4.3 displays response rates by institutional type for the Exxon general education sample.

Table 4.3
Response Rate by Institutional Type, 1989 Follow-up Survey of 1985 Freshmen, Exxon General Education Sample

Institutional Type	*Number of Institutions*	*Original Sample*	*Number of Respondents*	*Percent Returned*
Public universities	8	17,402	4,768	27%
Private universities	4	3,654	1,537	42
Public four-year colleges	4	1,878	459	24
Private nonsectarian colleges	15	5,464	2,195	40
Private denominational colleges	18	4,501	1,546	34
Historically Black colleges	3	1,424	299	21
All institutions	*52*	*34,323*	*10,804*	*31*

Source: Higher Education Research Institute, University of California, Los Angeles.

National Science Foundation sample. The National Science Foundation (NSF) awarded a grant to HERI to conduct an evaluation of undergraduate science education in the United States. The NSF provided the grant to supplement the Exxon Foundation sample. In the Exxon Foundation sample, some types of institutions were

underrepresented (most notably, public four-year institutions). The NSF sample was designed to correct for this underrepresentation.

Students in the NSF sample supplement were sent FUS instruments in a two-wave procedure like the other two samples. This sample included 42,482 students attending 100 institutions. Table 4.4 displays response rates by institutional type for the NSF sample.

Table 4.4
Response Rate by Institutional Type, 1989 Follow-up Survey of 1985 Freshmen, National Science Foundation Sample

Institutional Type	*Number of Institutions*	*Original Sample*	*Number of Respondents*	*Percent Returned*
Public universities	9	7,343	2,164	29%
Private universities	17	11,738	3,875	33
Public four-year colleges	15	9,503	2,853	30
Private nonsectarian colleges	18	7,371	2,387	32
Private denominational colleges	34	5,275	1,579	30
Historically Black colleges	5	1,252	144	12
All institutions	*100*	*42,482*	*13,002*	*31*

Source: Higher Education Research Institute, University of California, Los Angeles.

Final Combined Sample

The final sample for this study was the combination of the HERI random sample, the Exxon Foundation sample, and the NSF sample. These three samples resulted in a longitudinal data file involving a national sample of 27,722 students attending 322 four-year college and universities varying in size, type, and control. All students completed the SIF instrument when they entered college as freshmen in the fall of 1985 and completed the FUS instrument four years later in 1989.

Because bachelor's degree completion or completion of four years of study was the dependent variable in this study, students who did not have bachelor's degree or higher as their original goal upon college entry were not included. Therefore, the sample was defined initially by selecting only those students who aspired to at least a bachelor's degree at the time of college entry. The sample was further defined by excluding two-year college students. Students attending two-year colleges accounted for only about 2% of the total sample and were not very representative of the two-year college population. These further restrictions resulted in a final sample of 26,665 students, reflecting a loss of less than 3% of the cases from the overall sample. Table 4.5 displays the distribution of institutions and number of respondents by institutional type for the final combined sample.

Table 4.5
Final Sample Distribution of Institutions and Numbers of Respondents for Follow-up Survey

		Respondents			
Institutional Type	*N*	*HERI Random Sample*	*Exxon Sample*	*NSF Sample*	*Final Sample*
Public universities	26	679	4,768	2,164	7,611
Private universities	26	647	1,537	3,875	6,059
Public four-year colleges	38	615	459	2,853	3,927
Private nonsectarian colleges	96	751	2,195	2,387	5,333
Private denominational colleges	122	1,067	1,546	1,579	4,192
Historically Black colleges	11	157	299	144	600
All institutions	*322*	*3,916*	*10,804*	*13,002*	*27,722*

Source: Higher Education Research Institute, University of California, Los Angeles.

Dependent Variable

The dependent or outcome variable for this study is a measure of college student persistence. The concept of persistence presents certain definitional problems. The simplest approach is to define as persisters those students who complete a degree program in a specified time period. During the 1960s, among full-time freshmen attending college for the first time, about half earned baccalaureate degrees after four years. This completion rate was similar for freshmen entering in 1966, 1967, and 1968. After five years, degree completion was about 62% (El-Khawas & Bisconti, 1974). More recent studies have found even much lower completion rates. Among full-time freshmen who entered college in 1981 and 1982, about one-third obtained the bachelor's degree four years later (Astin, Green, Korn, Schalit, Dey, & Hurtado, 1988). However, it has also been found that completion rates after five and ten years are 70% and 80%, respectively (El-Khawas & Bisconti, 1974).

Because it is well-documented that a number of students do not complete the bachelor's degree after four years, persistence was not defined only as completing the bachelor's degree after four years. Students who completed four years of study, but did not complete the degree were also considered persisters. Therefore, the outcome (dependent) variable to be predicted in this study consisted of a dichotomous persistence variable: the student completed a bachelor's degree or completed four

years of study (assign score of 2); all others (assign score of 1). This operational definition also allows for the inclusion as persisters those students who completed the bachelor's degree in less than four years.

Independent Variables

Because this study was concerned with determining the contribution of being undecided in explaining persistence, it was important to take into account independent variables that have been shown in previous research to be among the strongest predictors of persistence (as summarized in Chapter 3, Table 3.1). These independent variables were classified (blocked) into four categories: Block 1 - precollege student characteristics, Block 2 - the career choice and academic major choice variables (including their combinations), Block 3 - college environment characteristics, and Block 4 - student involvement measures.

Block 1 - Precollege Student Characteristics

The literature consistently identifies a number of precollege student characteristics that have been found to be related to persistence/attrition (see Chapter 3, Table 3.1). These characteristics were classified as "precollege" because they are traits that the students' possess prior to entering the college environment. These characteristics are a product of the students' upbringing, family background, and

personal attributes. Included in this block are: gender, race, parental educational level, family socioeconomic status, high school grades, high school class rank, SAT scores, degree aspirations, and commitment to college completion. All of these variables were treated as unique independent variables with the exception of commitment to college completion.

The construct of "commitment to college completion" was designed to capture the students' commitment to the goal of obtaining a college degree. Three items from the Student Information form were identified as potential measures for the dimension of commitment to college completion. These measures were students' self-predicted chances of completing a college degree. Responses for each of these items ranged from "no chance" to "very good chance." Since it was impossible to know which of these items were the best measures of the dimension, logic suggested that all of them be included in the analyses. However, this approach can also produce results that are difficult to interpret, especially since the principal goal is to see how these variables are related to the dependent variable (i.e., persistence). Specifically, the potential difficulty with including all of the items is one of highly correlated independent variables. The existence of high multicollinearity can lead to problems in interpretation, stability, and estimation of partial regression coefficients. Since there is no commonly accepted solution to the problem of multicollinearity (Pedhazur, 1982), it is useful to utilize analytical approaches that reduce the possibility of inducing it.

One way to minimize the likelihood of introducing highly correlated independent variables is to search for underlying traits, or *factors*, that explain the correlations among these variables. For example, rather than introducing three measures of commitment to college completion that are related to persistence, it is probably better to use a lesser number of factors in an analysis. This not only diminishes the possibility of multicollinearity, but it can also reduce the measurement error (or unique variance) associated with single questionnaire items.

Following this line of reasoning, factor analysis was employed to explore underlying factors explaining commitment to college completion. Out of numerous techniques available, the principal components extraction method was utilized to extract the factors and the varimax rotation method was utilized to aid in the interpretation of the factor matrix and its loadings (Borders & Abbott, 1988; Cattell, 1952; Kerlinger, 1986). The factor analysis revealed one factor underlying the three self-prediction measures. Table 4.6 presents the factor identified, the loadings for each variable, the eigenvalue, and the amount of variance accounted for. The factor was labeled simply *commitment to college completion* because of the high factor loadings on survey items measuring a student's self-predicted chances of completing a degree: "obtain a bachelor's degree" (.34), "drop out temporarily" (.85), and "drop out permanently" (.87). The commitment to college completion factor produced an eigenvalue of 1.60 and accounted for 53.4% of the variance. Thus, the three separate survey items were reduced to one factor measuring commitment to

college completion. Factor scores were then calculated for each case to be used in subsequent analyses. The factor scores were computed using only those items that produced factor loadings of .30 or higher. This is the generally accepted convention for interpreting the loadings (Bordens & Abbott, 1988; Cattell, 1952; Kerlinger, 1986).

Table 4.7 presents full operational definitions for all Block 1 variables.

Table 4.6
Exploratory Factor Analyses: Factor Loadings for Measures of Self-Predicted Chances of Completing College

	Factor
Measures	*Commitment to College Completion*
Drop Out Permanently	.87
Drop Out Temporarily	.85
Obtain Bachelor's Degree	.34
Eigenvalue	1.60
Percent Variance	53.4

Table 4.7
Precollege Student Characteristics: Block 1 Variable Definitions

Variables	*Definitions*
Gender: Female	A dichotomous measure of student gender coded "1" = male and "2" = female.
Race: White	A dichotomous measure of racial background coded "2" = White and "1" = not White.
Race: Black	A dichotomous measure of racial background coded "2" = Black and "1" = not Black.
Race: Chicano	A dichotomous measure of racial background coded "2" = Chicano and "1" = not Chicano.
Race: Oriental	A dichotomous measure of racial background coded "2" = Oriental and "1" = not Oriental.
Race: American Indian	A dichotomous measure of racial background coded "2" = American Indian and "1" = not American Indian.
Race: Puerto Rican	A dichotomous measure of racial background coded "2" = Puerto Rican and "1" = not Puerto Rican.
Father's Educational Level	A continuous measure of father's educational level (8 levels ranging from "1" = grammar school or less to "8" = graduate degree).
Mother's Educational Level	A continuous measure of mother's educational level (8 levels ranging from "1" = grammar school or less to "8" = graduate degree).
Family Socioeconomic Status	A three-item measure based on the educational levels of the respondent's parents and annual parental income (scores range from 3-30).

Table 4.7 - continued

Variables	*Definitions*
High School Grades	A continuous measure of average high school grades (8 levels ranging from "1" = D to "8" = A or A+).
High School Rank	A continuous measure of academic rank in high school coded "1" = lowest 20%; "2" = fourth 20%; "3" = middle 20%; "4" = second 20%; "5" = highest 20%.
SAT Composite Score	A continuous measure of SAT verbal plus math scores (ranging from 400 to 1600).
Degree Aspiration	A continuous measure of highest degree planned: "1" = bachelor's degree, "2" = master's degree, "3" = Ph.D. / Ed.D. / D.O. / D.D.S. / D.V.M. / J.D. / M.D.
Commitment to College Completion	A factor score that is a continuous measure of commitment to college completion. Each student's score is a result of the factor loadings for the three individual items comprising the factor (see Table 4.6)
<u>Three Survey Items Used to Construct the Commitment to College Completion Factor</u>	
Self-prediction: Obtain bachelor's degree	Coded "1" = no chance, "2" = very little chance, "3" = some chance, "4" = very good chance.
Self-prediction: Drop out temporarily	Coded "4" = no chance, "3" = very little chance, "2" = some chance, "1" = very good chance.
Self-prediction: Drop out permanently	Coded "4" = no chance, "3" = very little chance, "2" = some chance, "1" = very good chance.

Block 2 - Academic Major Choice and Career Choice

The variables of interest in this study, academic major choice and career choice, are also independent variables and were categorized as precollege characteristics since these were student intentions before entering college. In this study, students were labeled undecided or decided based on their response when asked to mark "major field of study" and "career occupation" on the SIF. The selection of undecided students presents certain dilemmas. A student can be undecided about the primary subject to study (i.e., academic major choice), or undecided about the occupational area to enter upon graduation (i.e., career choice). In addition, there are combinations of academic major and career. A student can be decided about one and undecided about the other and at the extreme, a student can be undecided about both. Certainly, all of these possibilities deserve exploration. The design of this study will accommodate the examination of all of these variations of undecidedness through the two main variables (academic major choice, career choice) and the interaction variables that are formed through the combination of these main variables (a 2 X 2 matrix resulting in four possible combinations). Table 4.8 presents these combinations visually to assist in clarifying the combinations of academic major choice and career choice.

Table 4.9 presents full operational definitions for all Block 2 variables.

Table 4.8
Combinations of Academic Major Choice and Career Choice

	Academic Major Choice	
	Decided	*Undecided*
Career Choice		
Decided	Decided Major/ Decided Career	Undecided Major/ Decided Career
Undecided	Decided Major/ Undecided Career	Undecided Major/ Undecided Career

Table 4.9
Academic Major Choice and Career Choice: Block 2 Variable Definitions

Variables	*Definitions*
Undecided: Academic Major Choice	A dichotomous variable coded "2" = *undecided* about academic major choice and "1" = not undecided.
Undecided: Career Choice	A dichotomous variable coded "2" = *undecided* about career choice and "1" = not undecided.
Undecided Academic Major/ Decided Career	A dichotomous variable coded "2" = *undecided* about academic major choice, *decided* about career choice; "1" = all others.
Decided Academic Major/ Undecided Career	A dichotomous variable coded "2" = *decided* about academic major choice, *undecided* about career choice; "1" = all others.
Undecided Academic Major/ Undecided Career	A dichotomous variable coded "2" = *undecided* about academic major choice, *undecided* about career choice; "1" = all others.
Decided Academic Major/ Decided Career	A dichotomous variable coded "2" = *decided* about academic major choice, *decided* about career choice; "1" = all others.

Block 3 - Institutional Environment Characteristics

The literature has consistently shown that some structural/organizational characteristics of higher education institutions are related to persistence/attrition (see Chapter 3, Table 3.1). Included in this block were measures of institutional selectivity and institutional control. Institutional selectivity was defined as the institution's average SAT Composite score for its entering freshman class. It is recognized that there are some problems inherent in this measure of selectivity. Because of affirmative action and other admissions practices, some institution end up with a bimodal distribution of SAT scores. In these cases, the average SAT score can be misleading as an indicator of institutional selectivity. However, this measure has been consistently used in other studies utilizing CIRP data and a similar research design. Therefore, the measure was retained recognizing the limitations.

It is generally agreed that institutions can vary greatly in the way that undecided behavior is treated. Some institutions encourage students to be undecided, some are indifferent, and still others discourage students from entering college undecided. This view toward undecided students, while often not explicitly stated in policy, is often a norm for the institution and permeates the formal and informal practices of the institution. The net effect is that students can get a feel for this norm even before they enter the institution through contact with various members and structures of the institution. It is suggested that this institutional stance on undecided behavior might color students' willingness to declare their undecidedness. In other

words, a student who is truly undecided might not declare this if the institution is viewed as not supportive of undecided behavior. In an attempt to account for these potential differences among institutions, an environmental variable was created as a proxy measure of an institution's view toward undecided students. It was suggested that institutions with high percentages of entering undecided students were more inclined to be supportive of undecided behavior and the opposite was assumed for institutions with a low percentage of undecided students. Therefore, the ratio of entering undecided students to the institution's total freshman enrollment was derived as a measure of the institution's normative view toward undecided students. Table 4.10 presents full operational definitions for all Block 3 variables.

Table 4.10
Institutional Environment Characteristics: Block 3 Variable Definitions

Variables	*Definitions*
Institutional Selectivity	A continuous measure of an institution's average SAT Composite for its entering freshman class.
Control: Private	A dichotomous measure of institutional control coded "2" = private institution and "1" = public institution.
Undecidedness Norm	A continuous measure of an institution's view toward undecidedness calculated as the proportion of students in the freshman class undecided about academic major or career choice.

Block 4 - Student Involvement Measures

The literature consistently identifies a number of student involvement measures that have been shown to be related to persistence/attrition (see Chapter 3, Table 3.1). As discussed earlier in Chapter 3, college impact theory proposes that student involvement plays a critical role in the outcomes of the college experience. Included in this block were measures of: college achievement, peer relations/extracurricular activities, faculty-student interaction, employment status, residential living arrangements, and attendance patterns.

Eight items from the Follow Up Survey were identified as potential measures for the dimension of peer relations/extracurricular activities. Since it was impossible to know which of these items were the best measures of peer relations/extracurricular activities, the same approach was utilized as with the dimension of commitment to college completion. Following the same line of reasoning explained earlier, factor analysis was employed to explore underlying factors explaining peer relations/extracurricular activities. Again, the principal components extraction method and varimax rotation method were utilized. The factor analysis revealed three factors underlying the eight measures of peer relations/extracurricular activities. Table 4.11 presents the factors identified, the loadings for each variable, the eigenvalues, and the amount of variance accounted for. The first factor was labeled *student-student academic involvement* because of the high factor loadings on survey items measuring student-student contact in academic settings: "discussed course

content with students" (.72), "worked on group project for class" (.72), and "tutored another student" (.54). The student-student academic involvement factor produced an eigenvalue of 1.86 and accounted for 23.3% of the variance. The second factor was labeled *student-student social involvement* because of the high factor loadings on survey items measuring student-student interaction in social settings: "member of fraternity/sorority" (.79), "student clubs/groups" (.58), and "participated in intramural sports" (.56). The student-student social involvement factor produced an eigenvalue of 1.19 and accounted for 14.5% of the variance. The third factor was labeled *student leadership/political involvement* because of the high factor loadings on survey items measuring student interaction in leadership and political settings: "in campus protest/demonstration" (.72), "elected to student office" (.64), and "student clubs/groups" (.55). The student leadership/political involvement factor produced an eigenvalue of 1.11 and accounted for 13.9% of the variance.

Thus, the eight separate survey items were reduced to three factors measuring peer relations/extracurricular activities. These three factors accounted for 52% of the variance across the eight survey items. Factor scores were then calculated for each case to be used in subsequent analyses. By generally accepted convention, only items with factor loadings of .30 or higher were used to calculate the factor scores (Bordens & Abbott, 1988; Cattell, 1952; Kerlinger, 1986).

Table 4.11
Exploratory Factor Analyses: Factor Loadings for Measures of Peer Relations/Extracurricular Activities

	Factor		
Measures	*Student-Student Academic Involvement*	*Student-Student Social Involvement*	*Student Leader/Polit Involvement*
Discussed Course Content with Students	.76	-.05	.11
Worked on Group Project for Class	.72	.20	-.15
Tutored Another Student	.54	.04	.21
Member of Fraternity / Sorority	-.08	.79	.02
Student Clubs/Groups	.10	.58	.55
Participated in Intramural Sports	.18	.56	-.04
In Campus Protest/ Demonstration	.02	-.24	.72
Elected to Student Office	.11	.19	.64
Eigenvalue	1.86	1.19	1.11
Percent Variance	23.30	14.90	13.90

Four items from the Follow Up Survey were identified as potential measures for the dimension of student-faculty interaction. Using the same reasoning as outlined previously for the *commitment to college completion* dimension and the *peer relations/extracurricular activities* dimension, factor analysis was employed to explore the underlying factor(s) explaining the student-faculty interaction dimension. The principal components extraction method and varimax rotation method resulted in the identification of one factor. Table 4.12 presents the factor, the factor loadings, the eigenvalue, and the amount of variance accounted for. The one factor was labeled simply *student-faculty interaction* because of the loadings on survey items measuring student-faculty contact in both academic and social settings: "talk with faculty outside of class" (.70), "been guest in professor's home" (.67), "assisted faculty in teaching class" (.62), and "worked on professor's research project" (.53). The student-faculty interaction factor produced an eigenvalue of 1.60 and accounted for 39.9% of the variance. Thus, the four separate survey items were reduced to one factor measuring student-faculty interaction. A factor score was then computed for each case to be used in subsequent analyses. By generally accepted convention, factor scores were calculated using only those items that produced factor loadings of .30 or higher (Bordens & Abbott, 1988; Cattell, 1952; Kerlinger, 1986).

Table 4.13 presents full operational definitions for all Block 4 variables.

Table 4.12
Exploratory Factor Analyses: Factor Loadings for Measures of Student-Faculty Interaction

	Factor
Measures	*Student-Faculty Interaction*
Talk with Faculty Outside Class	.70
Been Guest in Professor's Home	.67
Assisted Faculty Teaching Class	.62
Worked on Professor's Research	.53
Eigenvalue	1.60
Percent Variance	39.9

Table 4.13
Student Involvement Measures: Block 4 Variable Definitions

Variables	*Definitions*
Enrollment: Full-time	A dichotomous measure of student enrollment status coded "2" = was enrolled full-time all four years; "1" = not enrolled full-time all four years.
Living Arrangements: On Campus	A dichotomous measure of college residence coded "2" = lived on campus or in a fraternity/sorority all four years; "1" = did not live on campus or in a fraternity/sorority all four years.
College Grades	A continuous measure of undergraduate college achievement (6 levels ranging from "1" = D or less to "2" = A- or more).
Part-time Job: On Campus	A dichotomous measure of employment while in college coded "2" = held part-time job on campus and"1" = did not have a part-time job on campus.
Part-time Job: Off Campus	A dichotomous measure of employment while in college coded "2" = held part-time job off campus and"1" = did not have a part-time job off campus.
Worked Full-time	A dichotomous measure of employment while in college coded "2" = worked full-time while a student and"1" = did not work full-time while a student.

Table 4.13 - continued

Variables	*Definitions*
Peer Relations/Extracurricular Activities Factors	
Student-Student Academic Involvement	A factor score that is a continuous measure of student-student contact in academic settings. Each student's score is a result of the factor loadings for the eight individual items comprising the factor (see Table 4.11)
Student-Student Social Involvement	A factor score that is a continuous measure of student-student contact in social settings. Each student's score is a result of the factor loadings for the eight individual items comprising the factor (see Table 4.11)
Student Leadership/Political Involvement	A factor score that is a continuous measure of student-student contact in leadership/ political settings. Each student's score is a result of the factor loadings for the eight individual items comprising the factor (see Table 4.11)
Eight Survey Items Used to Construct the Peer Relations/Extracurricular Activities Factors	
Discussed Course Content with Students	A continuous measure of peer relations/extracurricular activity coded "1" = not at all; "2" = occasionally; "3" = frequently.
Worked on Group Project for Class	A continuous measure of peer relations/extracurricular activity coded "1" = not at all; "2" = occasionally; "3" = frequently.

Table 4.13 - continued

Variables	*Definitions*
Tutored Another Student	A continuous measure of peer relations/extracurricular activity coded "1" = not at all; "2" = occasionally; "3" = frequently.
Participated in Intramural Sports	A continuous measure of peer relations/extracurricular activity coded "1" = not at all; "2" = occasionally; "3" = frequently.
Member of fraternity/sorority	A dichotomous measure of peer relations/extracurricular activity coded "2" = was member of fraternity or sorority and "1" = was not member of fraternity or sorority.
Student Clubs/Organizations	A continuous measure of peer relations/extracurricular activity ranging from "1" = no hours per week to "8" = over 20 hours per week.
Enrolled in Honors Program	A dichotomous measure of peer relations/extracurricular activity coded "2" = enrolled in honors or advanced courses and "1" = did not enroll in honors or advanced courses.
Elected to Student Office	A dichotomous measure of peer relations/extracurricular activity coded "2" = was elected to student office and "1" = was not elected to student office.

Table 4.13 - continued

Variables	*Definitions*
Student-Faculty Contact Factor	
Student-Faculty Interaction	A factor score that is a continuous measure of student-faculty interaction in social and academic settings. Each student's score is a result of the factor loadings for the four individual items comprising the factor (see Table 4.12)
Four Survey Items Used to Construct the Student-Faculty Interaction Factor	
Professor's Research	A dichotomous measure of student-faculty interaction coded "2" = worked on professor's research project and "1" = did not work on professor's research project.
Assist Faculty Teaching	A dichotomous measure of student-faculty interaction coded "2" = did assist faculty in teaching a course and "1" = did not assist faculty in teaching a course.
Talk with Faculty Outside of Class	A continuous measure of faculty -student interaction ranging from "1" = no hours per week to "8" = over 20 hours per week.
Been Guest in Professor's Home	A continuous measure of student -faculty interaction coded "1" = not at all; "2" = occasionally; "3" = frequently.

Analyses

Means, standard deviations, and frequencies were calculated to determine the characteristics of the sample and the distributions of the variables. Pearson correlations were used to determine relationships among the variables.

The first set of analyses tested hypotheses 1 through 4 which examine differences between undecided students and decided students. To examine these differences, two statistical methods were employed. For variables that were measured with nominal data, the Chi-square test of significance was utilized. For variables that were measured with interval or ratio data, the t-test of significance was utilized. Because of the large number of cases in the sample a probability level of $p=.001$ was utilized for statistical significance.

The second set of analyses tested hypotheses 5 through 10 to determine the contribution of being undecided in explaining persistence. The conceptual model guiding these analyses was drawn from the work of Astin as outlined in his recent book *Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education* (Astin, 1991) and presented in earlier writings (Astin, 1970a, 1970b). For about the last 20 years, Astin has been using what he calls the input-environment-outcome (I-E-O) model as a conceptual framework to guide assessment activities in higher education. Astin is convinced that any educational assessment project is incomplete unless it includes data on student inputs,

student outcomes, and the educational environment to which the student is exposed. *Outcomes,* refers to the results that are being sought through the educational process; *inputs* refers to the personal characteristics the student brings to the educational process (including the student's level of development at the time of entry); and the *environment* refers to both the structural elements of the institution and the student's experiences during the educational process. Figure 4.1 depicts the relationships among the three types of variables.

Assessment and evaluation in education are mainly concerned with the effects of environmental treatments on outcome variables (arrow B). However, this relationship cannot be fully understood without taking into account student inputs. These student inputs can be related to both outcomes (arrow C) and environments (arrow A). Because student inputs are related to both outcomes and environments, the inputs can affect the observed relationship between environments and outcomes. The I-E-O model allows for the control of student input differences to get a less biased estimate of the impact of environments on outcomes. While the I-E-O model is principally designed to evaluate the effects of environmental treatments on college outcomes, the model is also appropriate for understanding and explaining college student persistence behavior.

The possibility of uncontrolled individual attributes influencing results is a concern in all non-experimental research. Educational research is particularly vulnerable to this problem since the American social and educational systems

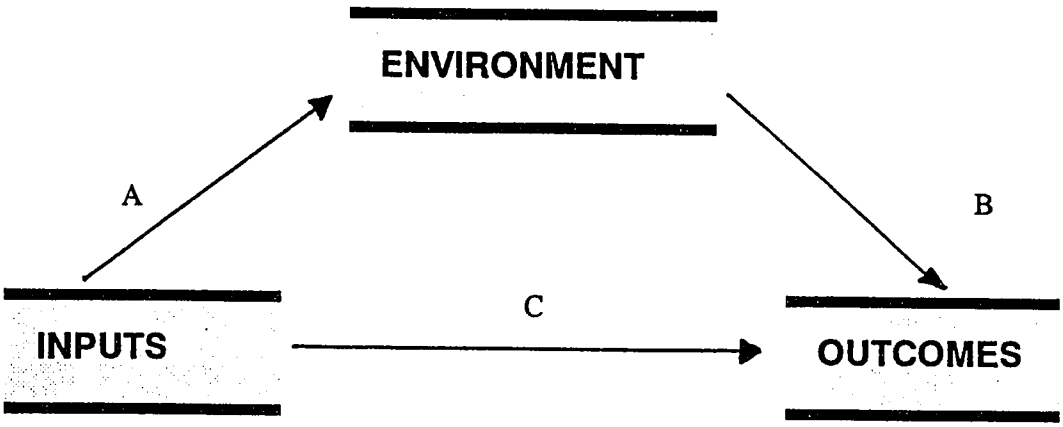

Figure 4.1 The I-E-O Model
Source: Astin, 1991, p. 18. © Macmillan Publishing Company. Used by permission.

distribute students to different educational settings in ways that are far from random. To reduce the possibility that this non-random allocation of students will affect our inferences, it is necessary to control for differences in the characteristics of students upon college entry (see Astin, 1977; Feldman, 1970).

In this study, a number of precollege characteristics may contribute to persistence. For example, previous research has shown that college GPA (environment) is a strong predictor of persistence (outcome). In addition, high school GPA (input) has been shown to be a strong predictor of persistence (outcome). At the same time, high school GPA and college GPA are highly correlated. By controlling for the relationship between high school GPA and persistence, a less

biased estimate of the relationship between college GPA and persistence is obtained. In other words, some of the contribution of college GPA in explaining persistence is due to the individual's high school GPA. More generally speaking, while a number of institutional characteristics (environments) and college experiences (environments) have been shown to be related to persistence (outcome), these environmental variables are potentially influenced by the individual characteristics (inputs) the student brings to the institution.

For purposes of this study, the I-E-O model becomes an appropriate framework for trying to assess the impact of being an undecided student on persistence (*outcome*). Characteristics of students before they enter college (*inputs*) that are associated with persistence can be taken into account. In addition, structural characteristics of the institution (*environment*) and student experiences while in the institution (*environment*) that are associated with persistence can be taken into account. Once these input and environment variables associated with persistence are controlled, it becomes possible to determine the contribution of being undecided about career and/or academic major choice in explaining persistence.

In order to control these potentially biasing independent variables as thoroughly as possible, more than one variable needs to be controlled simultaneously. Multiple regression is a statistical technique that can accomplish this. Multiple regression can determine if the independent variables add anything to the prediction of persistence. Once these independent variables associated with persistence are

controlled, it will be possible to determine if being undecided about career and/or academic major choice adds anything to the prediction of persistence.

The estimation or prediction of persistence in this study was done through multiple regression utilizing the stepwise method. In stepwise regression, the independent variables are added to the regression equation one at a time. Independent variables are added until none of the remaining ones add significantly to the prediction of the dependent variable (persistence).

Stepwise regression yields results that will be very useful in answering the research questions. Each independent variable that is significantly associated with the dependent variable is identified at each step of the regression. The multiple correlation (R) is provided at each step of the regression. When squared, R provides a measure of the total amount of variance in the dependent variable explainable through the independent variables that enter the regression. The simple correlation (r) is provided which shows the relationship between the entering independent variable and the dependent outcome measure (persistence). The beta coefficients (standardized regression coefficients) for the independent variables at each step of the analysis are provided. Beta coefficients can be compared to assess the relative predictive power of each independent variable.

In carrying out multiple regression analyses independent variables must share the variance in explaining the dependent variable. In simple terms it means that independent variables often compete for entering into the regression equation. There

is always a possibility that an independent variable could have a significant simple relationship to the dependent variable, but not emerge in the regression equation as a significant predictor. The statistical software program to be utilized for the multiple regression analyses has the capability of tracking independent variables as they enter and do not enter the regression equation.

In setting up this analysis the independent variables were modeled in blocks according to their known or expected temporal sequencing consistent with Astin's (1991) recommendations. Block 1 consisted of precollege student characteristics. Block 2 consisted of the academic major choice and career choice variables (including their combinations). Block 3 consisted of variables describing the institutional environment the student entered. Block 4 consisted of student involvement measures (intermediate outcomes) that occur subsequent to matriculation to the institution.

Because the sample in this study is so large, a significance level of $p=.001$ was set for variables to enter the regression. In addition, this low significance level was utilized because this study was attempting to reverse a long standing belief that undecided students are attrition prone. In other words, strong evidence was necessary to support or reject the null hypothesis that being undecided does not contribute to the explanation of college student persistence.

Exploratory Analyses

A basic premise of the college impact theories and models is that a good person-environment fit contributes to enhanced college student persistence. It is often assumed that many of the variables that significantly contribute to the explanation of persistence tend to be consistent across institutions. In other words, the variables that lead to good person-environment fit will tend to be consistent across institutions. In this study, which examines thousands of students across hundreds of institutions, there was the potential for the person-environment fit at the institutional level to be "washed-out" in running one multiple regression analysis. In addition, an earlier discussion focused on the idea that institutions can vary tremendously in how they view and treat undecided students. This institutional attitude toward undecided students probably gets lost in performing a single regression analysis across hundreds of institutions. Because of this potential loss and the huge assumption about person-environment fit, some exploratory analyses were performed. Of the institutions in the sample, two colleges with high persistence rates (greater than 70%), two with moderate persistence rates (between 40 and 70%), and two with low persistence rates (less than 40%) were randomly selected for analysis. Separate regressions were performed for each institution regressing the same independent variables as in the overall sample on the dependent persistence variable. These separate regression analyses were then compared to each other as well as to the single regression analysis

for the overall sample. These regressions were carried out in an effort to explore how the independent variables contributed to explaining persistence at different institutions with different persistence rates and potentially varying approaches to dealing with undecided students. A restriction was utilized in choosing the six institutions for exploratory analyses. Only institutions with 200 or more cases in the sample were considered in an effort to increase the likelihood that the students from a given institution were representative of that institution's student population.

CHAPTER 5

RESULTS AND DISCUSSION

The results and discussion from the analyses in this chapter are organized into four primary sections. The first section addresses descriptions and characteristics of the sample. The second section presents analyses that tested hypotheses 1-4. These hypotheses were designed to examine differences between decided and undecided students. The third section presents analyses that tested hypotheses 5-10. These hypotheses were designed to examine the contribution of being undecided in explaining college student persistence. The fourth section presents results from the exploratory analyses outlined at the conclusion of Chapter 4.

Description of Data Sample

The means, standard deviations, and distributions of the variables are provided for persistence, precollege student characteristics, academic major choice and career choice, institutional environment characteristics, and student involvement measures.

Persistence (dependent variable)

Information about the dependent persistence measure is provided in Table 5.1. Recall that persistence in this study is defined as completion of the bachelor's degree

or completion of four years of study. For this sample, 60.7 percent of the students persisted. These data are highly reliable because they were not self-reported, but were provided by the registrars of the institutions involved in the study.

Table 5.1
Persistence:
Mean, Standard Deviation, and Distributions for Overall Sample

Variable	*N*	*Mean*	*SD*	%
Persistence	20,748	1.61	0.49	
(1)No				39.3
(2)Yes				60.7

Precollege Student Characteristics (independent variables)

Table 5.2 presents means, standard deviations, and distributions for the variables in the precollege student characteristics block. This sample has more women (58.9%) than men (41.1%), is predominantly white (88.4%), and has a majority of students who are 20 years of age (80.1%). The majority of these students have fathers who have achieved a college degree or higher: college degree (23.8%), attended some graduate school (4.9%), and graduate degree (29.2%). The mothers of these students appear to be well-educated also: some college (16.7%),

Table 5.2
Precollege Student Characteristics: Means, Standard Deviations, and Distributions for Overall Sample

Variable	*N*	*Mean*	*SD*	%
Student Gender	26,665	1.59	0.49	
(1)Male				41.1
(2)Female				58.9
Racial Background	26,665			
White				88.4
Black/Afro-American				4.3
Chicano/Mexican-American				1.7
Asian-American				4.2
American Indian				0.9
Puerto Rican				0.3
Age (as of 12/31/89)	26,612	3.14	0.50	
(1)18 or less				0.1
(2)19				3.5
(3)20				88.1
(4)21				15.5
(5)22				0.4
(6)23-26				0.3
(7)27 and older				0.1
Socioeconomic Status	23,743	18.85	5.68	
Father's Educational Level	26,133	5.56	2.08	
(1)Grammar school or less				2.5
(2)Some high school				4.7
(3)High school graduate				18.1
(4)Postsecondary other than college				4.2
(5)Some college				12.8
(6)College degree				23.8
(7)Some graduate school				4.6
(8)Graduate degree				29.2
Mother's Educational Level	26,243	4.97	1.84	
(1)Grammar school or less				1.9
(2)Some high school				3.2
(3)High school graduate				26.7
(4)Postsecondary other than college				7.9
(5)Some college				16.7
(6)College degree				25.3
(7)Some graduate school				4.9
(8)Graduate degree				13.4

Table 5.2 - continued

Variable	*N*	*Mean*	*SD*	%
High School Grades	26,459	6.15	1.48	
(1) D				0.1
(2) C				1.6
(3) C+				3.7
(4) B-				7.3
(5) B				19.5
(6) B+				23.7
(7) A-				21.9
(8) A/A+				22.2
High School Rank	26,192	4.51	0.79	
(1)Lowest 20%				0.3
(2)Fourth 20%				1.7
(3)Middle 20%				11.8
(4)Second 20%				18.7
(5)Highest 20%				67.5
SAT Composite Score	18,509	1049.92	196.27	
200-499				0.2
500-799				9.5
800-1099				43.7
1100-1399				42.2
1400-1600				4.3
Degree Aspirations	22,802	2.05	0.78	
(1)Bachelor's				28.3
(2)Master's				38.7
(3)Ph.D./M.D./Law				33.0
Self-Prediction: Obtain Bachelor's Degree	24,960	3.84	0.44	
(1)No chance				0.5
(2)Very little chance				1.6
(3)Some chance				11.5
(4)Very good chance				86.5
Self-Prediction: Drop out Temporarily	24,952	1.55	0.68	
(1)No chance				52.9
(2)Very little chance				40.4
(3)Some chance				5.9
(4)Very good chance				0.8
Self-Prediction: Drop out Permanently	24,881	1.28	0.52	
(1)No chance				74.8
(2)Very little chance				22.5
(3)Some chance				2.3
(4)Very good chance				0.4
Commitment to College Completion Factor	24,683	7.48	0.92	

college degree (25.3%), some graduate school (4.9%), and graduate degree (13.4%). The highest percentage of students have parents whose annual income is in the range of $40,000 - 49,999 (13.1%). However, the majority of parents have annual incomes of at least $30,000 (72.2%). The average score for socioeconomic status was 18.85 (scores ranged from 3 to 30). The highest percentage of students achieved average high school grades of B+ (23.7%) with 87.3% reporting average high school grades of B or better. The majority of students were ranked in the highest 20% of their high school class (67.5%). The mean SAT combined score was 1,050 with almost equal numbers scoring 800-1,099 (43.7%) and 1,100-1,399 (42.2%). Almost 72% of the students aspired to a degree beyond the bachelor's degree. Most students (86.5%) estimated there was a "very good chance" they would complete the bachelors's degree, 52.9% reported there was "no chance" they would drop out temporarily, and 74.8% estimated there was "no chance" they would drop out permanently.

Academic Major Choice and Career Choice (independent variables)

Table 5.3 presents means, standard deviations, and distributions for measures of students' academic major choice and career choice. For this sample, 7.5% of the students reported they were undecided about their academic major choice at the time of college entry, while 13.7% were undecided about their career choice. This resulted in about 21% of the sample being undecided about either academic major or

career choice. This total percentage of undecided students is at the low end of most estimates, but certainly within the 18-61% range that has emerged from other studies (Anderson, 1932; Astin, 1977; Baird, 1967; Berger, 1967; Crites, 1969; Lunnenborg, 1975; Tucci, 1963; Webb, 1949). Only 5.6% of the sample were undecided about both.

Table 5.3
Academic Major Choice and Career Choice: Means, Standard Deviations, and Distributions for Overall Sample

Variable	*N*	*Mean*	*SD*	*%*
Academic Major Choice	26,665	1.08	0.26	
(1)Decided				92.5
(2)Undecided				7.5
Career Choice	26,665	1.14	0.34	
(1)Decided				86.3
(2)Undecided				13.7
Combinations of Academic Major and Career Choice	26,665			
Undecided Major/ Undecided Career				5.6
Decided Major/ Decided Career				84.4
Undecided Major/ Decided Career				1.9
Decided Major/ Undecided Career				8.1

Institutional Environment Characteristics (independent variables)

Table 5.4 presents means, standard deviations, and distributions for the institutional environment characteristics. The average institutional selectivity is 1,067 as measured by average SAT combined score for the entering freshman class. The majority of institutions have average freshman SAT scores in the range of 800-1,099 (58.5%), but a considerable number have scores in the range of 1,100-1,399 (39.6%). The majority of institutions were privately controlled (57.3%). As outlined in the methodology chapter a measure of an institution's view toward undecided students was developed. This sample of institutions has an average undecidedness norm of 0.16 meaning an average of 16% of students are undecided about academic major choice or career choice across all institutions. There is an institutional high of 29.5% undecided and an institutional low of 6.1% undecided. While not variables that were used in the analyses, a number of additional characteristics are also useful in describing the sample. The vast majority of institutions have coeducational student populations and are historically white/integrated colleges. The size of the institutions in this study are quite varied with about 57% having enrollments of less than 7,500 and 43% having enrollments of more than 7,500. It is worth noting that about 21% of the institutions have enrollments of more than 15,000.

Table 5.4
Institutional Environment Characteristics: Means, Standard Deviations, and Distributions for Overall Sample

Variable	*N*	*Mean*	*SD*	*%*
Institutional Selectivity	26,621	1067.06	129.50	
200-499				0.0
500-799				1.6
800-1099				58.5
1100-1399				39.6
1400-1600				0.3
Institutional Control	26,622	1.57	0.50	
(1)Public				42.7
(2)Private				57.3
Undecidedness Norm	26,145	0.16	0.60	

Student Involvement Measures (independent variables)

The Follow Up Survey provides an opportunity for students to describe their college activities, experiences, and achievements. This information is summarized in Table 5.5. Students who enrolled full-time all four years accounted for 77% of the sample and students who lived on campus or in other institution-affiliated housing all four years represented 31% of the sample. Students in the sample most frequently received grades in the "B" range (36%) with the average falling between a "B" and "B+/A-." Almost half the sample reported enrollment in an honors program.

A number of survey items measured students' interaction and contact with other students. Most students either occasionally (41.3%) or frequently (58.7%) discussed course content with other students and a large number either occasionally (50%) or frequently (30.2%) worked on a group project for a class. Only a small percentage (4.4%) frequently tutored another student. About half the students (44.4%) participated occasionally or frequently in intramural sports. While 34.6% of the sample reported spending 0 hours per week in student clubs/organizations, the average (2.72) was between less than 1 hour and 1-2 hours per week. About one fourth (27.6%) belonged to a fraternity/sorority, 22% were elected to student office, and 24% reported being in a campus protest/demonstration.

A number of survey items measured student-faculty contact and interaction in both formal and informal settings. The largest percentages of students reported talking with faculty outside of class under 1 hour per week (38.8%) or 1-2 hours per

Table 5.5
Student Involvement Measures:
Means, Standard Deviations, and Distributions for Overall Sample

Variable	*N*	*Mean*	*SD*	*%*
Enrollment: Full-time	26,665	1.77	0.42	
(1)No				23.4
(2)Yes				76.6
Living Arrangements: On Campus	26,665	1.31	0.46	
(1)No				69.2
(2)Yes				30.8
Discussed Course Content with Students	26,052	2.56	0.55	
(1) Not at all				2.9
(2) Occasionally				41.3
(3) Frequently				58.7
Worked on Group Project for Class	26,052	2.10	0.70	
(1) Not at all				19.8
(2) Occasionally				50.0
(3) Frequently				30.2
Tutored Another Student	26,058	1.63	0.65	
(1) Not at all				46.2
(2) Occasionally				44.5
(3) Frequently				9.4
Participated in Intramural Sports	26,061	1.60	0.74	
(1) Not at all				55.7
(2) Occasionally				28.9
(3) Frequently				15.5
Member of Fraternity/ Sorority	26,207	1.27	0.44	
No				73.3
Yes				26.7
Student Clubs/ Organizations (hours per week)	25,891	2.72	1.65	
(1) None				34.6
(2) Under 1				12.0
(3) 1-2				22.5
(4) 3-5				18.1
(5) 6-10				7.5
(6) 11-15				2.6
(7) 16-20				1.1
(8) over 20				1.6

Table 5.5 - continued

Variable	*N*	*Mean*	*SD*	%
In Campus Protest/ Demonstration	26,131	1.24	0.43	
(1)No				76.2
(2)Yes				23.8
Student-Student Academic Involvement Factor	25,216	5.17	0.98	
Student-Student Social Involvement Factor	25,216	3.76	1.30	
Student Leadership/Political Involvement Factor	25,216	3.48	1.15	
Enrolled in Honors Program	26,061	1.46	0.50	
(1)No				53.6
(2)Yes				46.4
Elected to Student Office	26,160	1.22	0.42	
(1)No				77.8
(2)Yes				22.2
Assisted Professor's Research	26,151	1.22	0.41	
(1)No				78.2
(2)Yes				21.8
Assisted Faculty Teaching	26,144	1.16	0.37	
(1)No				84.2
(2)Yes				15.8
Talk with Faculty Outside of Class	25,987	2.68	0.97	
(1) None (hours per week)				7.5
(2) Under 1				38.8
(3) 1-2				37.0
(4) 3-5				13.3
(5) 6-10				2.5
(6) 11-15				0.6
(7) 16-20				0.2
(8) over 20				0.1
Been Guest in Professor's Home	26,061	1.35	0.53	
(1) Not at all				67.3
(2) Occasionally				30.0
(3) Frequently				2.7

Table 5.5 - continued

Variable	*N*	*Mean*	*SD*	%
Student-Faculty Interaction Factor	25,431	4.12	1.00	
College Grades	26,475	4.23	1.02	
(1) C- or less				0.7
(2) C				4.3
(3) C+ or B-				17.4
(4) B				36.0
(5) B+ or A-				32.7
(6) A or A+				8.9
Held Part-time Job: On Campus	26,239	1.59	0.49	
(1)No				40.7
(2)Yes				59.3
Held Part-time Job: Off Campus		1.58	0.49	
(1)No				41.6
(1)Yes				58.4
Held Full-time Job		1.09	0.28	
(1)No				91.2
(1)Yes				8.8

week (37%) and only 7.5% indicated not talking at all with faculty outside of class. A small percentage of students reported assisting faculty with teaching (16%) and assisting faculty with research (22%). The majority of students reported never having been a guest in a professor's home (67.3%).

Three survey items measured students' employment activity. A small percentage of students reported holding a full-time job (9%), but most held a part-time job on campus (59%) or off campus (58%).

Respondents vs. Non-respondents

While the data in this sample represent over 25,000 students attending over 300 colleges and universities, it is not entirely nationally representative. The 1989 follow-up of 1985 freshmen shares a problem common to many mail-out surveys: low response rates. Response rates varied significantly according to gender, race, and type of school. Women responded more than men; Whites, Chicanos, and Asian-Americans responded more than Blacks and other races; and students attending private schools responded more than those enrolled at public schools. Individuals who do not respond are often "different" from those who do respond. These differences can manifest in a variety of ways depending on what the survey measures. For this study, these differences manifest themselves in academic achievement measures and persistence. Respondents were almost twice as likely to have a high school GPA of A- or better, and less than one-half as likely to have a GPA of C+

or less. Respondents had higher overall SAT scores than non-respondents. Respondents were far more likely to have completed four years at their 1985 college and/or be currently enrolled. Non-respondents were three times as likely to have withdrawn before completing their first year.

Sophisticated weighting techniques have been employed at times in an attempt to correct for non-response bias (see Astin, Green, Korn, and Schalit, 1985). These weighting techniques are designed to estimate how those students who did not respond would have answered the follow-up survey items. However, adjustments to the data utilizing weighting strategies can produce distortion of the data. Individual differences between students can be magnified by the weighting factors and can obscure trends which actually exist in the population. Due to these potential problems, weighting techniques were not employed. Data analyses were carried out recognizing the sample limitations created by non-response bias.

Comparisons of Undecided and Decided Students

Part of the widely held belief that undecided students are attrition prone stems from the opinion that undecided students are somehow different from decided students when they enter higher education. As presented in the review of literature, a number of studies have compared undecided students to decided students utilizing a variety of personal variables and characteristics. The research findings from these studies

have often been contradictory and confusing. Because of this, additional study certainly makes sense. Although not the primary purpose of this study, the data provided a unique opportunity to compare undecided students to decided students on a variety of measures at the time of college entry. In addition, the only variables that have been examined once undecided students enter the institution have to do with academic performance and achievement (e.g., GPA, credits earned, persistence). The data for this study provided an opportunity to examine differences between undecided and decided students while they were in the college environment (i.e., student involvement and achievement). Again, being undecided has two primary dimensions, academic major choice and career choice. Most studies in this area have examined either academic major choice or career choice as separate indices of being undecided. While certainly some of these students are in both groups, earlier descriptions of the sample revealed that only 5% (see Table 5.3) were undecided about both academic major choice and career choice. Therefore, analyses were performed that compared undecided students with decided students by academic major choice and career choice.

Academic Major Choice

Hypothesis 1: Students initially undecided about *academic major* choice do not differ significantly from decided students on precollege characteristics measures.

Table 5.6 presents the results of the analyses comparing undecided to decided students and includes the means, standard deviations, distributions, *chi-square* values, and *t* values. Both the *chi-square test* (for nominal level data) and the *t-test* (for interval and ratio data) were used to determine significant differences between the groups and associations among the variables.

A total of 10 precollege characteristics were examined. Of the 10 variables, 8 showed statistically significant differences or associations: gender ($p < .001$); racial background ($p < .001$); socioeconomic status ($p < .001$); father's educational level ($p < .001$); mother's educational level ($p < .001$); SAT composite score ($p < .001$); degree aspirations ($p < .001$); and commitment to college completion ($p < .001$). The variables where no significant differences were found included high school grades and high school rank.

The significant *chi-square* for the gender by academic major choice analyses indicates that men and women were distributed significantly different across the two categories (undecided and decided). For females, 8.8% were undecided about academic major choice, while just 5.6% of males were undecided. It appears that a greater proportion of women were undecided about academic major choice when compared to men. This finding is consistent with one study (Twining & Twining, 1987). However, this finding is contrary to another study (Foote, 1980) which found that men were more likely to be undecided than women. In addition, other studies

Table 5.6
Comparisons Between Students Undecided and Decided About Academic Major Choice: Precollege Student Characteristics

	Academic Major Choice							
	Undecided[a]			*Decided*[b]				
Variable	*Mean*	*SD*	%	*Mean*	*SD*	%	χ^2	*t*
Student Gender								
Male			5.6			94.4	92.87**	
Female			8.8			91.2		
Racial Background								
White			7.7			92.3	26.30**	
Black/Afro-American			4.0			96.0		
Chicano/Mexican-American			5.1			94.9		
Asian-American			7.9			92.1		
American Indian			5.7			94.3		
Puerto Rican			4.8			95.2		
Socioeconomic Status	20.03	5.65		18.76	5.67			-8.97**
Father's Educational Level	6.00	2.02		5.52	2.08			-9.83**
Mother's Educational Level	5.32	1.83		4.94	1.84			-8.73**
High School Grades	6.13	1.46		6.15	1.48			0.52
High School Rank	4.51	0.80		4.52	0.79			0.37

Table 5.6 - continued

	Academic Major Choice							
	Undecided[a]			Decided[b]				
Variable	*Mean*	*SD*	%	*Mean*	*SD*	%	χ^2	*t*
SAT Composite Score	1077.19	201.44		1047.68	195.63			-5.42**
Degree Aspirations	1.96	0.77		2.05	0.78			4.66**
Commitment to College Completion Factor	7.25	0.99		7.50	0.91			11.44**

**$p < .001$.

[a] *N* varies from 1,406 to 1,996 due to unavailability of data or missing data from nonresponse.
[b] *N* varies from 17,103 to 24,669 due to unavailability of data or missing data from nonresponse.

found no association between gender and being undecided about academic major choice (Anderson, Creamer, & Cross, 1989; Ruskus & Solmon, 1984).

In terms of racial background, the percentage of Whites (7.7%) and Asian-Americans (7.9%) who were undecided about academic major choice was almost twice the percent of Blacks (4.0%) who were undecided. In addition, the percentage of undecided Whites and Asian-Americans was greater than all the other minority groups: Chicanos/Mexican Americans (5.1%), American Indian (5.7%), and Puerto Rican (4.8%). The significant *chi-square* indicates an association between racial background and academic major choice. This finding is not consistent with other studies that found no association between racial background and academic major choice (Anderson, Creamer, & Cross, 1989; Foote, 1980).

Students who were decided about academic major choice had significantly higher degree aspirations than those who were undecided. Students decided about academic major choice also had a higher mean score on the commitment to college completion factor than the undecided group.

Four of the precollege characteristics comparisons produced some interesting results. Students undecided about academic major choice had significantly higher mean scores than decided students on family socioeconomic status (20.03 vs 18.76), father's educational level (6.00 vs. 5.52), mother's educational level (5.32 vs. 4.94), and SAT scores (1,077 vs. 1,048). These findings are contrary to the results of other studies which found no differences between students undecided about academic major

choice and those who were decided (Anderson, Creamer, & Cross, 1989; Ashby, Wall, & Osipow, 1966; Foote, 1980; Ruskus & Solmon, 1984). In addition, the finding that the undecided group had higher average SAT scores is contrary to the results of one study (Chase & Keene, 1981) which found that decided students had higher average SAT scores.

The undecided group did not differ from the decided group on the measures of high school rank and high school grades. These findings are consistent with some studies (Anderson, Creamer, and Cross, 1989; Foote, 1981; Ruskus & Solmon, 1984). However, these findings are contrary to other studies (Ashby, Wall, & Osipow, 1966; Chase & Keene, 1981) which found decided students had higher high school rank and high school grades.

In examining precollege student characteristics along the dimension of academic major choice, analyses for 8 of 10 variables produced significant differences. Students undecided about academic major choice were found to be different from decided students on these measures, and therefore, hypothesis 1 was not supported.

Hypothesis 2: Students initially undecided about *academic major* choice do not differ significantly from decided students on student involvement measures.

The vast majority of studies that have compared undecided and decided students have focused on examining characteristics of these students prior to entering the institution (e.g., demographics, high school achievement, etc.). Once these students have entered the institution the variables that have typically been examined have to do with measures of college achievement (e.g., cumulative college GPA, credits earned, persistence). Indeed, there are two central premises behind the opinion that undecided students are attrition prone: undecided students are somehow different from decided students as they enter the institution and they achieve at lower levels once they are in the institution. However, the earlier review of literature concluded that undecided students are more similar than different from decided students in both precollege characteristics and achievement measures.

Beyond measures of college achievement very little, if anything, is known about other aspects of undecided students during the college experience. Earlier discussion about college impact models stressed the importance of numerous variables having potential impact on student persistence. Not only do student background characteristics present potential influences, but the college environment, including student involvement, can play a role. As outlined in the methodology section, the Follow Up Survey provided measures of college student activities and experiences. Thus, there was an opportunity to compare student involvement measures for students who entered the institution undecided about academic major choice versus those who entered decided. Because it is generally agreed that undecided students are not

different from decided students in terms of precollege characteristics and college achievement, it was hypothesized that no differences would be found for student involvement measures.

Table 5.7 presents the results of the analyses comparing undecided students to decided students for student involvement measures. A total of 11 student involvement measures were examined. Of the 11 variables, 4 showed statistically significant differences or associations: student-student academic involvement ($p < .001$); college grades ($p < .001$); held part-time job: on campus ($p < .001$); and held full-time job ($p < .001$). The variables where no significant differences were found included enrollment full-time, on-campus living arrangements, enrolled in honors program, student-student social involvement, student leadership/political involvement, student-faculty interaction, and held part-time job: off campus.

The significant t value for the student-student academic involvement comparison indicates that students decided about academic major choice had higher average scores (5.18) than the undecided students (5.09). It appears that the decided students on the average engaged in academic activities with other students more than the undecided students. The significant *chi-square* for full-time employment indicates that decided students (12.9%) were more likely than undecided students (8.8%) to hold a full-time job while in college. In addition, the significant *chi-square* for part-time job on campus indicates that undecided students (63%) were more likely than

Table 5.7
Comparisons Between Students Undecided and Decided About Academic Major Choice: Student Involvement Measures

	Academic Major Choice							
	Undecided[a]			*Decided*[b]				
Variable	*Mean*	*SD*	*%*	*Mean*	*SD*	*%*	χ^2	*t*
Enrollment: Full-time								
No			21.9			23.6	2.71	
Yes			78.1			76.4		
Living Arrangements: On Campus							1.43	
No			68.0			69.3		
Yes			32.0			30.7		
Honors Participation								
No			52.2			53.7	1.67	
Yes			47.8			46.3		
Student-Student Academic Involvement Factor	5.09	0.97		5.18	0.98			3.96**
Student-Student Social Involvement Factor	3.69	1.26		3.76	1.31			2.38
Student Leadership/Political Involvement Factor	3.50	1.14		3.47	1.15			-1.08
Student-Faculty Interaction Factor	4.15	0.99		4.13	1.00			-0.60

Table 5.7 - continued

	Academic Major Choice							
	Undecided[a]			Decided[b]				
Variable	*Mean*	*SD*	%	*Mean*	*SD*	%	χ^2	*t*
College Grades	4.31	0.99		4.22	1.02			-3.70**
Held Part-time Job: On Campus								
No			37.0			41.0	12.21**	
Yes			63.0			59.0		
Held Part-time Job: Off Campus								
No			41.6			38.1	9.62	
Yes			58.4			61.9		
Held Full-time Job								
No			91.2			87.1	27.78**	
Yes			8.8			12.9		

**$p < .001$.

[a] *N* varies from 1,406 to 1,996 due to unavailability of data or missing data from nonresponse.
[b] *N* varies from 17,103 to 24,669 due to unavailability of data or missing data from nonresponse.

decided students (59%) to engage in this type of employment. No studies were found with which to compare these findings.

The significant *t* value for college grades indicates that students undecided about academic major choice had significantly higher college grades than the decided group. The undecided group had a mean score of 4.31 while the decided group had a mean score of 4.22. This finding is not consistent with studies that found no significant differences (Abel, 1966; Ashby, Wall, & Osipow, 1966; City College of San Francisco, 1975; Foote, 1980) and studies that found decided students achieved significantly higher college grades (Anderson, Creamer, & Cross, 1989; Chase & Keene, 1981; Foote, 1980; Weitz, Clark, & Jones, 1955). Only one study was found that had a similar finding to this study (Watley, 1965).

In examining student involvement measures along the dimension of academic major choice, analyses for 4 of 11 variables produced significant differences. Students undecided about academic major choice were found to be very similar to decided students on these measures, and therefore, hypothesis 2 was generally supported.

Career Choice

Hypothesis 3: Students initially undecided about *career* choice do not differ significantly from decided students on precollege characteristics measures.

Table 5.8 presents the results of the analyses comparing undecided to decided students and includes the means, standard deviations, distributions, *chi-square* values, and *t* values. A total of 10 precollege characteristics were examined. Of the 10 variables, 8 showed statistically significant differences or associations between the two groups: gender ($p < .0001$); racial background ($p < .0001$); socioeconomic status ($p < .001$); father's educational level ($p < .0001$); mother's educational level ($p < .0001$); SAT composite score ($p < .001$); degree aspirations ($p < .001$); and commitment to college completion ($p < .001$). The variables where no significant differences were found included high school grades and high school rank.

The significant *chi-square* for the gender by career choice analysis indicates that men and women were distributed significantly different across the two categories (undecided and decided). Almost one third more females (15.5%) were undecided than males (11%). It appears women were more likely than men to be undecided about career choice. No studies were found that examined gender as it relates to being undecided about career choice. In fact, many of the studies that have examined

Table 5.8
Comparisons Between Students Undecided and Decided About Career Choice: Precollege Student Characteristics

	Career Choice							
	Undecided[a]			Decided[b]				
Variable	*Mean*	*SD*	%	*Mean*	*SD*	%	χ^2	*t*
Student Gender								
Male			11.0			89.0	107.55**	
Female			15.5			84.5		
Racial Background								
White			14.3			85.7	80.73**	
Black/Afro-American			5.6			94.4		
Chicano/Mexican-American			12.8			87.2		
Asian-American			12.4			87.6		
American Indian			8.8			91.2		
Puerto Rican			9.5			90.2		
Socioeconomic Status	20.07	5.56		18.67	5.67			-13.05**
Father's Educational Level	5.98	1.98		5.49	2.09			-12.96**
Mother's Educational Level	5.34	1.80		4.91	1.84			-12.92**
High School Grades	6.15	1.45		6.14	1.48			-0.23
High School Rank	4.51	0.80		4.52	0.79			0.39

Table 5.8 - continued

	Career Choice							
	Undecided[a]			Decided[b]				
Variable	*Mean*	*SD*	%	*Mean*	*SD*	%	χ^2	*t*
SAT Composite Score	1093.68	201.44		1066.67	192.85			-4.93**
Degree Aspirations	1.94	0.76		2.06	0.78			7.61**
Commitment to College Completion Factor	7.27	0.98		7.51	0.90			14.70**

**$p < .001$.
[a] *N* varies from 2,573 to 3,643 due to unavailability of data or missing data from nonresponse.
[b] *N* varies from 15,936 to 23,022 due to unavailability of data or missing data from nonresponse.

students undecided about career choice utilized males only (mostly White) as the sample (Abel, 1966; Elton & Rose, 1971; Marshall & Simpson, 1937; Miller, 1956; Rose & Elton, 1971).

In terms of racial background, the significant *chi-square* indicates an association between racial background and career choice. The percentages for Whites (14.3%), Asian-Americans (12.4%), and Chicanos/Mexican-Americans (12.8%) who were undecided about career choice were at least twice the percent of Blacks (5.6%) who were undecided. In addition, the percentages for undecided Whites, Asian-Americans, and Chicanos/Mexican-Americans were greater than the other minority groups: American Indian (8.8%) and Puerto Rican (9.5%). Unlike academic major choice, no studies were found that examined racial background and being undecided about career choice.

Students who were decided about career choice had significantly higher degree aspirations on the average than those who were undecided. This finding is contrary to the results of other studies which found no significant differences for degree aspirations (Ashby, Wall, & Osipow, 1966; Rose & Elton, 1971). Students decided about career choice also had a higher mean score on the commitment to college completion factor than the undecided group.

Four of the precollege characteristics comparisons produced some interesting results. Students undecided about career choice had significantly higher mean scores than decided students on family socioeconomic status (20.07 vs 18.67), father's

educational level (5.98 vs. 5.49), mother's educational level (5.34 vs. 4.91), and SAT scores (1,084 vs. 1,044). These findings are contrary to the results of other studies which found no differences between students undecided about career choice and those who were decided (Abel, 1966; Ashby, Wall, & Osipow, 1966; Baird, 1967; Elton & Rose, 1971; Rose & Elton, 1971; Williamson, 1937). In addition, the finding that the undecided group had higher average SAT scores is contrary to the results of two studies (Crawford, 1929; Taylor, 1982) which found that decided students had higher average SAT scores.

The undecided group did not differ from the decided group on the measures of high school rank and high school grades. These findings are consistent with some studies (Baird, 1967; Rose & Elton, 1971; Williamson, 1937). However, these findings are contrary to one other study (Ashby, Wall, & Osipow, 1966) which found decided students had higher high school grades.

In examining precollege characteristics along the dimension of career choice, analyses for 8 of 10 variables produced significant differences. Students undecided about career choice were found to be different from decided students on these measures, and therefore, hypothesis 3 was not supported.

Hypothesis 4: Students initially undecided about *career* choice do not differ significantly from decided students on student involvement measures.

Table 5.9 presents the results of the analyses comparing undecided students to decided students for student involvement measures. The table includes the means, standard deviations, distributions, *chi-square* values, and *t* values. A total of 11 student involvement measures were examined. Of the 11 variables, 4 showed statistically significant differences between the two groups: student-student academic involvement ($p < .001$); college grades ($p < .001$); held part-time job: on campus ($p < .001$); and held full-time job ($p < .001$). The variables where no significant differences were found included enrollment full-time, on-campus living arrangements, enrolled in honors program, student-student social involvement, student-faculty interaction, and held part-time job: off campus.

The significant *t* value for the student-student academic involvement comparison indicates that students decided about career choice had higher average scores (5.19) than the undecided students (5.08). It appears that the decided students on the average engaged in academic activities with other students more than the undecided students. The significant *chi-square* for full-time employment indicates that decided students (13.3%) were more likely than undecided students (8.3%) to hold a full-time job while in college. In addition, the significant *chi-square* for part-time campus job indicates that undecided students (62.4%) were more likely than decided students (58.8%) to engage in this type of employment. No studies were found with which to compare these findings.

Table 5.9
Comparisons Between Students Undecided and Decided About Career Choice: Student Involvement Measures

	Career Choice							
	Undecided[a]			Decided[b]				
Variable	*Mean*	*SD*	*%*	*Mean*	*SD*	*%*	χ^2	*t*
Enrollment: Full-time							2.26	
No			21.5			22.7		
Yes			78.5			77.3		
Living Arrangements: On Campus							4.50	
No			67.7			69.5		
Yes			32.3			30.5		
Honors Participation							6.88	
No			51.6			53.9		
Yes			48.4			46.1		
Student-Student Academic Involvement Factor	5.08	0.95		5.19	0.98			6.10**
Student-Student Social Involvement Factor	3.68	1.28		3.77	1.31			2.43
Student Leadership/Political Involvement Factor	3.49	1.15		3.47	1.15			-0.75
Student-Faculty Interaction	4.11	0.96		4.14	1.01			1.37

Table 5.9 - continued

	Career Choice							
	Undecided[a]			Decided[b]				
Variable	*Mean*	*SD*	%	*Mean*	*SD*	%	χ^2	*t*
College Grades	4.33	0.99		4.21	1.03			-6.73**
Held Part-time Job: On Campus								
No			37.6			41.2	16.54**	
Yes			62.4			58.8		
Held Part-time Job: Off Campus								
No			39.9			38.1	4.32	
Yes			60.1			61.9		
Held Full-time Job								
No			91.7			86.7	69.26**	
Yes			8.3			13.3		

**$p < .001$.
[a] *N* varies from 2,573 to 3,643 due to unavailability of data or missing data from nonresponse.
[b] *N* varies from 15,936 to 23,022 due to unavailability of data or missing data from nonresponse.

The significant *t* value for college grades indicates that students undecided about career choice had significantly higher college grades than the decided group. The undecided group had a mean score of 4.33 while the decided group had a mean score of 4.21. This finding is not consistent with studies that found no significant differences (Abel, 1966; Ashby, Wall, & Osipow, 1966; Williamson, 1937) and studies that found decided students achieved significantly higher college grades (Crawford, 1929; Marshall & Simpson, 1943).

In examining student involvement measures along the dimension of career choice, analyses for only 4 of 11 variables produced significant differences. Students undecided about career choice were similar to decided students on these measures, and therefore, hypothesis 4 was generally supported.

Summary of Comparisons Between Undecided and Decided Students

A rather remarkable pattern of results emerged from the analyses. Whether looking at academic major choice or career choice, the same differences and similarities were found between undecided and decided students across all variables examined. Therefore, this summary will discuss those similarities and differences without regard to academic major choice or career choice. Table 5.10 presents a summary of the findings from all the analyses.

In some ways the findings of this study only add to the already clouded and puzzling picture when comparing undecided to decided students. In examining

characteristics of students prior to entering an institution, 8 of 10 variables produced significant differences and so hypotheses 1 and 3 were not supported. Undecided students were more likely to be female. Whites, Asian-Americans, and Chicanos/Mexican-Americans were more likely to be undecided. Blacks/Afro-Americans, as a group, were the most likely to be decided about academic major and career choice. Decided students had higher degree aspirations and scored higher on the commitment to college completion factor. However, the differences for four of variables were in a direction never observed. Compared to decided students, undecided students were from families with higher socioeconomic status, had parents with higher educational levels, and achieved higher SAT composite scores. Finally, for measures of high school grades and high school rank, undecided and decided students were not different.

In examining student involvement measures, only 4 of the 11 variables produced significant differences and so hypotheses 2 and 4 were generally supported. Decided students had higher student-student academic involvement scores on the average than undecided students and they also were more likely to hold a full-time job. Undecided students had higher average college grades than the decided group and were more likely to have held a part-time job on campus. More importantly, there were no differences between the two groups on eight measures of student involvement: enrollment: full-time, living arrangements: on campus, honors participation, student-student social involvement, student leadership/political

Table 5.10
Summary of Comparisons Between Undecided and Decided Students

Differences	*No Differences*
Gender (more females undecided)	High school grades
Racial background (more Whites Asian-Americans, and Chicanos undecided)	High school rank
Socioeconomic status (undecided higher)	Full-time enrollment
Parental educational level (undecided higher)	On campus living arrangements
SAT composite score (undecided higher)	Honors participation
Degree aspirations (decided higher)	Student-student social involvement
Commitment to college completion (decided higher)	Student leadership/political involvement
Student-student academic involvement (decided higher)	Student-faculty interaction
Average college grades (undecided higher)	Part-time job: off campus
Part-time job: on campus (undecided more frequently)	
Full-time job (decided more frequently)	

involvement, student-faculty interaction, part-time job: on campus, and part-time job: off campus.

Although several differences were observed, particularly for precollege characteristics, some care must be exercised in interpreting these differences. Finding that a difference is statistically significant does not necessarily mean that the difference is large, nor does it mean the difference is important from a research perspective. With such a large sample as in this study ($N > 20{,}000$), small differences can be statistically significant. For example, students undecided about academic major had a degree aspirations mean score of 1.96 while the decided group had a mean score of 2.05. The standard deviations for each group were 0.77 and 0.78, respectively. A score of 2 on this item represented aspiring to a master's degree. For all practical purposes it appears that both groups on the average aspired to the master's degree level, yet the *t-test* produced a significant difference at $p < .001$. For a number of other variables small differences also produced significant results. In addition, in the search for differences a total of 42 separate tests were performed (21 for academic major choice and 21 for career choice). The danger in performing numerous tests is that you might expect a few to be significant just by chance alone. After all, results significant at the .001 level do occur 1 time in 1,000 in the long run even when H_0 is true.

The findings of this study were often contrary to other studies of undecided students. It is certainly possible that part of the explanation for this conflict lies in

differences in methodology and definitions of undecided. For example, the studies where no association was found for race and being undecided were single institution studies that did not examine numerous categories of racial background. One study examined only Blacks and Whites (Anderson, Creamer, & Cross, 1989) and another study collapsed all minority students into one group and compared them to Whites (Foote, 1980). The manner in which students were determined to be undecided varied considerably. Some studies labeled students as undecided based on the students' expressed choice on an admissions form/survey instrument where students selected from a list of potential majors or careers (Baird, 1967; Chase & Keene, 1981; Elton & Rose, 1971; Foote, 1980; Miller, 1956; Rose & Elton, 1971; Ruskus & Solmon, 1984; Titley & Titley, 1980). Some labeled students undecided based on measures from a career decision scale/instrument (Lucas & Epperson, 1988; Taylor, 1982). Some labeled students as undecided based on students' estimates of the certainty/satisfaction with their choice (Ashby, Wall, & Osipow, 1966; Holland & Holland, 1977; Watley, 1965; Williamson, 1937). Some defined undecided students through a personal interview or personal statement (Abel, 1966; Marshall & Simpson, 1943). Still other studies determined that students were undecided because they were not pursuing a degree program (Smitherman & Carr, 1981; Twining & Twining, 1987). Given this tremendous disparity in definitions it is not surprising that the results of these studies have often been contradictory, conflicting, and confusing.

In summary, a total of 21 variables were examined in comparing undecided students to decided students. Of these 21 variables, 12 produced significant (often small) differences, while 9 did not. In some cases the results supported previous research and in some cases the results were contrary to previous research. While some differences were found, it appears that the results of these analyses support what others have already concluded. Holland and Holland (1977) state:

> Attempts to comprehend the vocational decisiveness of some students and the indecisiveness of others are characterized by conflicting findings, negative findings, or negligible findings. Although vocationally undecided students have been assessed in many ways and with a vast range of variables, few clear or compelling differences emerge. Instead the most striking outcomes of these studies are that decided and undecided high school and college students are much more alike than different and that the relatively few differences are conflicting and confusing. (p. 404)

Also, Gordon (1981) states:

> The list of variables studied in relation to educationally and vocationally uncommitted students since the 1930s is all encompassing. Although many of these studies have attempted to determine what makes undecided students different from those who are able to make decisions, the majority found no significant differences. (p. 433)

In terms of looking at these variables as contributing to persistence an interesting picture emerges. Undecided students have the edge for socioeconomic status, mother's educational level, father's educational level, SAT scores, average college grades, and full-time employment. Decided students have the edge for degree aspirations, commitment to college completion, and student-student academic involvement. Gender and racial background were left out because of their unstable

nature in the persistence literature (see Chapter 3). Undecided students have the persistence advantage for 6 variables related to persistence and decided students have the advantage for 3 variables. From this somewhat simplistic exercise it would appear that undecided students have the persistence advantage, but this simplistic view is a problem. Which of these variables are the stronger predictors? Perhaps the three for the decided students are just as potent as the six for the undecided students. As outlined earlier, persistence is a complex, multi-dimensional phenomenon. It is better explained by simultaneously examining the variables that potentially contribute to persistence. The next section attempts to examine the impact of being undecided on persistence within a model that takes into consideration several variables associated with persistence.

The Impact of Being Undecided on Persistence

Previous studies that have examined undecided student persistence have generally concluded that these students are more likely than decided students to drop out. Analyses similar to what have been performed in previous studies were carried out. Persistence rates of undecided and decided students were compared in a simple crosstabulation and then a *chi-square* statistic was obtained. Table 5.11 presents the results of the analysis for academic major choice. Students undecided about academic major choice persisted at a rate of 65.4% compared to 60.3% for the decided students. The *chi-square* was significant at $p < .0001$. Table 5.12 presents the results of the analysis for career choice. Students undecided about career choice persisted at a rate of 66.4% compared to 59.7% for the decided students. The *chi-square* was significant at $p < .0001$.

For both analyses, undecided students were more likely to persist than decided students. Of course, this is contradictory to previous findings which have used this type of research design and have concluded that undecided students are attrition prone. It would be very easy to infer at this point that being undecided increases a student's chances of persisting, but it would be misleading. As pointed out earlier, the explanation of college student persistence behavior is complex. Research designs which attempt to attribute persistence behavior to a single variable are inadequate in trying to account for this complexity.

Table 5.11
Comparison Between Students Undecided and Decided About Academic Major Choice: College Student Persistence

	Academic Major Choice		
	Undecided[a]	*Decided*[b]	
Variable	%	%	χ^2
Persistence			16.39*
No	34.6	39.7	
Yes	65.4	60.3	

*$p < .0001$

Table 5.12
Comparison Between Students Undecided and Decided About Career Choice: College Student Persistence

	Career Choice		
	Undecided[a]	*Decided*[b]	
Variable	%	%	χ^2
Persistence			46.39*
No	33.6	40.3	
Yes	66.4	59.7	

*$p < .0001$

The analysis which follows examines the contribution of being undecided in explaining college student persistence. The research design was developed to capture the complexities inherent in college student persistence. The prediction of student persistence was performed utilizing Astin's I-E-O model of college impact and stepwise multiple regression. Astin's model takes into consideration the numerous factors and forces which can contribute to persistence. Multiple regression analysis provides the technique for examining several variables simultaneously for their contribution in predicting persistence.

Table 5.13 presents the means and standard deviations for all variables that were entered into the regression. Appendix C, Table C.1 provides the correlation matrix for all variables. Listwise deletion of missing data resulted in 12,227 cases being utilized for the regression analysis. Cases were eliminated in which viable data were not available for every variable. While listwise deletion resulted in the elimination of a considerable number of cases, this method was chosen over another alternative. In studies where large numbers of cases are lost due to missing data, a common practice is to substitute the variable means for the cases with missing data. This technique was not utilized because it creates an artificial situation in which values for individual cases are created when the true value is unknown. In addition, substituting the mean for missing variables reduces their variance and thus, creates artificial variance estimates.

Table 5.13
Means and Standard Deviations for All Variables in the Regression Analysis (N = 12,227)

Variable	*Mean*	*SD*
Precollege Student Characteristics		
Gender: Female	1.566	0.496
Race: White	1.896	0.305
Race: Black/Afro-American	1.042	0.200
Race: American Indian	1.007	0.082
Race: Asian-American	1.045	0.206
Race: Chicano\Mexican-American	1.012	0.108
Race: Puerto-Rican American	1.002	0.050
Father's Educational Level	5.774	2.037
Mother's Educational Level	5.129	1.849
Socioeconomic Status	19.555	5.604
High School Rank	4.634	0.706
High School Grades	6.446	1.396
SAT Composite Score	1098.203	191.112
Degree Aspirations	2.133	0.777
Commitment to College Completion	7.521	0.883
Academic Major Choice/Career Choice		
Academic Major: Undecided	1.076	0.265
Career Choice: Undecided	1.135	0.342
Decided Major/Decided Career	1.847	0.360
Undecided Major/Undecided Career	1.058	0.233
Decided Major/Undecided Career	1.077	0.267
Undecided Major/Decided Career	1.018	0.134

Table 5.13 - continued

Variable	*Mean*	*SD*
Institutional Environment Characteristics		
Control: Private	1.720	0.449
Institutional Selectivity	1100.925	135.882
Undecidedness Norm	0.165	0.061
Student Involvement Measures		
Enrollment: Full-time	1.891	0.312
Living Arrangements: On Campus	1.399	0.490
Enrolled in Honors Program	1.525	0.499
Held Part-time Job: On Campus	1.632	0.482
Held Part-time Job: Off Campus	1.571	0.495
Held Full-time Job	1.099	0.299
Student-Student Academic Involvement	5.236	0.934
Student-Student Social Involvement	3.881	1.288
Student Leadership/Political Involvement	3.613	1.158
Student-Faculty Interaction	4.207	0.993
College Grades	4.345	0.981
Persistence	1.690	0.462

Table 5.14 presents the full regression analysis for estimating persistence. The table includes the simple correlation (r) for each independent variable with the dependent variable, the multiple correlation (R) at each step of the regression, the multiple correlation squared (R^2) at each step of the equation, and the standardized regression coefficients (*Betas)* at each step of the regression. Variables that did not enter the regression equation are also included in the table. The variables that entered the regression are discussed according to the blocks in which they were ordered in the regression analysis: precollege student characteristics, academic major choice and career choice, institutional environment characteristics, and student involvement measures.

With a few exceptions, it can be seen that the *Betas* consistently decreased at each step of the regression. This pattern can be explained in terms of multicollinearity. Simply stated, multicollinearity refers to the simple correlations among the independent variables. With nonexperimental social science data, the independent variables are virtually always intercorrelated, that is, multicollinear.(Lewis-Beck, 1989). High multicollinearity may lead not only to serious distortions in the estimates of the magnitudes of the regression coefficients, but also to reversals in their signs (Lewis-Beck, 1989; Pedhazur, 1982). Unfortunately, there is no commonly accepted solution to the problem of multicollinearity (Pedhazur, 1982).

Table 5.14
Predicting Student Persistence:
The Impact of Being Undecided While Controlling for Other Variables Related to Persiste

Step	Variable Name	R	R^2	r	1	2	3	4	5	6	7
	Precollege Student Characteristics										
1	Average High School Grades	18	03#	18**	18**	17**	13**	13**	13**	12**	12
2	Socioeconomic Status	21	04#	12**	11**	11**	09**	09**	09**	06**	03
3	SAT: Composite Score	22	05#	17**	11**	07**	07**	09**	08**	05**	-03
4	Gender: Female	22	05#	03*	02	02	04*	04*	04*	03	03
5	Race: White	23	05#	05**	05**	04**	04*	04*	04*	05**	06
	Institutional Environment Characteristics										
6	Control: Private	30	09#	24**	23**	21**	21**	21**	21**	21**	19
7	Institutional Selectivity	33	11#	24**	20**	18**	19**	19**	20**	16**	16
	Student Involvement Measures										
8	Enrollment: Full-time	43	19#	31**	30**	29**	29**	29**	29**	29**	29
9	Living Arrangements: On Campus	45	20#	27**	24**	24**	23**	23**	23**	20**	19
10	Student-Student Social Involvement	46	21#	17**	16**	15**	15**	16**	15**	15**	15
11	Held Full-time Job	47	22#	-20**	-18**	-17**	-17**	-17**	-17**	-17**	-16
12	Average College Grades	47	23#	19**	13**	12**	11**	11**	11**	09**	11
13	Student-Faculty Interaction	48	23#	16**	15**	14**	14**	14**	14**	12**	11
14	Part-time Job: Off Campus	48	23#	-14**	-13**	-12**	-11**	-12**	-11**	-10**	-08
15	Student-Student Leadership/ Political Involvement	48	23#	16**	14**	13**	13**	13**	13**	11**	11
16	Student-Student Academic Involvement	48	23#	15**	14**	14**	14**	15**	14**	14**	15

ence:
ded While Controlling for Other Variables Related to Persistence

	R	R^2	r	Beta After Step 1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grades	18	03#	18**	18**	17**	13**	13**	13**	12**	12**	08**	07**	07**	06**	04	04	03
	21	04#	12**	11**	11**	09**	09**	09**	06**	03	02	03	02	01	01	00	00
	22	05#	17**	11**	07**	07**	09**	08**	05**	-03	-03	-04	-03	-03	-05*	-05*	-05*
	22	05#	03*	02	02	04*	04*	04*	03	03	04*	04**	05**	05**	04**	04**	04*
	23	05#	05**	05**	04**	04*	04*	04*	05**	06**	05**	06**	05**	05**	05**	05**	05*
ment																	
	30	09#	24**	23**	21**	21**	21**	21**	21**	19**	19*	16**	17**	17**	16**	15**	15*
vity	33	11#	24**	20**	18**	19**	19**	20**	16**	16**	16**	13**	13**	12**	14**	14**	13*
easures																	
	43	19#	31**	30**	29**	29**	29**	29**	29**	29**	29**	26**	25**	23**	23**	23**	23*
	45	20#	27**	24**	24**	23**	23**	23**	20**	19**	14**	14**	12**	12**	12**	11**	10*
l	46	21#	17**	16**	15**	15**	16**	15**	15**	15**	12**	10**	10**	10**	10**	09**	09*
	47	22#	-20**	-18**	-17**	-17**	-17**	-17**	-17**	-16**	-11**	-10**	-09**	-09**	-09**	-09**	-08*
s	47	23#	19**	13**	12**	11**	11**	11**	09**	11**	08**	08**	09**	08**	08**	07**	07*
action	48	23#	16**	15**	14**	14**	14**	14**	12**	11**	09**	08**	06**	06**	05**	05**	05*
mpus	48	23#	-14**	-13**	-12**	-11**	-12**	-11**	-10**	-08**	-05**	-05**	-04**	-04*	-04*	-04*	-04*
rship/ nt	48	23#	16**	14**	13**	13**	13**	13**	11**	11**	09**	07**	02	02	04	06*	06*
mic	48	23#	15**	14**	14**	14**	15**	14**	14**	15**	10**	09**	06**	06**	05**	04*	04*

s Related to Persistence

Beta After Step												
4	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
13**	13**	12**	12**	08**	07**	07**	06**	04	04	03	03	03
09**	09**	06**	03	02	03	02	01	01	00	00	00	00
09**	08**	05**	-03	-03	-04	-03	-03	-05*	-05*	-05*	-04	-04
04*	04*	03	03	04*	04**	05**	05**	04**	04**	04**	05**	05**
04*	04*	05**	06**	05**	06**	05**	05**	05**	05**	05**	05**	05**
21**	21**	21**	19**	19*	16**	17**	17**	16**	15**	15**	16**	16**
19**	20**	16**	16**	16**	13**	13**	12**	14**	14**	13**	14**	14**
29**	29**	29**	29**	29**	26**	25**	23**	23**	23**	23**	22**	22**
23**	23**	20**	19**	14**	14**	12**	12**	12**	11**	10**	10**	10**
16**	15**	15**	15**	12**	10**	10**	10**	10**	09**	09**	13**	11**
-17**	-17**	-17**	-16**	-11**	-10**	-09**	-09**	-09**	-09**	-08**	-08**	-08**
11**	11**	09**	11**	08**	08**	09**	08**	08**	07**	07**	08**	07**
14**	14**	12**	11**	09**	08**	06**	06**	05**	05**	05**	06**	05**
-12**	-11**	-10**	-08**	-05**	-05**	-04**	-04*	-04*	-04*	-04*	-04*	-04*
13**	13**	11**	11**	09**	07**	02	02	04	06*	06*	06*	06*
15**	14**	14**	15**	10**	09**	06**	06**	05**	04*	04*	04*	04*

Table 5.14 - continued

Step	Variable Name	R	R^2	r	1	2	3	4	5	6	
	Variables Not in Equation										
	Race: Black			-05**	-02	-02	-01	-01	02	01	
	Race: American Indian			00	00	00	00	00	00	00	
	Race: Asian-American			-01	-03	-03	-04*	-04*	-02	-01	-
	Race: Chicano/Mexican-American			-04*	-04*	-03	-02	-02	-02	-01	-
	Race: Puerto Rican-American			-02	-02	-02	-02	-02	-01	-01	-
	Father's Educational Level			12**	10**	02	02	01	02	01	
	Mother's Educational Level			11**	08**	-01	-01	-01	-01	-01	-
	High School Rank			12**	05*	05*	04	04	04	06**	
	Degree Aspirations			09**	05**	03	02	02	03	-00	-
	Undecidedness Norm			21**	18**	16**	16**	15**	15**	10**	
	Commitment to College Completion			03	02	02	02	02	02	03	
	Academic Major: Undecided			02	02	02	01	01	01	01	
	Career Choice: Undecided			05**	05**	04*	03	03	03	02	
	Decided Major/Decided Career			-05**	-05**	-04**	-04*	-03	-03	-03	-
	Undecided Major/Undecided Career			02	02	01	01	01	00	00	
	Decided Major/Undecided Career			05**	05**	04*	04*	03	03	03	
	Undecided Career/Decided Major			02	02	02	01	01	01	01	
	Enrolled in Honors Program			12**	08**	06**	05**	05**	06**	04*	
	Part-time Job: On Campus			10**	08**	09**	08**	08**	08**	06**	

N = 12,227
*p < .001, **p < .0001
#Change in R^2 significant at p < .001 when variable added to the regression equation.
Note: Decimals omitted from coefficients.

	R	R^2	r	Beta After Step 1	2	3	4	5	6	7	8	9	10	11	12	13	1
quation			-05**	-02	-02	-01	-01	02	01	03	03	01	01	01	02	02	0
an			00	00	00	00	00	00	00	00	01	00	01	01	01	01	0
n			-01	-03	-03	-04*	-04*	-02	-01	-02	-02	-01	-01	-01	-01	-01	-0
can-American			-04*	-04*	-03	-02	-02	-02	-01	-02	-02	-02	-02	-02	-02	-02	-0
-American			-02	-02	-02	-02	-02	-01	-01	-01	-01	-01	-01	-01	-01	-01	-0
al Level			12**	10**	02	02	01	02	01	01	01	01	01	01	01	01	0
al Level			11**	08**	-01	-01	-01	-01	-01	-01	-01	-02	-02	-02	-02	-02	-0
			12**	05*	05*	04	04	04	06**	05*	04	04	04	04	04	04	0
			09**	05**	03	02	02	03	-00	-02	-01	-01	-01	-01	-01	-02	-0
			21**	18**	16**	16**	15**	15**	10**	03	03	03	03	02	02	01	0
ege			03	02	02	02	02	02	03	03	02	01	01	01	02	02	0
decided			02	02	02	01	01	01	01	00	01	01	01	00	00	00	0
ecided			05**	05**	04*	03	03	03	02	02	02	02	02	02	02	02	0
ded			-05**	-05**	-04**	-04*	-03	-03	-03	-02	-02	-02	-02	-02	-02	-02	-0
decided			02	02	01	01	01	00	00	00	-00	-00	-00	-00	-00	-00	-0
cided			05**	05**	04*	04*	03	03	03	02	02	02	03	03	02	02	0
ecided			02	02	02	01	01	01	01	01	01	01	01	01	01	01	0
Program			12**	08**	06**	05**	05**	06**	04*	04**	03	03	02	03	01	00	0
Campus			10**	08**	09**	08**	08**	08**	06**	04**	03	01	01	01	01	-00	-0

at $p < .001$ when variable added to the regression equation.
rom coefficients.

Beta After Step												
4	5	6	7	8	9	10	11	12	13	14	15	16
-01	02	01	03	03	01	01	01	02	02	01	02	02
00	00	00	00	01	00	01	01	01	01	01	01	01
-04*	-02	-01	-02	-02	-01	-01	-01	-01	-01	-01	-02	-01
-02	-02	-01	-02	-02	-02	-02	-02	-02	-02	-02	-02	-02
-02	-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-01
01	02	01	01	01	01	01	01	01	01	01	01	01
-01	-01	-01	-01	-01	-02	-02	-02	-02	-02	-02	-02	-02
04	04	06**	05*	04	04	04	04	04	04	04	04	04
02	03	-00	-02	-01	-01	-01	-01	-01	-02	-02	-01	-01
15**	15**	10**	03	03	03	03	02	02	01	01	01	01
02	02	03	03	02	01	01	01	02	02	02	02	01
01	01	01	00	01	01	01	00	00	00	00	00	00
03	03	02	02	02	02	02	02	02	02	02	02	02
-03	-03	-03	-02	-02	-02	-02	-02	-02	-02	-02	-02	-02
01	00	00	00	-00	-00	-00	-00	-00	-00	-00	-00	-00
03	03	03	02	02	02	03	03	02	02	02	02	03
01	01	01	01	01	01	01	01	01	01	01	01	01
05**	06**	04*	04**	03	03	02	03	01	00	00	01	00
08**	08**	06**	04**	03	01	01	01	01	-00	-00	00	-00

egression equation.

Many of the independent variables in this study were significantly correlated with one another. For example, the correlation between high school grades and college grades was $r=.47$. The correlation between institutional selectivity and SAT composite score was $r=.60$. As these variables entered the regression, they had to share some of the variance associated with the dependent persistence variable, so their unique *Betas* tended to be reduced at each step.

Consistent with the earlier mention of nonexperimental social science data, multicollinearity did exist in this study. However, the issue is whether there was evidence of *high* multicollinearity. A frequent practice is to examine the bivariate correlations among the independent variables, looking for coefficients of about .80 or higher. Although not 100% foolproof, if none is found there is some assurance that *high* multicollinearity does not exist. An examination of the correlation matrix for this study revealed no coefficients of .80 or higher. Therefore, it was reasonable to assume that *high* multicollinearity did not exist.

Block 1 - Precollege Student Characteristics

In the precollege student characteristics block, five variables entered the regression and were all positively associated with persistence: average high school grades ($r=.18$), socioeconomic status ($r=.21$), SAT composite score ($r=.17$) gender: female ($r=.03$), and race: White ($r=.05$). By far the single best predictor from the precollege student characteristics block was high school grades followed by family

socioeconomic status. The following precollege student characteristics did not enter the regression equation: race: Black, race: Chicano/Mexican-American, rage: Asian-American, race: American Indian, race: Puerto Rican, father's educational level, mother's educational level, high school rank, degree aspirations, and commitment to college completion. After all the variables in this block entered, the multiple correlation was $R=.23$ and $R^2=.05$. Precollege student characteristics accounted for about 5% of the variance in explaining persistence. Although three of the five variables ended up with nonsignificant *Betas* in the final equation (step 16), these variables cannot be dismissed. Each produced a significant ($p < .001$) change in R^2 thereby contributing to explaining the variance in the dependent variable (persistence).

Block 2 - Academic Major Choice and Career Choice

Referring to Table 5.12, it is evident that the measures of being undecided about academic major choice and career choice did not enter the regression equation. In addition, none of the combinations of these two variables entered as significant predictors of persistence. The simple correlation with persistence and the final *Beta* for each measure were as follows: academic major choice: undecided ($r=.02$, $Beta=.00$); career choice: undecided ($r=.05$, $Beta=.02$); decided major/decided career ($r=.02$, $Beta=-.00$); decided major/undecided career ($r=.05$, $Beta=.03$); undecided career/decided major ($r=.02$, $Beta=.01$). Hypotheses 5-10 were

supported since none of the measures of being undecided contributed to the prediction of persistence. Even knowing the most undecided students (undecided about major and career) was of no value in estimating students' chances to persist. In addition, students who were the most decided (selected a major and career) did not experience increased chances of persisting.

Since the primary purpose of this study was to examine the impact of being undecided on persistence, the following questions deserve some attention. Why were these findings contrary to previous research that found undecided students to be attrition prone? Why were these findings contrary to the widely held opinion and belief that undecided students are attrition prone?

In the review of literature, methodological shortcomings were illuminated for most previous studies of undecided student persistence. This study's findings were different from these previous studies largely due to differences in methodology. The studies cited previously attributed the outcome (persistence or withdrawal) to a single student characteristic (being undecided). Nothing was done to control for potentially biasing variables known to be associated with persistence. The studies found that high percentages of withdrawing and nonreturning students were undecided so the conclusion was drawn that being undecided contributes to withdrawal behavior. In considering the vast, multidimensional complexities involved in trying to understand student educational attainment, it makes little sense to talk about a single student characteristic (undecided about major or career) as being singly responsible for

explaining whether or not a student persists. This study, through a theoretical framework of college impact and a multivariate research design, recognized this complexity and accounted for numerous variables that have been shown to contribute to persistence. After accounting for these variables, being undecided did not contribute to the explanation of persistence and, thus, the findings were contrary to previous research.

Being undecided did not contribute to explaining persistence most probably because the initial decision about academic major or career choice is very unstable. It is often assumed that students make academic major choices or career choices based on complete understanding of themselves, program requirements, and occupational fields. However, most studies have estimated that 50-60% of all students change their major at least once before graduation (Akenson & Beecher, 1967; Astin, 1977; Burns & Kischler, 1972; Gordon, 1976; Hoffman & Grande, 1979). Titley and Titley (1980) found that 74% of beginning students indicated some form of undecidedness, tentativeness, or uncertainty about selecting a major. In the present study, 53% of the students changed their academic major choice between 1985 and 1989 and 57% changed their career choice. In addition, at the time of college entry in 1985, 59% indicated "some chance" or a "very good chance" that they would change their academic major choice and 63% indicated the same for career choice. Apparently large numbers of students are in a state of transition. Initial choices of academic major and career choice can only be viewed as tentative

at best. Trying to predict persistence on the basis of initial major or career choice is like trying to hit a moving target.

Undecided students do not comprise a homogenous group. Analyses from this study found few meaningful differences between undecided and decided students. The findings of this study demonstrate that they are more a heterogenous group and making generalizations about them (e.g., they are attrition prone) can be misleading. Indeed, it appears that entering undecided students reflect more a microcosm of the freshman class. They have the ability or inability to persist based on personal characteristics, the institutional environment, and college involvement regardless of whether they are undecided.

We do not know enough about the roots of indecision nor the factors associated with being undecided. Holland and Holland (1977) state that "the evidential situation is compounded by divergent speculations about the origins of vocational indecision. In addition, there is some experimental support for each of these diverse ideas" (p. 404). "There are as many reasons for being undecided as there are students" (Gordon, 1984, p. 75). In addition, several studies have concluded that multiple causes of indecision do exist. With all this variability in explaining and understanding student indecision, it is not surprising that undecided students were not any more or less likely to persist than decided students.

Block 3 - Institutional Environment Characteristics

In the institutional environment characteristics block, two of three measures entered the regression equation and were positively associated with persistence: control: private (r=.24) and institutional selectivity (r=.24). The *Betas* for these variables remained strong throughout the regression and were highly significant in the final equation at step 16 (.16 and .14). Attending a private institution and attending a selective institution were both associated with increased chances of persisting. The measure of an institution's undecidedness norm did not enter the regression equation. The multiple correlation increased from R=.23 to R=.33 as a result of these institutional environment variables. The R^2 increased to .11 and so the institutional environment block accounted for 6% of the variance in explaining persistence. Each variable produced a significant ($p < .001$) change in R^2.

Block 4 - Student Involvement Measures

For the student involvement measures block, nine variables entered the regression equation as significant predictors of persistence. The following were positively associated with persistence: full-time enrollment (r=.31), on campus housing (r=.27), student-student social involvement (r=.17), average college grades (r=.19), student-faculty interaction (r=.16), student leadership/political involvement (r=.16), and student-student academic involvement (r=.15). Negatively correlated with persistence were: held full-time job (r=-.20) and part-time job: off campus

(r=-.14). The significant final *Beta* weights at step 16 allowed for the following interpretation. It appears that students who enrolled full-time all four years, lived on campus all four years, achieved good college grades, and became involved with faculty and students experienced greater chances of persisting. On the contrary, having a full-time job or a part-time job off campus were associated with decreased chances of persisting.

In this block of student involvement measures it is important to point out that the variable "enrollment: full-time" had the largest simple correlation with persistence (r=.31) of any of the variables in the equation, had by far the strongest *Beta* weight (.22) at the final step of all the variables in the equation, produced the greatest increase in R^2 (8%) of any of the variables, and had a substantial effect on several other variables. In many ways it appears that being enrolled full-time all four years was a major determinant in whether a student persisted.

In order to understand the effect that "enrollment: full-time" had on other variables in equation, it was important to examine what happened to the other variables as "enrollment: full-time" entered the equation at step 8 (see Table 5.14). The analyses revealed that nine variables experienced considerable fluctuations in predictive quality after "enrollment: full-time" entered the equation. The following variables experienced substantial changes in their *Beta* weights as a result: (a) average high school grades decreased from .12 to .08; (b) living arrangements: on campus decreased from .19 to .14; student-student social involvement decreased from

.15 to .12; held full-time job decreased from -.16 to -.11; average college grades decreased from .11 to .08; student-faculty interaction decreased from .11 to .09; part-time job: off campus decreased from -.08 to -.05; student political/leadership involvement decreased from .11 to .09; student-student academic involvement decreased from .15 to .10.

Certainly these decreases in the *Beta* weights can be explained in part by multicollinearity. All of the variables had significant correlations with full-time enrollment ranging from .10 to .23. As "enrollment: full-time" entered the equation, these variables had to share increasing amounts of predictive power with each other. Since the predictive power of the independent variables gets spread across larger numbers of variables, the predictive power of any one variable gets smaller. However, these significant correlations were quite logical. In some ways, the correlations and predictive strength of being enrolled full-time are artifacts of its definition. Students enrolled full-time would certainly be more likely to live on campus and thus, would probably experience more opportunities for student and faculty contact and academic involvement. In addition, students enrolled full-time would be less likely to hold a full-time job. In the language of path analysis, being enrolled full-time has an "indirect" effect on persistence. The other student involvement variables have "direct" effects on persistence mediated through full-time enrollment.

All the variables in this block remained significant predictors in the final equation (step 16). After all the variables in this block entered the regression equation, the multiple correlation was $R = .48$ and R^2 increased from .11 to .23. Student involvement measures accounted for 12% of the variance in predicting student persistence. Each variable produced a significant ($p < .001$) change in R^2 as it entered the equation.

Summary of the Multiple Regression Analysis

Consistent with the literature and college impact theory, several precollege student characteristics, institutional environment characteristics, and student involvement measures entered the regression equation as significant predictors of persistence. In the precollege student characteristics block the following variables entered the regression equation and accounted for 5% of the variance in explaining student persistence: average high school grades, socioeconomic status, SAT: composite score, gender: female, race: White. In the institutional environment block the following variables entered the regression equation and accounted for 6% of the variance in explaining student persistence: control: private and selectivity. In the student involvement measures block the following variables entered the regression equation as significant predictors of persistence and accounted for 12% of the variance in explaining student persistence. When all variables in the regression equation were entered only 23% of the variance in explaining student persistence was

accounted for. Clearly there is more unexplained about student persistence than explained. This result is consistent with other similar studies. While college impact theory gives us a glimpse into the mechanisms that contribute to student persistence, there is much that is still not understood. As Tinto (1986) has stated, "we have not yet adequately isolated the events that lead persons to leave. Until we do so, it should not be surprising that our models of departure [persistence] will continue to explain relatively small percentages of variance in leaving behaviors" (p. 378).

The most striking result of the multiple regression analysis was that none of the measures of being undecided entered the regression equation as significant predictors of persistence. In other words, none of the measures contributed anything to the explanation of student persistence. It is worth noting that knowing the most undecided or the most decided was of no value in predicting persistence. From the results of these analyses it appears that undecided students were not attrition prone and were not any less likely to persist than decided students.

Exploratory Analyses

As outlined in the methodology section (Chapter 4), additional multiple regression analyses were performed to examine predictors of student persistence at the single institution level. The purpose of these analyses was to examine how the independent variables contributed to explaining persistence at different institutions.

Particularly of interest was how the measures of being undecided contributed to explaining persistence at individual institutions.

Institutions with at least 200 cases were randomly selected from three groups based on institutional persistence rates. High persistence was considered to be greater than 70%, moderate persistence was considered to be between 40% and 70%, and low persistence was considered to be less than 40%. Two institutions were randomly selected from each of these persistence rates groupings.

While it is inappropriate to identify each institution by name, it is possible to identify the kind of institution. The CIRP classifies institutions into 37 different groupings. The major stratifying factors are institutional race (predominantly black versus predominantly white), type (two-year college, four-year college, university), control (public, private-nonsectarian, Roman Catholic, and Protestant), and institutional selectivity. Astin, Green, Korn, and Schalit (1985) provide a more complete description of this stratification scheme.

Table 5.15 presents a summary of the major statistics from the multiple regression analyses performed for the six institutions. The following statistics are provided: the simple correlation (r) of each independent variable with persistence, the *Beta* coefficient as the variable entered the regression equation (Beta In), the *Beta* coefficient for the variable in the final equation (Final Beta), the multiple correlation (R), and the multiple correlation squared (R^2). The institutions were identified with the letters A through F. Institution A was a highly selective, public university with

Table 5.15

Predicting Student Persistence at Individual Institutions:
The Impact of Being Undecided While Controlling for Other Variables Related to Persistence

	Institution A			*Institution B*			*Institution C*			*Institution D*			*Institution E*			*Institution F*		
Variable Name	*r*	*Beta In*	*Final Beta*	*r*	*Beta In*	*Final Beta*	*r*	*Beta In*	*Final Beta*	*r*	*Beta In*	*Final Beta*	*r*	*Beta In*	*Final Beta*	*r*	*Beta In*	*Final Beta*
Precollege Student Characteristics																		
Gender: Female							17**	15**	13**	20**	20**	20**						
Race: White/Caucasian	13**	10**	08**	23**	23**	17**												
Race: Black/Afro-American																		
Race: American Indian	-08*	-09*	-08*															
Race: Asian-American										-11*	-11*	-12*						
Socioeconomic Status	17**	17**	14**															
Average High School Grades	11**	10*	05	17**	15*	08	17**	17**	05							15*	15*	14*
Commitment to College Completion	13**	14**	16**							12*	12*	11**				17*	17*	10
Academic Major and Career Choice																		
Academic Major: Undecided							-09*	-10*	-11**									
Career: Undecided	13**	13**	12**															
Student Involvement Measures																		
Enrollment: Full-time				28**	28**	23**	31**	30**	21**	16**	16**	12*	61**	61**	57**	39**	37**	37**
Part-time Job: Off Campus										-11*	-15**	-12*	-24**	-21**	-20**			
Held Full-time Job							-25**	-17**	-17**	-14**	-12*	-13*	-26**	-14**	-14**			
Student-Student Social Involvement				-10*	-14*	-14*												
Student-Faculty Interaction				29**	20**	20**				13**	12*	12*	14**	11*	11*			
Average College Grades	21**	18**	18**	31**	18**	15*	30**	21**	21**	18**	13**	13**						
R		35			48			46			39			67			43	
R^2		12			23			21			16			45			18	

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

Notes: Decimals omitted from coefficients.

Institution A = Highly selective public university with a low range persistence rate, *N*=257.

Institution B = Medium selective public four-year college with a low range persistence rate, *N*=206.

Institution C = Low selective private university with a moderate range persistence rate, *N*=541.

Institution D = Medium selective private university with a moderate range persistence rate, *N*=363.

Institution E = Very highly selective nonsectarian four-year college with a high range persistence rate, *N*=205.

Institution F = Low selective private university with a high range persistence rate, *N*=179.

a low range persistence rate (37.6%). Institution B was a medium selective, public four-year college with a low range persistence rate (35.4%). Institution C was a low selective, private university with a moderate range persistence rate (65.6%). Institution D was a medium selective, private university with a moderate range persistence rate (59.5%). Institution E was a very highly selective, nonsectarian four-year college with a high range persistence rate (84.9%). Institution F was a low selective, private university with a high range persistence rate (71.5%). Appendix D, Tables D.1 to D.6 present the means and standard deviations for all the variables for each institution. Appendix D, Tables D.7 to D.12 present the full regression analyses for each institution. It should be noted the institutional environment measures (control, selectivity) become meaningless in the regression analyses at the institutional level. These measures become constants since each student receives the same value.

It is evident from Table 5.15 that no single pattern of predictors emerged from the multiple regression analyses across the institutions and that there was considerable variability. The number of predictors entering a regression equation ranged from 3 at Institution F to 8 at Institution D. A total of 16 variables entered the regression equation for the overall sample. The multiple correlation ranged from R=.35 at Institution A to R=.67 at Institution E, and therefore, the amount of variance accounted for in explaining student persistence ranged from 12% to 45%. The

amount of variance accounted for in the multiple regression analysis for the overall sample was 23%.

Some interesting trends did emerge from these analyses, however. Consistent with the persistence literature some variables tended to emerge as significant predictors with some consistency. In the precollege student characteristics block, average high school grades showed up in 4 of 6 analyses and commitment to college completion emerged in 3 of 6 analyses. In the student involvement measures block, enrollment: full-time was extremely powerful emerging in 5 of 6 analyses. This variable was the most powerful predictor in the overall sample as well. Average college grades entered the regression equation in 4 of 6 analyses. Student-faculty interaction was a predictor in 3 of 6 analyses. Full-time employment was associated with decreased chances of persisting in 3 of 6 analyses.

The measures of being undecided did not emerge as consistent predictors across the institutions (see academic major and career choice block). Being undecided about academic major choice was associated with decreased chances of persisting at Institution C. However, being undecided about career choice was a positive predictor of persistence at Institution A. It appears that these findings add to the often conflicting picture surrounding undecided students and their persistence. In one instance, undecided students were less likely to persist. In another institution undecided students were more likely to persist.

Some general insights into predicting student persistence can be gleaned from these analyses. Certainly there is a place for the single, multiple regression analysis carried out earlier with thousands of students attending hundreds of institutions. As Tinto (1986) has stated:

> tracing out the direct and indirect effects that formal organizational structures have on student retention and of isolating how informal structures (e.g., peer subcultures) serve to mediate and sometimes to alter the intended impact of formal administrative decisions.....requires, however, that we carry out many more multi-institutional comparative studies of student departure [persistence]. Only through carefully drawn comparisons between institutions or settings of different organizational attributes can we come to understand the multidimensional impacts that settings have on student retention. (pp. 378-379)

However, studies of persistence at individual institutions are also extremely important in adding to the understanding of student persistence behavior. Tinto further stated:

> Rather than relying [exclusively] on large databases drawn from many institutions...we need to carefully select a few institutions from which we sample a much larger number of students. Only in that way can we expect to tease out the complex patterns of interactions that are likely to describe the experiences of different students in different institutional settings. (p. 379)

In many ways, it is understandable that so much of student persistence/attrition remains unexplained and that the variables that contribute to persistence can be quite different from college to college. The variables acting on students that potentially affect persistence are almost limitless. These variables vary in intensity and type and the impact of these variables vary from person to person and from group to group. Some students will have many variables acting either for or

against them, while others will have few. Demands and difficulties vary from institution to institution (e.g., graduation requirements, grading practices, support services, expectations, curricula). Individual and group differences must be taken into account, as well as institutional differences. This complex picture presents an ever shifting array of dynamics and interactions. As Anderson (1985) has stated so appropriately:

> Identifying the exact cause of a particular behavior (in this case attrition) is complicated. There is seldom a single cause for any human behavior; rather the causes are multiple and interrelated. We look at attrition as a caused event, yet there is no single factor responsible for it. Instead, a complex mesh of causal factors, forces, or obstacles is responsible. (pp. 51-52)

CHAPTER 6

SUMMARY AND CONCLUSIONS

This study has examined the differences between undecided and decided students and the impact of being undecided on college student persistence. This final chapter is divided into five main sections. The first section provides an overview of the study including its limitations, the second section presents a summary of the findings, the third section discusses implications for policy and practice, and the fourth section suggests directions for future research.

Overview and Limitations of the Study

Overview

This study had five major goals:

1. To examine the differences between students undecided about *academic major* choice and those who are decided.
2. To examine the differences between students undecided about *career* choice and those who are decided.
3. To examine the persistence of undecided students utilizing a national, longitudinal database and college impact theory.

4. To examine whether being undecided contributes anything to the explanation of college student persistence.

5. To dispel or support the widely held belief that undecided students are attrition prone.

The data source for the study was drawn from a national sample of institutions and students who participated in the Cooperative Institutional Research Program (CIRP). In 1985, over 275,000 freshmen completed the CIRP's *Student Information Form* survey. In 1989, about 27,000 of these students completed the CIRP's *Follow-Up Survey*. These two surveys resulted in a broad array of longitudinal data including: student's background characteristics, high school experiences, educational and vocational aspirations, attitudinal orientations, expectations regarding their collegiate careers, actual collegiate experiences, measures of values and self-esteem, and measures of educational achievement.

In assessing differences between undecided and decided students two basic statistical techniques were employed, the *t-test* and the *chi-square* test. In examining the impact of being undecided on college student persistence, the fundamental logic of Astin's Input-Environment-Outcome (I-E-O) model was used to guide the analyses. This longitudinal I-E-O research design is based on the premise that any assessment of college impact must take into consideration three important components: student inputs, the college environment, and student outcomes. The I-E-O analysis was performed using stepwise multiple regression. The results were interpreted utilizing

procedures suggested by Astin (1991). The procedure involves close examination of the standardized regression coefficients (*Betas*) at each step of the regression analysis, carefully observing how intercorrelations among the independent variables affect their relationships with the dependent variable. In addition, the *Betas* provide a picture of the relative predictive power of an independent variable in contributing to the explanation of the dependent variable.

Limitations

Studying undecided students can be like trying to hit a moving target. The problem comes in trying to come up with a strict definition of undecided. It is well-documented in this study that undecided students have been defined in a variety of ways. This study chose to define students as undecided based on the selection of that choice on a survey (CIRP *SIF*). Because there is no basis for lumping all these "types" of undecided students into a group, the results of this study are really only generalizable to the population that self-reports being undecided as they enter college.

This study shares a limitation with others that are based upon data from mail surveys; low rates of response. It is not known how the data might be affected by a higher response rate. Although sophisticated weighting strategies have been devised to adjust for nonresponse, a systematic study of the differences between weighted and unweighted data is beyond the scope of this study.

This study was complicated by a theoretical problem as well. Some of the student involvement measures (independent variables) can also be viewed as dependent variables. Astin (1991) has called such variables "intermediate outcomes." While this is not a technical problem *per se*, it does pose an interpretive one. For example, does participation in an honors program contribute to the explanation of persistence or do certain precollege student characteristics predispose a student to participate? In addition, the longer a student is in an institution, the greater the opportunities for academic and social involvement. Some care must be exercised in interpreting the effects of these variables.

This study was based on a considerable amount of self-reported information, the accuracy of which cannot be fully verified. However, self-reports (both positive and negative) have been found to be generally reliable over time, particularly where assurances of anonymity are employed.

The sample was limited to one particular college cohort, the entering class of 1985 at four-year colleges and universities. Minority students were not well-represented. Older, returning students and two-year college students were not represented at all. The results of this study are generalizable only to the traditional freshmen who enter four-year colleges and universities directly out of high school.

Independent (control) variables were selected on the basis of theory and previous research findings, in order to take into account variables found to be consistently associated with persistence. However, since all potentially biasing

influences can never be completely controlled, it must be acknowledged that any conclusions about the effects of being undecided on persistence must be tempered with an understanding that the results might be different if other independent variables were controlled. Additionally, a non-experimental design was used and the data were correlational. It should be recognized that there is inevitably some risk in drawing causal inferences from the results.

Summary of the Findings

This summary of the findings is presented in three main sections: The differences between undecided and decided students, the impact of being undecided on persistence, and the exploratory analyses. In addition, the hypotheses are repeated here so that they can be referred to as part of the summary.

Hypothesis 1: Students initially **undecided** about *academic major* choice do not differ significantly from **decided** students on precollege student characteristic measures.

Hypothesis 2: Students initially **undecided** about *academic major* choice do not differ significantly from **decided** students on student involvement measures.

Hypothesis 3: Students initially **undecided** about *career* choice do not differ significantly from **decided** students on precollege student characteristic measures.

Hypothesis 4: Students initially **undecided** about *career* choice do not differ significantly from **decided** students on student involvement measures.

After accounting for precollege student characteristics, institutional environment characteristics, and student involvement measures found to be significantly associated with college student persistence:

Hypothesis 5: Being initially **undecided** about *academic major* choice does not contribute significantly to the explanation of persistence.

Hypothesis 6: Being initially **undecided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 7: Being initially **undecided** about *academic major* choice and **undecided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 8: Being initially **undecided** about *academic major* choice and **decided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 9: Being initially **decided** about *academic major* choice and **undecided** about *career* choice does not contribute significantly to the explanation of persistence.

Hypothesis 10: Being initially **decided** about *academic major* choice and **decided** about *career* choice does not contribute significantly to the explanation of persistence.

Differences Between Undecided and Decided Students

The analyses comparing undecided students to decided students produced several statistically significant differences for the precollege student characteristics measures. In all, the two groups were found to be different on 8 of 10 measures and so hypotheses 1 and 3 were not statistically supported. Undecided students were more frequently female. Whites, Asian-Americans, and Chicanos/Mexican-Americans were more frequently undecided. Decided students had higher degree aspirations and scored higher on the commitment to college completion factor. Differences for four of the variables were in a direction never observed in previous studies. Compared to decided students, undecided students were from families with higher socioeconomic status, and parents with higher educational levels, and achieved higher SAT composite scores. On the measures of high school rank and high school grades, undecided and decided students did not differ.

In examining student involvement measures, only 4 of the 11 variables produced statistically significant differences and so hypotheses 2 and 4 were generally supported. Undecided students had higher average college grades than the decided group and were more likely to have held a part-time job on campus. Decided students had higher student-student academic involvement scores on the average than undecided students and they also more frequently held a full-time job.

Although 12 of the 21 variables produced statistically significant differences between undecided and decided students, close examination of the data revealed that many of these differences were small (see Chapter 5, Tables 5.6-5.9). Statistical significance was achieved due to the large sample size ($N > 20,000$). From a research perspective, most of these differences were not of value in trying to distinguish between undecided and decided students. The research findings of this study suggest that undecided students are not much different from decided students in terms of characteristics as they enter college and for measures of student involvement and achievement during the college experience. These findings suggest that undecided students are not an identifiable, homogenous group. Rather, it appears that undecided students are heterogenous and have backgrounds, abilities, college experiences, and college achievement similar to other college students. Although the previous research findings in this area have often been conflicting and confusing, the findings of this study are generally consistent with the conclusions drawn by most researchers. Most differences found between undecided students and decided students

are few, meaningless, and insignificant. In other words, undecided students are more similar to decided students than different.

The Impact of Being Undecided on Persistence

Consistent with literature and college impact theory, several precollege student characteristics, institutional environment measures, and student involvement measures entered the regression equation as significant predictors of persistence. However, the measures of being undecided about academic major choice and/or career choice did not emerge as significant predictors of college student persistence. In other words, these measures of being undecided were of no value in contributing to the explanation of persistence. Even knowing the most undecided students or the most decided students was of no value in predicting persistence. From the results of these analyses it appears that undecided students are not attrition prone. Hypotheses 5-10 were supported.

This finding that undecided students are not any more likely to drop out than decided students is contrary to most previous research and is inconsistent with the widely held belief and opinion that these students are an attrition prone group. Previous studies failed to take into account the complexities of college student persistence. Instead, they chose to examine a single variable (being undecided) and then concluded that there was a causal link between being undecided and persistence. Although no present model or theory can explain the totality of college student

persistence, clearly this complex phenomenon cannot be explained by any single variable. In many ways, it is not surprising that this study found undecided students not to be attrition prone. After all, it has been demonstrated time and time again that these students are generally not any different from decided students on almost any measure imaginable.

Exploratory Analyses

The purpose of these analyses was to examine how the independent variables contributed to the explanation of persistence at individual institutions with a particular focus on how the measures of being undecided impacted persistence. The results revealed no single pattern of predictors across the institutions and rather considerable variability. Consistent with the literature, a few variables emerged as significant predictors at several institutions (average high school grades, commitment to college completion, full-time enrollment, average college grades, student-faculty interaction, and full-time employment). However, the measures of being undecided failed to emerge in any meaningful way. At one institution being undecided was a positive predictor while at another institution it was a negative predictor. These exploratory analyses of predicting persistence at individual institutions tended to support the findings of the overall sample analysis. That is, undecided students do not appear to be an attrition prone group.

Implications

In many ways it is not surprising that a considerable number of young adults enter higher education uncertain of their educational or career choices and that many change these choices along the way. Being undecided and/or changing plans appear to be naturally occurring phenomena for several reasons.

- Career or vocational choice can be a distant concern at college entry. The potential pool of choices is enormous and "it is commonly thought that the United States has more than 20,000 occupations sufficiently varied to be thought different" (Isaacson, 1977, p. 201). Clearly, the majority of students would have limited knowledge about most of these occupations. In addition, there are varied paths for preparing for occupations. "The U.S. Department of Labor...reported that 42% of the work force (48% with bachelor's degrees) were working in fields not directly related to their field of study" (Grites, 1981, p. 42). Solmon (1977) found that 50% of the graduates changed their career plans after leaving college. Given this information, why should a student at college entry be overly concerned about a career choice?
- The number of potential majors at some institutions is staggering. Some large, public universities have as many as 100 potential fields of study leading to a bachelor's degree. Many students who enter college know little, if anything, about a majority of these options. How can a student make an

informed choice about a field of study with little knowledge about the options available at the time of college entry?

- Students who enter higher education come from high schools that vary enormously in career/educational planning services. Some high schools have comprehensive services while others have none. Most fall in between these extremes. Therefore, students can enter higher education at different levels of the planning process in terms of their education and/or career. How can students who have planned inadequately be prepared to make decisions about their education and/or career?
- Numerous career development theories have been posited (e.g., Holland, Roe, Super). Although each has unique aspects, they all suggest that an individual passes through various stages leading to a vocational choice. Due to individual differences, students who enter college are probably at varying stages in their career development. Some are at the decision stage when they enter college, but many are not.

The data are consistent and almost overwhelming when examining the number of students who enter higher education undecided or who change their choices along the way. It is almost always over 50% of any entering class and finding 75% is not unusual at some institutions. Clearly, the time has come to formally recognize in our policies and practices that the majority of entering students are in an undecided mode. Being undecided is not the exception, but rather the norm.

For most students, initial selections about academic major choice or career choice should be viewed with some skepticism. This is not to say that undecided students should be ignored or dismissed as a group. However, it appears from the results of this study that they do not need to be targeted for retention efforts as an attrition prone group. Perhaps they need to be targeted for services that address their expressed needs. If they express being undecided then it appears they need assistance with decision-making for selecting a major and/or career. Certainly assessing the reasons for indecision could be of value here. For example, knowing a student is undecided because of a lack of information becomes useful in designing strategies and interventions that can assist the student in making decisions. Assessing that a student has a multiplicity of interests may require a different set of strategies and interventions, and so on. The key is that these strategies should be designed to enhance the decision-making process, not to increase retention. Numerous programs and services have been developed to assist undecided students. Unfortunately, they are often couched under retention efforts.

On over simplified example may be useful here. College X has a special program for students who enter the institution undecided. Of course, the program was developed because undecided students were believed to be an attrition prone group. The program features seminars, workshops, faculty advising, and intense career planning with a counselor. These services appear to be on track for assisting the student in making decisions about academic majors and careers. Student Y enters

College X undecided and is referred to the special program. A closer examination of Student Y reveals that she has marginal grades from high school, low admission test scores, not much of a personal commitment to college, lives off campus, and is enrolled part-time. According to the literature, and the results of this study, this student exhibits characteristics of being attrition prone. Now, certainly this student needs assistance with academic major and career selections. However, it seems unreasonable to assume that if Student Y makes some decisions about her academic major and career choices that somehow this will decrease her attrition proneness. It seems unlikely that making these decisions can overcome the significant factors that make her attrition prone. It appears that retention efforts for this student need to focus on other concerns and not on assistance in making decisions about a major and/or career.

Somehow, in focusing on and studying undecided students, being undecided has come to be associated with and even synonymous with lack of commitment to college. Certainly commitment to college completion has been found to be associated with persistence. However, there is no empirical evidence linking indecision to lack of commitment and yet, this view is commonly held among those who teach and advise undecided students. Commitment to college completion is a complex, psychological construct probably influenced by a number of factors such as background, interests, values, goals, etc. It seems ill-advised to conclude that a student lacks commitment to college completion simply because of indecision about

a major or career. If 50-75% of entering students are in some way undecided, it seems unlikely that this many students have a lack of commitment. Staff who work closely with undecided students need to be aware of this. Institutions should make an effort to dispel this view when orienting and training these staff.

As mentioned previously, it is difficult to find a college that does not have a special program or services for undecided students and that many of these are designed as retention efforts. In other words, there are considerable resources and effort poured into assisting undecided students. From an administrative view, this allocation of resources probably makes perfect sense. Undecided students can present a planning nightmare. How can an institution plan the allocation of instructional program resources when the institution has no idea where undecided students might end up in terms of an academic major? It appears that administrators are probably misinformed when it comes to undecided students. The better question is how can an institution plan the allocation of resources when 50-75% of entering students change their majors? As the results of this study suggest, targeting undecided students for retention seems ill-conceived because they are not attrition prone. However, targeting undecided students for assistance in making academic and career choices seems well-conceived. From an administrative view it makes more sense to structure academic/career services for all entering students rather than just those who "declare" being undecided. In this way, choices are more likely to be made in an

orderly and timely manner. This certainly would go a long way toward enhancing the allocation of resources.

Finally, what about students and their parents? There is a stigma attached to being undecided. In many ways, parents are more uneasy about indecision than the students. It is quite obvious that both students and their parents are uninformed or misinformed about being undecided. Colleges can do much to alleviate students' fears about indecision. Through the orientation and counseling process students can and should be informed, and more importantly, assured that being undecided is a quite normal and natural state of mind as they enter college. As Holland and Holland (1977) have stated, "it is more reasonable to assume that most undecided students do not have any special negative characteristics and to treat them accordingly" (p. 413). For parents, colleges cannot do much to alleviate their fears. This is simply because as their children become college students, parents have less and less formal contact with the educational system. Perhaps, the responsibility rests with the high schools for educating parents about the myths and realities of being an undecided student. This is the last place where parents tend to have considerable interaction with the educational system. However, this can only happen if the high school administrators, counselors, and faculty can be convinced that being undecided is not a negative trait, is a naturally occurring phenomenon, and does not contribute to college attrition. A challenge indeed.

In closing, it is useful to consider the following suggestions made by Danis (1989):

> we might effect a significant change that lies squarely within our domain [advising] both for the present and for the immediate future....we could decide to eliminate the term "undecided" from our advising vocabulary, because the word so easily identifies with indecision and carries burdensome connotations....indecision has varied levels and forms demanding differing and often individualized approaches. Rather than throwing students into an "undecided" category, would they, we, and our institutions be better served by the term "exploratory?" The list of situations can be as long as any advisor's daily appointment calendar, but all of these students are, in fact, exploring the possibilities open to them or the choices that remain to them. The shift from "undecided" to "exploratory" might appear as subtle word play, but it would reach the core of our vision of students and would enable them to see that vision for themselves. We all know that a society focused on the future is a society with hope, and if our institutions and our students can engage the higher education experience as one of exploration, as one of finding as much certainty as humanly possible in an uncertain world, our mutual task will take on a more forward-looking focus. (p.4)

This bold and creative suggestion makes considerable sense in light of our understanding of undecided students. This suggestion also has the potential to radically alter how undecided students are perceived in higher education. However, the term "undecided" is so entrenched in higher education it is unlikely to disappear any time soon.

Future Research

This study has suggested several areas for future research, the first of which has to do with other groups of undecided students. The sample for this study, and

most others as well, consisted of students who entered four-year colleges and universities directly out of high school as 18 and 19 year-olds. In addition, the overwhelming majority of students were white. Not much is known about undecided students at two-year colleges. The two-year college has considerably more minority students as well as older, returning students. Research focusing on the two-year college cohort would increase our understanding of minority students who enter college undecided and the older, returning student who is undecided. Another group of students who deserve attention are those who change their major/career choices after entering the institution. This is a much larger group than those who enter and formally "declare" being undecided. Other than the number that they comprise, not much is known about these changers. Additionally, we know very little about students who are undecided as upperclassmen (junior and senior level). Being undecided at this stage of the educational process appears to be the most problematic. Questions arise about completing a degree in a reasonable time frame. Planning courses in which to enroll becomes difficult after lower-division requirements have been fulfilled. Future research with this group seems the most intriguing.

Previous research on undecided student persistence has identified students as undecided (however defined) at the time of college entry and then followed-up later (one year, two years, four years, etc.) to determine persistence. What has been lacking from all these studies is information on when, if at all, students made decisions about educational/vocational choices. When a student decides on an

academic major can have profound influences on progress toward a degree and attitudes toward completing the objective. Perhaps, students who make their decisions in the first semester are different from those who are still undecided in the fourth semester, although both entered undecided.

It appears that from the review of literature, along with the results of this study, there is not much to be gained in continued research that compares undecided students to decided students. These two groups have been compared over and over again utilizing a wide array of measures. The results have tended to point to the conclusion that these two groups are more similar than different. Even with various definitions of undecided this has been found to be true. Future research along this line will probably not add much to our understanding of undecided students.

Additional research into the persistence of undecided students would be useful. However, future studies need to take into consideration the complexities of college student persistence. Studies that try to attribute persistence to a single variable (being undecided) seem poorly designed and will not contribute to our understanding of undecided students. Studies like the present one represent a new approach to examining the impact of being undecided on persistence. Similar studies with other samples are needed to support the results of this study.

Another important area for future research has to do with answering the following question: "Who is the undecided student?" In actuality, all future research tends to hinge on this area of inquiry. The number of definitions that are utilized

presents a real dilemma. Is it the student who openly expresses this at the time of college entry (e.g., on an admissions form)? Is it the student who changes his/her major during the college experience? Is it the student who fits a profile based on scores from an instrument or scale? Is it the student who expresses uncertainty about a particular choice? Clearly, these can be different groups of students. Perhaps, the undecided student is all of these in which case almost all entering students fit into one of these categories. On the other hand, the undecided student might be none of these which leads to the next area of potential future research.

Despite considerable research efforts, our understanding of the origins and antecedents of indecision remain fuzzy. As Gordon (1984) so aptly points out "there are as many reasons for being undecided as there are students" (p. 75). All evidence thus far points to undecided students being fairly typical college students on the surface (e.g., measures of background, abilities, experiences). Right now there does not seem to be anything unique about being undecided. Perhaps, if we are to continue focusing on these students as a group, we need to find out if there is truly "something" about being undecided. Future research that centers on finding the uniqueness, if any, that distinguishes undecided students would contribute immensely to our understanding of this group. Finding this uniqueness would also assist in the development of a general definition of being undecided. Until this happens, all research will continue to be with "types" of undecided students based on whatever definition is employed. The research on undecided students will continue to be

conflicting and confusing. In other words, making generalizations about these students will continue to be difficult.

Finally, this study alluded to the issue of potential differences in institutional practices, policies, and attitudes toward undecided students. Some institutions are extremely supportive, while others are indifferent or even nonsupportive. These approaches appear to have the potential to profoundly influence students' willingness to declare being undecided. Additionally, these approaches can influence the college experiences of undecided students. Ultimately, these approaches might influence the persistence of undecided students. This study attempted to get at the impact of this institutional approach to dealing with undecided students with a rather crude measure. Future research that focuses on uncovering these institutional differences might add to our understanding of undecided students and their persistence.

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APPENDIX A

1985 STUDENT INFORMATION FORM (SIF)

273944

PLEASE PRINT YOUR NAME First Middle or Maiden Last

When were you born? Month (01 12) Day (01 31) Year

HOME STREET ADDRESS

CITY STATE ZIP CODE ( ) Area Code Home Phone No

1986 STUDENT INFORMATION FORM

DIRECTIONS

Your responses will be read by an optical mark reader. Your careful observance of these few simple rules will be most appreciated.

- Use only black lead pencil (No. 2 is ideal).
- Make heavy black marks that fill the circle.
- Erase cleanly any answer you wish to change.
- Make no stray markings of any kind.

EXAMPLE:

Will marks made with ballpoint or felt-tip marker be properly read? Yes . . ○ No . . ●

Dear Student:

The information in this form is being collected as part of a continuing study of higher education conducted jointly by the American Council on Education and the University of California at Los Angeles. Your voluntary participation in this research is being solicited in order to achieve a better understanding of how students are affected by their college experiences. Detailed information on the goals and design of this research program are furnished in research reports available from the Higher Education Research Institute at UCLA. Identifying information has been requested in order to make subsequent mail follow-up studies possible. Your response will be held in the strictest professional confidence.

PLEASE USE #2 PENCIL

Sincerely, Alexander W. Astin

Alexander W. Astin, Director
Higher Education Research Institute

MARK IN THIS AREA ONLY IF DIRECTED | GRP. CODE

1. Your sex: Male . . ○ Female . . ○

2. How old will you be on December 31 of this year? (Mark one)
   - 16 or younger . . . ○
   - 17 . . . ○
   - 18 . . . ○
   - 19 . . . ○
   - 20 . . . ○
   - 21-24 . . . ○
   - 25-29 . . . ○
   - 30-39 . . . ○
   - 40-54 . . . ○
   - 55 or older . . ○

3. Are you a twin? (Mark one)
   - No . . . ○
   - Yes, identical . . ○
   - Yes, fraternal . . ○

4. In what year did you graduate from high school? (Mark one)
   - 1985 . . . ○
   - 1984 . . . ○
   - 1983 . . . ○
   - 1982 or earlier . ○
   - Did not graduate but passed G E D test . ○
   - Never completed high school . . ○

5. Are you enrolled (or enrolling) as a: (Mark one)
   - Full-time student? . . ○
   - Part-time student? . . ○

(Note: Please check that your pencil markings are completely darkening the circles. Do not use pen or make ✓'s or X 's. Thank you.)

6. Where did you get the money to pay for college this year? (Write in actual dollar amounts; write "0" if none)
   - Grants and scholarships . $
   - All loans . . . $
   - Work or savings . . . $
   - Parents and/or spouse . $
   - Other sources . . . $

7a. How many persons are currently dependent on your parents for support (include yourself and your parents, if applicable)?
1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 or more ○

7b. How many of these dependents other than yourself are currently attending college?
None ○ 1 ○ 2 ○ 3 or more ○

8. What was your average grade in high school? (Mark one)
A or A+ ○ B ○ C ○
A- ○ B- ○ D ○
B+ ○ C+ ○

9. Where did you rank academically in your high school graduating class? (Mark one)
   - Top 20% . . . ○
   - Second 20% . . ○
   - Middle 20% . . ○
   - Fourth 20% . . ○
   - Lowest 20% . . ○

10. Are you: (Mark one)
   - Not presently married . . . ○
   - Married, living with spouse . . . ○
   - Married, not living with spouse . . . ○

11. Prior to this term, have you ever taken courses for credit at this institution?
Yes . . . ○ No . . . ○

12. Since leaving high school, have you ever taken courses at any other institution? (Mark all that apply in each column)

	For Credit	Not for Credit
No	○	○
Yes, at a junior or comty college	○	○
Yes, at a four-year college or university	○	○
Yes, at some other postsecondary school (For ex., technical, vocational, business)	○	○

13. What is the highest academic degree that you intend to obtain? (Mark one in each column)

	Highest Planned	Highest Planned at this College
None	○	○
Vocational certificate	○	○
Associate (A.A. or equivalent)	○	○
Bachelor's degree (BA, BS, etc.)	○	○
Master's degree (MA, MS, etc.)	○	○
Ph.D. or Ed.D.	○	○
M.D., D.O., D.D.S., or D.V.M	○	○
LL.B., or J.D. (Law)	○	○
B.D. or M.DIV. (Divinity)	○	○
Other	○	○

14. Where do you plan to live during the fall term? If you had a choice, where would you have preferred to live? (Mark one in each column)

	Plan To Live	Prefer To Live
With parents or relatives	○	○
Other private home, apt or rm	○	○
College dormitory	○	○
Fraternity or sorority house	○	○
Other campus student housing	○	○
Other	○	○

15. Is this college your: (Mark one)
   - First choice? . . ○
   - Second choice? . ○
   - Third choice? . . ○
   - Less than third choice? . . . ○

16. How many miles is this college from your permanent home? (Mark one)
5 or less ○ 11-50 ○ 101-500 ○
6-10 ○ 51-100 ○ More than 500 ○

17. To how many colleges other than this one did you apply for admission this year?
No other ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 or more ○

Note: If you applied to no other college skip to item 19 on the next page

18. How many other acceptances did you receive this year? (Mark one)
None ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 or more ○

19. How much of your first year's educational expenses (room, board, tuition, and fees) do you expect to cover from each of the sources listed below? (Mark one answer for each possible source)

	None	$1-$499	$500-$999	$1,000-$1,499	$1,500-$1,999	$2,000-$3,000	Over $3,000
a. My Own or Family Resources							
Parents, other relatives or friends	○	○	○	○	○	○	○
Spouse	○	○	○	○	○	○	○
Savings from summer work	○	○	○	○	○	○	○
Other savings	○	○	○	○	○	○	○
Full-time job while in college	○	○	○	○	○	○	○
Part-time job while in college	○	○	○	○	○	○	○
b. Aid Which Need Not Be Repaid							
Pell Grant	○	○	○	○	○	○	○
Supplemental Educational Opportunity Grant	○	○	○	○	○	○	○
State Scholarship or Grant	○	○	○	○	○	○	○
College Work-Study Grant	○	○	○	○	○	○	○
College Grant/Scholarship (other than above)	○	○	○	○	○	○	○
Corporate Tuition Assistance	○	○	○	○	○	○	○
Other private grant	○	○	○	○	○	○	○
Your GI benefits	○	○	○	○	○	○	○
Your parent's GI benefits	○	○	○	○	○	○	○
Other government aid (ROTC, BIA, Social Security, etc.)	○	○	○	○	○	○	○
c. Aid Which Must Be Repaid							
Federal Guaranteed Student Loan	○	○	○	○	○	○	○
National Direct Student Loan	○	○	○	○	○	○	○
Other College Loan	○	○	○	○	○	○	○
Other Loan	○	○	○	○	○	○	○
d. Other Than Above	○	○	○	○	○	○	○

If you are receiving any form of aid indicated in sections b or c, please answer Question No. 20. Otherwise go on to Question 21.

20. Was the aid you are receiving awarded on the basis of:

(Mark all that apply)	Yes	No
Academic merit	○	○
Financial need	○	○
Athletic talent	○	○
Other talent (music, art, etc.)	○	○
Other	○	○

21. Were you last year, or will you be this year:

	1984 Yes	1984 No	1985 Yes	1985 No
Living with your parents (for more than five consecutive weeks)	Ⓨ	Ⓝ	Ⓨ	Ⓝ
Listed as a dependent on your parents' Federal Income Tax Return	Ⓨ	Ⓝ	Ⓨ	Ⓝ
Receiving assistance worth $600 or more from your parents	Ⓨ	Ⓝ	Ⓨ	Ⓝ

22. Are you: (Mark all that apply)

- White/Caucasian ○
- Black/Negro/Afro-American ○
- American Indian ○
- Asian-American/Oriental ○
- Mexican-American/Chicano ○
- Puerto Rican-American ○
- Other ○

23. Are you a U.S. citizen? ○ Yes ○ No

24. For the activities below, indicate which ones you did during the past year. If you engaged in an activity frequently, mark Ⓕ. If you engaged in an activity one or more times, but not frequently, mark Ⓞ (occasionally). Mark Ⓝ (not at all) if you have not performed the activity during the past year. (Mark one for each item)

	Frequently	Occasionally	Not at all
Used a personal computer	Ⓕ	Ⓞ	Ⓝ
Played a musical instrument	Ⓕ	Ⓞ	Ⓝ
Attended a religious service	Ⓕ	Ⓞ	Ⓝ
Participated in a speech or debate contest	Ⓕ	Ⓞ	Ⓝ
Elected president of one or more student organizations	Ⓕ	Ⓞ	Ⓝ
Was bored in class	Ⓕ	Ⓞ	Ⓝ
Had a major part in a play	Ⓕ	Ⓞ	Ⓝ
Won a varsity letter for sports	Ⓕ	Ⓞ	Ⓝ
Failed to complete a homework assignment on time	Ⓕ	Ⓞ	Ⓝ
Won a prize or award in an art competition	Ⓕ	Ⓞ	Ⓝ
Edited the school paper, yearbook, or literary magazine	Ⓕ	Ⓞ	Ⓝ
Tutored another student	Ⓕ	Ⓞ	Ⓝ
Asked a teacher for advice after class	Ⓕ	Ⓞ	Ⓝ
Participated in a science contest	Ⓕ	Ⓞ	Ⓝ
Did extra (unassigned) work/reading for a course	Ⓕ	Ⓞ	Ⓝ
Was a guest in a teacher's home	Ⓕ	Ⓞ	Ⓝ
Studied with other students	Ⓕ	Ⓞ	Ⓝ
Overslept and missed a class or appointment	Ⓕ	Ⓞ	Ⓝ
Smoked cigarettes	Ⓕ	Ⓞ	Ⓝ
Performed volunteer work	Ⓕ	Ⓞ	Ⓝ
Missed school because of illness	Ⓕ	Ⓞ	Ⓝ
Attended a recital or concert	Ⓕ	Ⓞ	Ⓝ
Drank beer	Ⓕ	Ⓞ	Ⓝ
Stayed up all night	Ⓕ	Ⓞ	Ⓝ
Felt overwhelmed by all I had to do	Ⓕ	Ⓞ	Ⓝ
Felt depressed	Ⓕ	Ⓞ	Ⓝ

25. Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself. (Mark one in each row)

	Highest 10%	Above Average	Average	Below Average	Lowest 10%
Academic ability	○	○	○	○	○
Artistic ability	○	○	○	○	○
Drive to achieve	○	○	○	○	○
Emotional health	○	○	○	○	○
Leadership ability	○	○	○	○	○
Mathematical ability	○	○	○	○	○
Physical health	○	○	○	○	○
Popularity	○	○	○	○	○
Self-confidence (intellectual)	○	○	○	○	○
Self-confidence (social)	○	○	○	○	○
Writing ability	○	○	○	○	○

26. In deciding to go to college, how important to you was each of the following reasons?

(Mark one answer for each possible reason)

	Very important	Somewhat important	Not important
To be able to get a better job	Ⓥ	Ⓢ	Ⓝ
To gain a general education and appreciation of ideas	Ⓥ	Ⓢ	Ⓝ
To improve my reading and study skills	Ⓥ	Ⓢ	Ⓝ
There was nothing better to do	Ⓥ	Ⓢ	Ⓝ
To make me a more cultured person	Ⓥ	Ⓢ	Ⓝ
To be able to make more money	Ⓥ	Ⓢ	Ⓝ
To learn more about things that interest me	Ⓥ	Ⓢ	Ⓝ
To prepare myself for graduate or professional school	Ⓥ	Ⓢ	Ⓝ
My parents wanted me to go	Ⓥ	Ⓢ	Ⓝ
I could not find a job	Ⓥ	Ⓢ	Ⓝ
Wanted to get away from home	Ⓥ	Ⓢ	Ⓝ

27. Do you have any concern about your ability to finance your college education? (Mark one)

- None (I am confident that I will have sufficient funds) ○
- Some concern (but I will probably have enough funds) ○
- Major concern (not sure I will have enough funds to complete college) ○

28. How would you characterize your political views? (Mark one)

- Far left ○
- Liberal ○
- Middle-of-the-road ○
- Conservative ○
- Far right ○

29. What is your best estimate of your parents' total income last year? Consider income from all sources before taxes. (Mark one)

○ Less than $6,000	○ $35,000-39,999
○ $6,000-9,999	○ $40,000-49,999
○ $10,000-14,999	○ $50,000-59,999
○ $15,000-19,999	○ $60,000-74,999
○ $20,000-24,999	○ $75,000-99,999
○ $25,000-29,999	○ $100,000-149,999
○ $30,000-34,999	○ $150,000 or more

30. What is the highest level of formal education obtained by your parents? (Mark one in each column)

	Father	Mother
Grammar school or less	○	○
Some high school	○	○
High school graduate	○	○
Postsecondary school other than college	○	○
Some college	○	○
College degree	○	○
Some graduate school	○	○
Graduate degree	○	○

31. Mark only three responses, one in each column.

(M) Your mother's occupation
(F) Your father's occupation
(Y) Your probable career occupation

NOTE: If your father or mother is deceased, please indicate his or her last occupation.

	Y	F	M
Accountant or actuary	Y	F	M
Actor or entertainer	Y	F	M
Architect or urban planner	Y	F	M
Artist	Y	F	M
Business (clerical)	Y	F	M
Business executive (management, administrator)	Y	F	M
Business owner or proprietor	Y	F	M
Business salesperson or buyer	Y	F	M
Clergyman (minister, priest)	Y	F	M
Clergy (other religious)	Y	F	M
Clinical psychologist	Y	F	M
College teacher	Y	F	M
Computer programmer or analyst	Y	F	M
Conservationist or forester	Y	F	M
Dentist (including orthodontist)	Y	F	M
Dietician or home economist	Y	F	M
Engineer	Y	F	M
Farmer or rancher	Y	F	M
Foreign service worker (including diplomat)	Y	F	M
Homemaker (full-time)	Y	F	M
Interior decorator (including designer)	Y	F	M
Interpreter (translator)	Y	F	M
Lab technician or hygienist	Y	F	M
Law enforcement officer	Y	F	M
Lawyer (attorney) or judge	Y	F	M
Military service (career)	Y	F	M
Musician (performer, composer)	Y	F	M
Nurse	Y	F	M
Optometrist	Y	F	M
Pharmacist	Y	F	M
Physician	Y	F	M
School counselor	Y	F	M
School principal or superintendent	Y	F	M
Scientific researcher	Y	F	M
Social, welfare or recreation worker	Y	F	M
Statistician	Y	F	M
Therapist (physical, occupational, speech)	Y	F	M
Teacher or administrator (elementary)	Y	F	M
Teacher or administrator (secondary)	Y	F	M
Veterinarian	Y	F	M
Writer or journalist	Y	F	M
Skilled trades	Y	F	M
Other	Y		
Undecided	Y		
Laborer (unskilled)		F	M
Semi-skilled worker		F	M
Other occupation		F	M
Unemployed		F	M

32. Below are some reasons that might have influenced your decision to attend this particular college. How important was each reason in your decision to come here? (Mark one answer for each possible reason)

	Very important	Somewhat important	Not important
My relatives wanted me to come here.	V	S	N
My teacher advised me	V	S	N
This college has a very good academic reputation	V	S	N
This college has a good reputation for its social activities	V	S	N
I was offered financial assistance.	V	S	N
This college offers special educational programs	V	S	N
This college has low tuition	V	S	N
My guidance counselor advised me	V	S	N
I wanted to live near home	V	S	N
A friend suggested attending	V	S	N
A college rep. recruited me	V	S	N
The athletic dept. recruited me	V	S	N
This college's graduates gain admission to top graduate/ professional schools	V	S	N
This college's graduates get good jobs.	V	S	N
Not offered financial aid by first choice college	V	S	N

33. Do you have a disability? (Mark all that apply)

None	○	Learning disability	○
Hearing	○	Health-related	○
Speech	○	Partially sighted or blind	○
Orthopedic	○	Other	○

BE SURE TO ANSWER QUESTIONS 34, 35, AND 36

34. Current religious preference: (Mark one in each column)

	Yours	Father's	Mother's
Baptist	Y	F	M
Buddhist	Y	F	M
Congregational (U.C.C)	Y	F	M
Eastern Orthodox	Y	F	M
Episcopal	Y	F	M
Islamic	Y	F	M
Jewish	Y	F	M
Latter Day Saints (Mormon)	Y	F	M
Lutheran	Y	F	M
Methodist	Y	F	M
Presbyterian	Y	F	M
Quaker (Society of Friends)	Y	F	M
Roman Catholic	Y	F	M
Seventh Day Adventist	Y	F	M
Other Protestant	Y	F	M
Other Religion	Y	F	M
None	Y	F	M

35. Are you a born-again Christian?

Yes. . ○ No. . ○

36. During high school (grades 9-12) how many years did you study each of the following subjects? (Mark one for each item)

	None	½	1	2	3	4	5 or more
English	0	½	1	2	3	4	5
Mathematics	0	½	1	2	3	4	5
Foreign Language	0	½	1	2	3	4	5
Physical Science	0	½	1	2	3	4	5
Biological Science	0	½	1	2	3	4	5
History/Am. Govt.	0	½	1	2	3	4	5
Computer Science	0	½	1	2	3	4	5
Art and/or Music	0	½	1	2	3	4	5

37. Mark one in each row:

(1) Disagree Strongly
(2) Disagree Somewhat
(3) Agree Somewhat
(4) Agree Strongly

	4	3	2	1
The Federal government is not doing enough to protect the consumer from faulty goods and services	4	3	2	1
The Federal government is not doing enough to promote disarmament	4	3	2	1
The Federal government is not doing enough to control environmental pollution	4	3	2	1
The Federal government should do more to discourage energy consumption	4	3	2	1
The Federal government should raise taxes to help reduce the deficit	4	3	2	1
Federal military spending should be increased	4	3	2	1
Nuclear disarmament is attainable	4	3	2	1
The death penalty should be abolished	4	3	2	1
A national health care plan is needed to cover everybody's medical costs	4	3	2	1
Abortion should be legalized	4	3	2	1
Grading in the high schools has become too easy	4	3	2	1
The activities of married women are best confined to the home and family	4	3	2	1
A couple should live together for some time before deciding to get married	4	3	2	1
Women should receive the same salary and opportunities for advancement as men in comparable positions	4	3	2	1
Wealthy people should pay a larger share of taxes than they do now	4	3	2	1
Marijuana should be legalized	4	3	2	1
Busing is O.K. if it helps to achieve racial balance in the schools	4	3	2	1
It is important to have laws prohibiting homosexual relationships	4	3	2	1
College officials have the right to regulate student behavior off-campus	4	3	2	1
Faculty promotions should be based in part on student evaluations	4	3	2	1
College officials have the right to ban persons with extreme views from speaking on campus	4	3	2	1
Realistically, an individual person can do little to bring about changes in our society	4	3	2	1
The chief benefit of a college education is that it increases one's earning power	4	3	2	1

38. Below is a list of different undergraduate major fields grouped into general categories. Mark only one circle to indicate your probable field of study.

ARTS AND HUMANITIES
- Art, fine and applied
- English (language and literature)
- History
- Journalism
- Language and Literature (except English)
- Music
- Philosophy
- Speech
- Theater or Drama
- Theology or Religion
- Other Arts and Humanities

BIOLOGICAL SCIENCE
- Biology (general)
- Biochemistry or Biophysics
- Botany
- Marine (Life) Science
- Microbiology or Bacteriology
- Zoology
- Other Biological Science

BUSINESS
- Accounting
- Business Admin. (general)
- Finance
- Marketing
- Management
- Secretarial Studies
- Other Business

EDUCATION
- Business Education
- Elementary Education
- Music or Art Education
- Physical Education or Recreation
- Secondary Education
- Special Education
- Other Education

ENGINEERING
- Aeronautical or Astronautical Eng.
- Civil Engineering
- Chemical Engineering
- Electrical or Electronic Engineering
- Industrial Engineering
- Mechanical Engineering
- Other Engineering

PHYSICAL SCIENCE
- Astronomy
- Atmospheric Science (incl. Meteorology)
- Chemistry
- Earth Science
- Marine Science (incl. Oceanography)
- Mathematics
- Physics
- Statistics
- Other Physical Science

PROFESSIONAL
- Architecture or Urban Planning
- Home Economics
- Health Technology (medical, dental, laboratory)
- Library or Archival Science
- Nursing
- Pharmacy
- Predental, Premedicine, Preveterinary
- Therapy (occupational, physical, speech)
- Other Professional

SOCIAL SCIENCE
- Anthropology
- Economics
- Ethnic Studies
- Geography
- Political Science (gov't., international relations)
- Psychology
- Social Work
- Sociology
- Women's Studies
- Other Social Science

TECHNICAL
- Building Trades
- Data Processing or Computer Programming
- Drafting or Design
- Electronics
- Mechanics
- Other Technical

OTHER FIELDS
- Agriculture
- Communications (radio, TV, etc.)
- Computer Science
- Forestry
- Law Enforcement
- Military Science
- Other Field
- Undecided

Prepared by the Higher Education Research Institute, University of California, Los Angeles, California 90024.

39. Indicate the importance to you personally of each of the following: (Mark one for each item) (E) Essential (V) Very Important (S) Somewhat Important (N) Not Important

- Becoming accomplished in one of the performing arts (acting, dancing, etc.) — E V S N
- Becoming an authority in my field — E V S N
- Obtaining recognition from my colleagues for contributions to my special field — E V S N
- Influencing the political structure — E V S N
- Influencing social values — E V S N
- Raising a family — E V S N
- Having administrative responsibility for the work of others — E V S N
- Being very well off financially — E V S N
- Helping others who are in difficulty — E V S N
- Making a theoretical contribution to science — E V S N
- Writing original works (poems, novels, short stories, etc.) — E V S N
- Creating artistic work (painting, sculpture, decorating, etc.) — E V S N
- Being successful in a business of my own — E V S N
- Becoming involved in programs to clean up the environment — E V S N
- Developing a meaningful philosophy of life — E V S N
- Participating in a community action program — E V S N
- Helping to promote racial understanding — E V S N
- Becoming an expert on finance and commerce — E V S N

40. What is your best guess as to the chances that you will: (Mark one for each item) (V) Very Good Chance (S) Some Chance (L) Very Little Chance (N) No Chance

- Change major field? — V S L N
- Change career choice? — V S L N
- Fail one or more courses? — V S L N
- Graduate with honors? — V S L N
- Be elected to a student office? — V S L N
- Get a job to help pay for college expenses? — V S L N
- Work full time while attending college? — V S L N
- Join a social fraternity, sorority, or club? — V S L N
- Live in a coeducational dorm? — V S L N
- Play varsity/intercollegiate athletics? — V S L N
- Be elected to an academic honor society? — V S L N
- Make at least a "B" average? — V S L N
- Need extra time to complete your degree requirements? — V S L N
- Get tutoring help in specific courses? — V S L N
- Have to work at an outside job during college? — V S L N
- Seek vocational counseling? — V S L N
- Seek individual counseling on personal problems? — V S L N
- Get a bachelor's degree (B.A., B.S., etc.)? — V S L N
- Participate in student protests or demonstrations? — V S L N
- Drop out of this college temporarily (exclude transferring)? — V S L N
- Drop out permanently (exclude transferring)? — V S L N
- Transfer to another college before graduating? — V S L N
- Be satisfied with your college? — V S L N
- Find a job after college in the field for which you were trained? — V S L N
- Get married while in college? (skip if married) — V S L N
- Get married within a year after college? (skip if married) — V S L N

The Higher Education Research Institute at UCLA actively encourages the colleges that participate in this survey to conduct local studies of their students. If these studies involve collecting follow-up data, it is necessary for the institution to know the students' ID numbers so that follow-up data can be linked with the data from this survey. If your college asks for a tape copy of the data and signs an agreement to use it only for research purposes, do we have your permission to include your ID number in such a tape? Yes. ○ No. ○

41. A B C D E
42. A B C D E
43. A B C D E
44. A B C D E
45. A B C D E

The remaining circles are provided for items specifically designed by your college, rather than by the Higher Education Research Institute. If your college has chosen to use the circles, observe carefully the supplemental directions given you.

THANK YOU!

46. A B C D E
47. A B C D E
48. A B C D E
49. A B C D E
50. A B C D E

APPENDIX B

1989 FOLLOW-UP SURVEY (FUS) OF 1985 COLLEGE FRESHMEN

UNIVERSITY OF CALIFORNIA, LOS ANGELES UCLA

BERKELEY · DAVIS · IRVINE · LOS ANGELES · RIVERSIDE · SAN DIEGO · SAN FRANCISCO SANTA BARBARA · SANTA CRUZ

HIGHER EDUCATION RESEARCH INSTITUTE

GRADUATE SCHOOL OF EDUCATION
405 HILGARD AVENUE
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(213) 825-1925

FOLLOW-UP SURVEY OF COLLEGE FRESHMEN

June, 1989

You may recall that when you first entered college you participated in a national research project by completing a questionnaire at the beginning of your freshman year. We are now conducting a new survey to follow-up students who responded to this freshman survey in 1985 and 1987. We want to know about your experiences over the past few years, especially your experiences in college. The results of this survey will help to improve higher education programs at campuses across the country.

We ask that you help us by completing the enclosed questionnaire and returning it in the enclosed postage reply envelope. *Please complete the questionnaire even if you withdrew from college or changed schools.* We are very interested in learning about your experiences in college, no matter how long you attended. The information you provide is confidential and will be used only in group comparisons for research purposes.

Some of the colleges that participated in the original freshman surveys have asked us to include additional questions designed specifically for their students. If your college is among this group, you will find an additional page with supplemental questions enclosed in this envelope. Please mark your answers to these supplemental questions at the end of the survey form, as directed. Again, please be assured that your responses are confidential and will be used only for research.

We will be pleased to send you a summary of the findings when they become available. Just mark the appropriate box on the questionnaire.

Your participation is very important to the success of this project. We thank you in advance for your assistance and cooperation.

Sincerely,

Alexander W. Astin

Alexander W. Astin
Professor and Director

DIRECTIONS:

Your responses will be read by an optical mark reader. Your observance of these few directions will be most appreciated.

- Use only a black lead pencil (No. 2 is ideal).
- Make heavy black marks that fill the oval.
- Erase cleanly any answer you wish to change.
- Make no stray markings of any kind.

EXAMPLE: Will marks made with a ball-point or felt-tip pen be properly read?

○ Yes ● No 

1. If you could make your college choice over again, would you still choose to enroll at the college you entered as a freshman?

○ Definitely yes ○ Probably not ○ Don't know
○ Probably I would ○ Definitely not

2. Since entering college have you:

	YES	NO
Enrolled in honors or advanced courses	Ⓨ	Ⓝ
Enrolled in an interdisciplinary course	Ⓨ	Ⓝ
Joined or been a member of a fraternity or sorority	Ⓨ	Ⓝ
Gotten married	Ⓨ	Ⓝ
Had a part-time job on campus	Ⓨ	Ⓝ
Had a part-time job off campus	Ⓨ	Ⓝ
Worked full-time while attending school	Ⓨ	Ⓝ
Participated in a study abroad program	Ⓨ	Ⓝ
Participated in a college internship program	Ⓨ	Ⓝ
Participated in campus protests/demonstrations	Ⓨ	Ⓝ
Been elected to a student office	Ⓨ	Ⓝ
Voted in the 1988 election	Ⓨ	Ⓝ
Graduated with honors	Ⓨ	Ⓝ
Taken reading/study skills classes	Ⓨ	Ⓝ
Participated in intercollegiate athletics	Ⓨ	Ⓝ
Worked on a professor's research project	Ⓨ	Ⓝ
Played intercollegiate football or basketball	Ⓨ	Ⓝ
Taken remedial or developmental courses	Ⓨ	Ⓝ
Purchased a personal computer	Ⓨ	Ⓝ
Enrolled in an ethnic studies course	Ⓨ	Ⓝ
Enrolled in a women's studies course	Ⓨ	Ⓝ
Assisted faculty in teaching a course	Ⓨ	Ⓝ
Attended a racial/cultural awareness workshop	Ⓨ	Ⓝ

3. Which option listed below best describes your enrollment status each year since you entered college?

(Mark one in each column)

	YEAR 1	2	3	4
Attended my first college full-time	①	②	③	④
Attended my first college part-time	①	②	③	④
Attended a different college full-time	①	②	③	④
Attended a different college part-time	①	②	③	④
Not enrolled	①	②	③	④

4. Your sex: Male... ○ Female... ○

5. Which option listed below best describes where you lived during each year you attended college?

(Mark one in each column)

	YEAR 1	2	3	4
With parents or relatives	①	②	③	④
Other private home, apartment, room	①	②	③	④
College dormitory	①	②	③	④
Fraternity or sorority house	①	②	③	④
Other campus student housing	①	②	③	④
Other	①	②	③	④

6. Since entering college as a freshman, have you taken a leave of absence, withdrawn from school, or transferred to another college? (If more than one applies, mark only the most recent)

○ No → Please go to question 8.
○ Took a leave of absence
○ Withdrew from school
○ Transferred before completing my program

} Please answer Question 7

7. How important were each of the reasons listed below in your decision to take a leave of absence, withdraw from school, or transfer?

(Mark one answer for each reason)

	Very Important	Somewhat Important	Not Important
Wanted to reconsider my goals and interests	Ⓥ	Ⓢ	Ⓝ
Changed my career plans	Ⓥ	Ⓢ	Ⓝ
Wanted practical experience	Ⓥ	Ⓢ	Ⓝ
Didn't feel like I "fit in" at my first college	Ⓥ	Ⓢ	Ⓝ
Was bored with my coursework	Ⓥ	Ⓢ	Ⓝ
Wanted to go to a school with a better academic reputation	Ⓥ	Ⓢ	Ⓝ
Wanted a better social life	Ⓥ	Ⓢ	Ⓝ
Wanted to be closer to home	Ⓥ	Ⓢ	Ⓝ
Had a good job offer	Ⓥ	Ⓢ	Ⓝ
Wasn't doing as well academically as I had expected	Ⓥ	Ⓢ	Ⓝ
Family responsibilities	Ⓥ	Ⓢ	Ⓝ
Tired of being a student	Ⓥ	Ⓢ	Ⓝ
Had money problems and could no longer afford to attend college	Ⓥ	Ⓢ	Ⓝ
Wanted to go to a school that offered a wider selection of courses or more major field choices	Ⓥ	Ⓢ	Ⓝ

8. What do you plan to be doing in the fall of 1989?
(Mark all that apply)

○ Attending undergraduate college full-time
○ Attending undergraduate college part-time
○ Attending graduate or professional school
○ Attending a vocational training program
○ Working full-time
○ Working part-time
○ Serving in the Armed Forces
○ Traveling, hosteling, or backpacking
○ Doing volunteer work
○ Staying at home to be with (or start) my family

9. Mark the one circle that best describes your undergraduate grade average.

○ A (3.75-4.0)
○ A-, B+ (3.25-3.74)
○ B (2.75-3.24)
○ B-, C+ (2.25-2.74)
○ C (1.75-2.24)
○ C- or less (below 1.75)

10. Please rate your satisfaction with the college you entered as a freshman on each of the aspects of campus life listed below.

(Mark one for each item)

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Can't Rate - No Experience
Science and mathematics courses					
Humanities courses					
Social science courses					
Courses in your major field					
General education requirements					
Relevance of coursework to everyday life					
Overall quality of instruction					
Laboratory facilities and equipment					
Library facilities					
Computer facilities					
Opportunities to take interdisciplinary courses					
Opportunities to discuss coursework and assignments outside of class with professors					
Opportunities to participate in extracurricular activities					
Campus social life					
Regulations governing campus life					
Tutorial help or other academic assistance					
Academic advising					
Career counseling and advising					
Personal counseling					
Student housing					
Financial aid services					
Amount of contact with faculty and administrators					
Overall relationships with faculty and administrators					
On-campus opportunities to attend films, concerts, etc.					
Job placement services for students					
Campus health services					
Overall college experience					

11. Compared with when you entered college as a freshman, how would you now describe your:

(Mark one for each item)

	Much Stronger	Stronger	No Change	Weaker	Much Weaker
General knowledge					
Analytical and problem-solving skills					
Knowledge of a particular field or discipline					
Ability to think critically					
Writing skills					
Foreign language skills					
Job-related skills					
Religious beliefs and convictions					
Interest in pursuing a graduate/professional degree					
Preparation for graduate or professional school					
Leadership abilities					
Ability to work independently					
Interpersonal skills					
Cultural awareness and appreciation					
Acceptance of persons from different races/cultures					
Competitiveness					
Confidence in your academic abilities					
Public speaking ability					
Ability to work cooperatively					

12. Indicate the importance to you personally of each of the following:

(Mark one for each item)

	Essential	Very Important	Somewhat Important	Not Important
Becoming accomplished in one of the performing arts (acting, dancing, etc.)				
Becoming an authority in my field				
Obtaining recognition from my colleagues for contributions to my special field				
Influencing the political structure				
Influencing social values				
Raising a family				
Having administrative responsibility for the work of others				
Being very well off financially				
Helping others who are in difficulty				
Making a theoretical contribution to science				
Writing original works (poems, novels, short stories, etc.)				
Creating artistic work (painting, sculpture, decorating, etc.)				
Being successful in a business of my own				
Becoming involved in programs to clean up the environment				
Developing a meaningful philosophy of life				
Participating in a community action program				
Helping to promote racial understanding				
Becoming an expert on finance and commerce				

13. How many undergraduate courses have you taken that emphasized:

(Mark one for each item)

	None	1-2 Courses	3-5 Courses	6-9 Courses	10 or More Courses
Writing skills					
Math/Understanding numerical data					
Science/Scientific Inquiry					
History/Historical Analysis					
Foreign language skills					

14. Indicate how well each of the following describes the college you entered as a freshman.

(Mark one for each item)

	Very Descriptive	Somewhat Descriptive	Not Descriptive
It is easy to see faculty outside of office hours			
There is a great deal of conformity among the students			
Most of the students are very bright			
The administration is open about its policies			
There is keen competition among most of the students for high grades			
Course work is definitely more theoretical than practical			
Faculty are rewarded for their advising skills			
Students have little contact with each other outside of class			
The faculty are typically at odds with the campus administration			
Intercollegiate sports are overemphasized			
The classes are usually informal			
Faculty here respect each other			
Most students are treated like "numbers in a book"			
Social activities are overemphasized			
There is little or no contact between students and faculty			
The student body is apathetic and has little "school spirit"			
Students here do not usually socialize with one another			
Faculty are rewarded for being good teachers			

15. Please indicate your agreement with each of the following statements.

(Mark one for each item)

	Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly
The Federal government is not doing enough to promote disarmament	1	2	3	4
The Federal government is not doing enough to control environmental pollution	1	2	3	4
The Federal government should raise taxes to help reduce the deficit	1	2	3	4
The death penalty should be abolished	1	2	3	4
A national health care plan is needed to cover everybody's medical costs	1	2	3	4
Abortion should be legalized	1	2	3	4
Grading in colleges has become too easy	1	2	3	4
The activities of married women are best confined to the home and family	1	2	3	4
Women should receive the same salary and opportunities for advancement as men in comparable positions	1	2	3	4
Wealthy people should pay a larger share of taxes than they do now	1	2	3	4
Marijuana should be legalized	1	2	3	4
Busing is O.K. if it helps to achieve racial balance in the schools	1	2	3	4
College officials have the right to regulate student behavior off campus	1	2	3	4
College officials have the right to ban persons with extreme views from speaking on campus	1	2	3	4
Realistically, an individual person can do little to bring about changes in our society	1	2	3	4
The chief benefit of a college education is that it increases one's earning power	1	2	3	4
Racial discrimination is no longer a major problem in America	1	2	3	4
Colleges should be actively involved in solving social problems	1	2	3	4
The best way to control the spread of AIDS is through widespread mandatory testing	1	2	3	4
Just because a man feels a woman has "led him on" does not entitle him to have sex with her	1	2	3	4

16. Below are some statements about the college you entered as a freshman. Indicate the extent to which you agree or disagree.

(Mark one for each item)

	Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly
Faculty here are interested in students' personal problems	1	2	3	4
Most faculty here are sensitive to the issues of minorities	1	2	3	4
The curriculum here has suffered from faculty over-specialization	1	2	3	4
Many students feel like they do not "fit in" on this campus	1	2	3	4
Faculty are committed to the welfare of this institution	1	2	3	4
Many courses include minority group perspectives	1	2	3	4
Administrators consider student concerns when making policy	1	2	3	4
Faculty here are strongly interested in the academic problems of undergraduates	1	2	3	4
There is a lot of campus racial conflict here	1	2	3	4
Students here resent taking required courses outside their major	1	2	3	4
Students of different racial/ethnic origins communicate well with one another	1	2	3	4
Campus administrators care little about what happens to students	1	2	3	4
There is little trust between minority student groups and campus administrators	1	2	3	4
Faculty here are positive about the general education program	1	2	3	4
Many courses include feminist perspectives	1	2	3	4
There are many opportunities for faculty and students to socialize with one another	1	2	3	4
Administrators consider faculty concerns when making policy	1	2	3	4
Faculty feel that most students here are well-prepared academically	1	2	3	4

17. During your last year in college, how much time did you spend during a typical week doing the following activities?

(Mark one for each item)

	Hours Per Week								
	None	Less than 1 hour	1-2	3-5	6-10	11-15	16-20	Over 20
Classes/labs	1	2	3	4	5	6	7	8
Studying/homework	1	2	3	4	5	6	7	8
Socializing with friends	1	2	3	4	5	6	7	8
Talking with faculty outside of class	1	2	3	4	5	6	7	8
Exercising/sports	1	2	3	4	5	6	7	8
Reading for pleasure	1	2	3	4	5	6	7	8
Using a personal computer	1	2	3	4	5	6	7	8
Partying	1	2	3	4	5	6	7	8
Working (for pay)	1	2	3	4	5	6	7	8
Volunteer work	1	2	3	4	5	6	7	8
Student clubs/groups	1	2	3	4	5	6	7	8
Watching TV	1	2	3	4	5	6	7	8
Commuting to campus	1	2	3	4	5	6	7	8
Religious services/meetings	1	2	3	4	5	6	7	8
Hobbies	1	2	3	4	5	6	7	8

18. For the activities listed below, please indicate how often—Frequently, Occasionally, or Not at all—you engaged in each during the past year.

(Mark one for each item)

	Frequently	Occasionally	Not at all
Worked on an independent research project	1	2	3
Discussed course content with students outside of class	1	2	3
Worked on group projects for a class	1	2	3
Been a guest in a professor's home	1	2	3
Took a multiple-choice exam	1	2	3
Tutored another student	1	2	3
Smoked cigarettes	1	2	3
Felt depressed	1	2	3
Felt overwhelmed by all I had to do	1	2	3
Stayed up all night	1	2	3
Gave a presentation in class	1	2	3
Participated in intramural sports	1	2	3
Discussed racial/ethnic issues	1	2	3
Attended a recital or concert	1	2	3
Missed classes because of illness	1	2	3
Felt like leaving college	1	2	3
Failed to complete a homework assignment on time	1	2	3
Drank beer	1	2	3
Drank wine or liquor	1	2	3
Received career/vocational counseling	1	2	3
Received personal/psychological counseling	1	2	3
Participated in campus protests/demonstrations	1	2	3
Took an essay exam	1	2	3
Received tutoring in courses	1	2	3
Read the student newspaper	1	2	3
Socialized with someone of another racial/ethnic group	1	2	3
Discussed political/social issues	1	2	3
Had a class paper critiqued by an instructor	1	2	3

19. Please indicate (A) the highest degree you have earned as of June 1989 and (B) the highest degree you plan to complete.

(Mark one in each column)

	Highest Degree Earned	Highest Degree Planned
None	A	B
Vocational certificate	A	B
Associate's degree (A.A. or equivalent)	A	B
Bachelor's degree (B.A., B.S., etc.)	A	B
Master's degree (M.A., M.S., etc.)	A	B
Ph.D. or Ed.D.	A	B
MD., D.O., D.D.S., or D.V.M.	A	B
LL.B., or J.D. (Law)	A	B
B.D. or M.DIV. (Divinity)	A	B
Other	A	B

20. How would you characterize your political views?

(Mark one)

- Far left ○
- Liberal ○
- Middle-of-the-road ○
- Conservative ○
- Far right ○

21. Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself.

(Mark one for each item)

	Highest 10%	Above Average	Average	Below Average	Lowest 10%
Academic ability	○	○	○	○	○
Artistic ability	○	○	○	○	○
Drive to achieve	○	○	○	○	○
Emotional health	○	○	○	○	○
Leadership ability	○	○	○	○	○
Mathematical ability	○	○	○	○	○
Physical health	○	○	○	○	○
Popularity	○	○	○	○	○
Self-confidence (intellectual)	○	○	○	○	○
Self-confidence (social)	○	○	○	○	○
Writing ability	○	○	○	○	○
Listening ability	○	○	○	○	○

22. Your current religious preference: (Mark one)

- Baptist ○
- Buddhist ○
- Congregational (UCC) ○
- Eastern Orthodox ○
- Episcopal ○
- Islamic ○
- Jewish ○
- Latter Day Saints (Mormon) ○
- Lutheran ○
- Methodist ○
- Presbyterian ○
- Quaker ○
- Roman Catholic ○
- Seventh Day Adventist ○
- Other Protestant ○
- Other Religion ○
- None ○

23. Are you a born-again Christian? ○ Yes ○ No

24. Are you: (Mark one)

- Not presently married ○
- Married, living with spouse ○
- Married, not living with spouse ○

25. Please mark your probable career/occupation below: (Mark one)

- Accountant or actuary ○
- Actor or entertainer ○
- Architect or urban planner ○
- Artist ○
- Business (clerical) ○
- Business executive (management, administrator) ○
- Business owner or proprietor ○
- Business salesperson or buyer ○
- Clergy (minister, priest) ○
- Clergy (other religious) ○
- Clinical psychologist ○
- College teacher ○
- Computer programmer or analyst ○
- Conservationist or forester ○
- Dentist (including orthodontist) ○
- Dietitian or home economist ○
- Engineer ○
- Farmer or rancher ○
- Foreign service worker (including diplomat) ○
- Homemaker (full-time) ○
- Interior decorator (including designer) ○
- Interpreter (translator) ○
- Lab technician or hygienist ○
- Law enforcement officer ○
- Lawyer (attorney) or judge ○
- Military service (career) ○
- Musician (performer, composer) ○
- Nurse ○
- Optometrist ○
- Pharmacist ○
- Physician ○
- School counselor ○
- School principal or superintendent ○
- Scientific researcher ○
- Social, welfare or recreation worker ○
- Statistician ○
- Therapist (physical, occupational, speech) ○
- Teacher or administrator (elementary) ○
- Teacher or administrator (secondary) ○
- Veterinarian ○
- Writer or journalist ○
- Skilled trades ○
- Other ○
- Undecided ○

26. How important are each of the following reasons for your career choice or career preference?

(Mark one for each item)

	Essential	Very Important	Somewhat Important	Not Important
Job opportunities are generally available	1	2	3	4
I enjoy working with the kind of people involved in this field	1	2	3	4
The work would be interesting	1	2	3	4
This is a well-paying career	1	2	3	4
This choice satisfies my parents' hopes	1	2	3	4
The work would be challenging	1	2	3	4
I feel this enables me to make a contribution to society	1	2	3	4
There are opportunities for rapid career advancement	1	2	3	4
There are opportunities for freedom of action	1	2	3	4

27. Indicate how important you believe each priority listed below is at the college or university you entered as a freshman.

(Mark one for each item)

	Highest Priority	High Priority	Medium Priority	Low Priority
To promote the intellectual development of students	1	2	3	4
To help students examine and understand their personal values	1	2	3	4
To increase the representation of minorities in the faculty and administration	1	2	3	4
To develop a sense of community among students and faculty	1	2	3	4
To develop leadership ability among students	1	2	3	4
To conduct basic and applied research	1	2	3	4
To raise money for the institution	1	2	3	4
To develop leadership ability among faculty	1	2	3	4
To increase the representation of women in the faculty and administration	1	2	3	4
To facilitate student involvement in community service activities	1	2	3	4
To help students learn how to bring about change in American society	1	2	3	4
To help solve major social and environmental problems	1	2	3	4
To maintain a campus climate where differences of opinion can be aired openly	1	2	3	4
To increase or maintain institutional prestige	1	2	3	4
To develop among students and faculty an appreciation for a multi-cultural society	1	2	3	4
To hire faculty "stars"	1	2	3	4
To economize and cut costs	1	2	3	4
To recruit more minority students	1	2	3	4
To enhance the institution's national image	1	2	3	4
To create a positive undergraduate experience	1	2	3	4
To create a diverse multi-cultural environment on campus	1	2	3	4

28. Below is a list of different major fields. (Mark only one in each column)

(1) Undergraduate major (final or most recent)
(2) Graduate major (omit if you do not plan to go to graduate school)

ARTS AND HUMANITIES
- Art, fine and applied
- English (language and literature)
- History
- Journalism
- Language and Literature (except English)
- Music
- Philosophy
- Speech
- Theater or Drama
- Theology or Religion
- Other Arts and Humanities

BIOLOGICAL SCIENCE
- Biology (general)
- Biochemistry or Biophysics
- Botany
- Marine (Life) Science
- Microbiology or Bacteriology
- Zoology
- Other Biological Science

BUSINESS
- Accounting
- Business Administration (general)
- Finance
- Marketing
- Management
- Secretarial Studies
- Other Business

EDUCATION
- Business Education
- Elementary Education
- Music or Art Education
- Physical Education or Recreation
- Secondary Education
- Special Education
- Other Education

ENGINEERING
- Aeronautical or Astronautical Engineering
- Civil Engineering
- Chemical Engineering
- Electrical or Electronic Engineering
- Industrial Engineering
- Mechanical Engineering
- Other Engineering

PHYSICAL SCIENCE
- Astronomy
- Atmospheric Science (incl. Meteorology)
- Chemistry
- Earth Science
- Marine Science (incl. Oceanography)
- Mathematics
- Physics
- Statistics
- Other Physical Science

PROFESSIONAL
- Architecture or Urban Planning
- Home Economics
- Health Technology (medical, dental, laboratory)
- Law
- Library/Archival Science
- Nursing
- Pharmacy
- Predental, Premedicine, Preveterinary
- Therapy (occupational, physical, speech)
- Other Professional

SOCIAL SCIENCE
- Anthropology
- Economics
- Ethnic Studies
- Geography
- Political Science (gov't., international relations)
- Psychology
- Social Work
- Sociology
- Women's Studies
- Other Social Science

TECHNICAL
- Building Trades
- Data Processing or Computer Programming
- Drafting or Design
- Electronics
- Mechanics
- Other Technical

OTHER FIELDS
- Agriculture
- Communications (radio, TV, etc.)
- Computer Science
- Forestry
- Law Enforcement
- Military Science
- Other Field
- Undecided

29. If you have attended more than one undergraduate college, please write in the name and location of the current (or most recent) college attended. (Please print)

Institution _____ State _____

30. If you have been admitted to a graduate or professional school, please write in the name of the institution and its location. (Please print)

Institution _____ State _____

31. Please provide the following information about your scores on the tests listed below:

GRE: Verbal ☐☐☐ GRE: Quantitative ☐☐☐

LSAT ☐☐☐ MCAT ☐☐

32. Would you like to receive a copy of the results of this survey?

○ Yes ○ No

33. The Higher Education Research Institute at UCLA actively encourages the colleges that participate in this survey to conduct local studies of their students. If your college asks for a tape copy of the data and signs an agreement to use it only for research purposes, do we have your permission to include your ID number in such a tape?

○ Yes ○ No

34. Please provide your Social Security Number:

⓪	⓪	⓪	⓪	⓪	⓪	⓪	⓪	⓪
①	①	①	①	①	①	①	①	①
②	②	②	②	②	②	②	②	②
③	③	③	③	③	③	③	③	③
④	④	④	④	④	④	④	④	④
⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨	⑨	⑨	⑨	⑨

ADDITIONAL QUESTIONS: If you received an additional page of questions, please mark your answers below:

35.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	42.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	49.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
36.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	43.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	50.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
37.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	44.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	51.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
38.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	45.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	52.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
39.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	46.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	53.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
40.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	47.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	54.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
41.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	48.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ						

55. Please update the name and address information printed on the front page of this questionnaire:

First Name: _____ MI: ☐

Last Name: _____

Street Address: _____

City: _____

State: ☐☐ ZIP Code: ☐☐☐☐☐

Area Code: ☐☐☐ Phone: ☐☐☐-☐☐☐☐

Birthdate: Month: ☐☐ Day: ☐☐ Year: ☐☐

THANK YOU!

Please return your completed questionnaire in the postage-paid envelope to:

Higher Education Research Institute
2905 W. Service Rd.
Eagan, MN 55121

⓪	⓪	⓪	⓪	⓪	⓪
①	①	①	①	①	①
②	②	②	②	②	②
③	③	③	③	③	③
④	④	④	④	④	④
⑤	⑤	⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨	⑨
①	②	③			

2996-Questar/940-54321

APPENDIX C

CORRELATION MATRIX FOR ALL VARIABLES IN THE REGRESSION ANALYSIS FOR THE OVERALL SAMPLE

Table C.1
Correlation Matrix for All Variables in the Regression Analysis for the Overall Sample (N = 12,227)

Variable Name	1	2	3	4	5	6	7	8
1. Gender: Female	1.000	-.015	.041	-.008	-.018	.000	-.004	-.034
2. Race: White/Caucasian	-.015	1.000	-.595	-.061	-.581	-.283	-.100	.049
3. Race: Black/Afro-American	.041	-.595	1.000	.061	-.034	-.012	.013	-.074
4. Race: American Indian	-.008	-.061	.061	1.000	.004	-.044	.053	-.001
5. Race: Asian-American	-.018	-.581	-.034	-.004	1.000	-.002	.001	.056
6. Race: Mexican-American	.000	-.283	-.012	.044	-.002	1.000	.017	-.093
7. Race: Puerto-Rican	-.004	-.100	.013	.053	.001	.017	1.000	-.024
8. Father's Education Level	-.034	.049	-.074	-.001	.056	-.093	-.024	1.000
9. Mother's Education Level	-.013	.010	.006	.006	.035	-.091	-.023	.601
10. Socioeconomic Status	-.052	.073	-.079	-.004	.031	-.100	-.022	.810
11. High School Rank	.043	.016	-.094	-.002	.062	.007	.009	.047
12. High School Grades	.066	.017	-.121	.000	.088	.002	.004	.089
13. SAT Composite Score	-.191	.072	-.186	-.002	.116	-.049	-.011	.307
14. Degree Aspirations	-.051	-.133	.066	.006	.110	.028	.016	.211
15. Control: Private	.001	-.044	.044	.001	.022	.007	-.001	.164
16. Institutional Selectivity	-.105	.011	-.167	.006	.149	-.003	.005	.317
17. Undecidedness Norm	-.020	.033	-.140	.005	.083	-.009	-.004	.255
18. Commitment to College	.062	-.027	.013	-.010	.022	.018	.012	-.014
19. Enrollment: Full-time	-.012	.015	-.028	-.012	.009	-.004	-.013	.049
20. Housing: On Campus	-.044	-.016	.025	.014	.012	-.019	-.002	.106
21. Academic Major: Undecided	.058	.022	-.033	-.008	-.004	-.006	-.005	.056
22. Career: Undecided	.068	.056	-.053	.005	-.020	-.017	-.006	.080
23. Dec. Major/Und. Career	-.070	-.047	.051	.000	.011	.019	.008	-.082
24. Und. Major/Und. Career	.056	.035	-.036	-.002	-.017	-.003	-.002	.053
25. Und. Major/Dec. Career	.037	.042	-.036	.008	-.011	-.019	-.006	.055
26. Dec. Major/Und. Career	.016	-.017	-.002	-.011	.022	-.007	-.007	.018
27. Honors Program	-.038	.005	-.028	-.007	.032	-.013	-.014	.140
28. Part-time Job: On Campus	.053	-.039	.011	-.011	.030	.017	.004	.002
29. Part-time Job: Off Campus	.076	.000	.011	.005	-.023	.008	.014	-.101
30. Held Full-time Job	-.003	-.003	.026	.011	-.024	.012	.007	-.108
31. Student-Student Academic Involvement	-.019	.039	.006	-.004	-.045	-.013	-.016	.026
32. Student-Student Social Involvement	-.098	.039	-.023	-.019	-.029	-.021	-.021	.072
33. Student Leadership/Political Involvement	.026	-.033	.056	-.009	.000	-.016	.002	.096
34. Student-Faculty Interaction	.039	-.013	.032	-.002	-.001	-.022	.003	.080
35. Average College Grades	.065	.094	-.133	-.018	.021	-.053	.002	.122
36. Persistence	.027	.052	-.046	.000	-.011	-.036	-.018	.115

Table C.1 - continued

Variable Name	9	10	11	12	13	14	15	16
1. Gender: Female	-.013	-.052	.043	.066	-.191	-.051	.001	-.105
2. Race: White/Caucasian	.010	.073	.016	.017	.072	-.133	-.044	.011
3. Race: Black/Afro-American	.006	-.079	-.094	-.121	-.186	.066	.044	-.167
4. Race: American Indian	.006	-.004	-.002	.000	-.002	.006	.001	.006
5. Race: Asian-American	.035	.031	.062	.088	.116	.110	.022	.149
6. Race: Mexican-American	-.091	-.100	.007	.002	-.049	.028	.007	-.033
7. Race: Puerto-Rican	-.023	-.022	.009	.004	-.011	.016	-.001	.005
8. Father's Education Level	.601	.810	.047	.089	.307	.211	.164	.317
9. Mother's Education Level	1.000	.743	.040	.079	.269	.217	.157	.279
10. Socioeconomic Status	.743	1.000	.010	.046	.313	.216	.184	.348
11. High School Rank	.040	.010	1.000	.689	.401	.139	.034	.258
12. High School Grades	.079	.046	.689	1.000	.491	.203	.098	.317
13. SAT Composite Score	.269	.313	.401	.491	1.000	.299	.197	.597
14. Degree Aspirations	.217	.216	.139	.203	.299	1.000	.210	.301
15. Control: Private	.157	.184	.034	.098	.197	.210	1.000	.262
16. Institutional Selectivity	.279	.348	.258	.317	.597	.301	.262	1.000
17. Undecidedness Norm	.228	.276	.172	.177	.393	.237	.319	.695
18. Commitment to College	-.024	-.005	.035	.041	-.047	.060	-.015	-.038
19. Enrollment: Full-time	.048	.049	.119	.140	.100	.024	.042	.077
20. Housing: On Campus	.118	.100	.110	.151	.209	.115	.224	.273
21. Academic Major: Undecided	.060	.054	-.002	-.004	.057	-.034	.025	.071
22. Career: Undecided	.081	.084	.011	.003	.084	-.061	.045	.103
23. Dec. Major/Und. Career	-.085	-.085	-.009	-.002	-.092	.046	-.050	-.115
24. Und. Major/Und. Career	.056	.051	-.001	-.003	.045	-.057	.017	.054
25. Und. Major/Dec. Career	.054	.062	.015	.007	.068	-.028	.043	.085
26. Dec. Major/Und. Career	.022	.016	-.003	-.002	.033	.032	.020	.046
27. Honors Program	.140	.141	.172	.236	.303	.232	.145	.186
28. Part-time Job: On Campus	.022	-.085	.100	.112	.120	.096	.138	.148
29. Part-time Job: Off Campus	-.106	-.116	-.086	-.112	-.155	-.043	-.063	-.190
30. Held Full-time Job	-.080	-.123	-.071	-.102	-.106	-.014	-.037	-.151
31. Student-Student Academic Involvement	.022	.030	.039	.061	-.018	-.003	.014	-.067
32. Student-Student Social Involvement	.061	.102	.048	.064	.050	.048	.028	.043
33. Student Leadership/Political Involvement	.114	.112	.082	.105	.136	.152	.118	.117
34. Student-Faculty Interaction	.091	.066	.048	.077	.050	.164	.165	.065
35. Average College Grades	.103	.111	.351	.473	.385	.131	.151	.147
36. Persistence	.095	.122	.146	.176	.169	.087	.242	.237

Table C.1 - continued

Variable Name	17	18	19	20	21	22	23	24
1. Gender: Female	-.020	.062	-.012	-.044	.058	.068	-.070	.056
2. Race: White/Caucasian	.033	-.027	.015	-.016	.022	.056	-.047	.035
3. Race: Black/Afro-American	-.140	.013	-.028	.025	-.033	-.053	.051	-.036
4. Race: American Indian	.005	-.010	-.012	.014	-.088	.005	.000	-.002
5. Race: Asian-American	.083	.022	.009	.012	-.004	-.020	.011	-.017
6. Race: Mexican-American	-.009	.018	-.004	-.019	-.006	-.017	.019	-.003
7. Race: Puerto-Rican	-.004	.012	-.013	-.002	-.005	-.006	.008	-.002
8. Father's Education Level	.255	-.014	.049	.106	.056	.080	-.082	.053
9. Mother's Education Level	.228	-.024	.048	.118	.060	.081	-.085	.056
10. Socioeconomic Status	.276	-.005	.049	.100	.054	.084	-.085	.051
11. High School Rank	.172	.035	.119	.110	-.002	.011	-.009	-.001
12. High School Grades	.177	.041	.140	.151	-.004	.003	-.002	-.003
13. SAT Composite Score	.393	-.047	.100	.209	.057	.084	-.092	.045
14. Degree Aspirations	.237	.060	.024	.115	-.034	-.061	.046	-.057
15. Control: Private	.319	-.015	.042	.224	.025	.045	-.050	.017
16. Institutional Selectivity	.695	-.038	.077	.273	.071	.103	-.115	.054
17. Undecidedness Norm	1.000	-.061	.052	.215	.114	.160	-.170	.101
18. Commitment to College Completion	-.061	1.000	.037	.022	-.080	-.099	.107	-.072
19. Enrollment: Full-time	.052	.037	1.000	.201	-.001	.002	.003	.005
20. Housing: On Campus	.215	.022	.201	1.000	.020	.024	-.024	.020
21. Academic Major: Undecided	.114	-.080	-.001	.020	1.000	.525	-.674	.864
22. Career: Undecided	.160	-.099	.002	.024	.525	1.000	-.929	.627
23. Dec. Major/Und. Career	-.170	.107	.003	-.024	-.674	-.929	1.000	-.582
24. Und. Major/Und. Career	.101	-.072	.005	.020	.864	.627	-.582	1.000
25. Und. Major/Dec. Career	.116	-.064	-.002	.013	-.083	.732	-.680	-.072
26. Dec. Major/Und. Career	.049	-.033	-.012	.005	.475	-.054	-.320	-.034
27. Honors Program	.176	.005	.077	.125	.015	.025	-.030	.008
28. Part-time Job: On Campus	.174	-.041	.066	.162	.033	.022	-.028	.025
29. Part-time Job: Off Campus	-.167	.009	-.101	-.261	-.022	-.015	.019	-.017
30. Held Full-time Job	-.137	.006	-.227	-.153	-.038	-.042	.050	-.028
31. Student-Student Academic Involvement	-.025	.051	.186	.109	-.022	-.036	.046	-.006
32. Student-Student Social Involvement	.036	.041	.139	.173	-.004	-.020	.023	.002
33. Student Leadership/Political Involvement	.153	.014	.102	.198	.032	.021	-.025	.029
34. Student-Faculty Interaction	.158	.015	.097	.157	.012	.014	-.014	.012
35. Average College Grades	.121	-.029	.156	.101	.025	.046	-.045	.025
36. Persistence	.206	.025	.314	.266	.023	.047	-.052	.016

Table C.1 - continued

Variable Name	25	26	27	28	29	30	31	32
1. Gender: Female	.037	.016	-.038	.053	.076	-.003	-.019	-.098
2. Race: White/Caucasian	.042	-.017	.005	-.039	.000	-.003	.039	.039
3. Race: Black/Afro-American	-.036	-.002	-.028	.011	.011	.026	.006	-.023
4. Race: American Indian	.008	-.011	-.007	-.011	.005	.011	-.004	-.019
5. Race: Asian-American	-.011	.022	.032	.030	-.023	-.024	-.045	-.029
6. Race: Mexican-American	-.019	-.007	-.013	.017	.008	.012	-.013	-.021
7. Race: Puerto-Rican	-.006	-.007	-.014	.004	.014	.007	-.016	-.021
8. Father's Education Level	.055	.018	.140	.002	-.101	-.108	.026	-.072
9. Mother's Education Level	.054	.022	.140	.022	-.106	-.080	.022	.061
10. Socioeconomic Status	.062	.016	.141	-.085	-.116	-.123	.030	.102
11. High School Rank	.015	-.003	.172	.100	-.086	-.071	.039	.048
12. High School Grades	.007	-.002	.236	.112	-.112	-.102	.061	.064
13. SAT Composite Score	.068	.033	.303	.120	-.155	-.106	-.018	.050
14. Degree Aspirations	-.028	.032	.232	.096	-.043	-.014	-.033	.048
15. Control: Private	.043	.020	.145	.138	-.063	-.037	.014	.028
16. Institutional Selectivity	.085	.046	.186	.148	-.190	-.151	-.067	.043
17. Undecidedness Norm	.116	.049	.176	.174	-.167	-.137	-.025	.036
18. Commitment to College Completion	-.064	-.033	.005	-.041	.009	.006	.051	.041
19. Enrollment: Full-time	-.002	-.012	.077	.066	-.101	-.227	.186	.139
20. Housing: On Campus	.013	.005	.125	.162	-.261	-.153	.109	.173
21. Academic Major: Undecided	-.083	.475	.015	.033	-.022	-.038	-.022	-.004
22. Career: Undecided	.732	-.054	.025	.022	-.015	-.042	-.036	-.020
23. Dec. Major/Und. Career	-.680	-.320	-.030	-.028	.019	.050	.046	.023
24. Und. Major/Und. Career	-.072	-.034	.008	.025	-.017	-.028	-.006	.002
25. Und. Major/Dec. Career	1.000	-.039	.025	.005	-.005	-.029	-.040	-.027
26. Dec. Major/Und. Career	-.039	1.000	.016	.021	-.014	-.027	-.033	-.011
27. Honors Program	.025	.016	1.000	.113	-.057	-.030	.096	.057
28. Part-time Job: On Campus	.005	.021	.113	1.000	-.044	-.028	.092	.066
29. Part-time Job: Off Campus	-.005	-.014	-.057	-.044	1.000	.183	-.023	-.095
30. Held Full-time Job	-.029	-.027	-.030	-.028	.183	1.000	-.060	-.105
31. Student-Student Academic Involvement	-.040	-.033	.096	.092	-.023	-.060	1.000	.498
32. Student-Student Social Involvement	-.027	-.011	.057	.066	-.095	-.105	.498	1.000
33. Student Leadership/Political Involvement	.002	.013	.169	.156	-.083	-.092	.393	.766
34. Student-Faculty Interaction	.007	.003	.233	.216	-.063	-.047	.313	.184
35. Average College Grades	.037	.006	.320	.072	-.052	-.113	.094	.009
36. Persistence	.047	.019	.116	.096	-.147	-.201	.152	.170

Table C.1 - continued

Variable Name	33	34	35	36
1. Gender: Female	.026	.039	.065	.027
2. Race: White/Caucasian	-.033	-.013	.094	.052
3. Race: Black/Afro-American	.056	.032	-.133	-.046
4. Race: American Indian	-.009	-.002	-.018	.000
5. Race: Asian-American	.000	-.001	.021	-.011
6. Race: Mexican-American	-.016	-.022	-.053	-.036
7. Race: Puerto-Rican	.002	.003	.002	-.018
8. Father's Education Level	.096	.080	.122	.115
9. Mother's Education Level	.114	.091	.103	.095
10. Socioeconomic Status	.112	.066	.111	.122
11. High School Rank	.082	.048	.351	.146
12. High School Grades	.105	.077	.473	.176
13. SAT Composite Score	.136	.050	.385	.169
14. Degree Aspirations	.152	.164	.131	.087
15. Control: Private	.118	.165	.151	.242
16. Institutional Selectivity	.117	.065	.147	.237
17. Undecidedness Norm	.153	.158	.121	.206
18. Commitment to College Completion	.014	.015	-.029	.025
19. Enrollment: Full-time	.102	.097	.156	.314
20. Housing: On Campus	.198	.157	.101	.266
21. Academic Major: Undecided	.032	.012	.025	.023
22. Career: Undecided	.021	.014	.046	.047
23. Dec. Major/Und. Career	-.025	-.014	-.045	-.052
24. Und. Major/Und. Career	.029	.012	.025	.016
25. Und. Major/Dec. Career	.002	.007	.037	.047
26. Dec. Major/Und. Career	.013	.003	.006	.019
27. Honors Program	.169	.233	.320	.116
28. Part-time Job: On Campus	.156	.216	.072	.096
29. Part-time Job: Off Campus	-.083	-.063	-.052	-.147
30. Held Full-time Job	-.092	-.047	-.113	-.201
31. Student-Student Academic Involvement	.393	.313	.094	.152
32. Student-Student Social Involvement	.766	.184	.009	.170
33. Student Leadership/Political Involvement	1.000	.316	.118	.159
34. Student-Faculty Interaction	.316	1.000	.180	.163
35. Average College Grades	.118	.180	1.000	.187
36. Persistence	.159	.163	.187	1.000

APPENDIX D

DESCRIPTIVE STATISTICS AND REGRESSION TABLES FOR INDIVIDUAL INSTITUTIONS

Table D.1
Means and Standard Deviations for All Variables in the Regression Analysis for Institution A (N = 492)

Variable	*Mean*	*SD*
Precollege Student Characteristics		
Gender: Female	1.598	0.491
Race: White	1.671	0.470
Race: Black/Afro-American	1.020	0.141
Race: American Indian	1.012	0.110
Race: Asian-American	1.232	0.422
Race: Chicano\Mexican-American	1.055	0.228
Race: Puerto-Rican American	1.006	0.078
Father's Educational Level	6.248	1.880
Mother's Educational Level	5.427	1.720
Socioeconomic Status	20.909	5.092
High School Rank	4.896	0.371
High School Grades	7.108	0.900
SAT Composite Score	1060.049	56.220
Degree Aspirations	2.346	0.695
Commitment to College Completion	7.573	0.821
Academic Major Choice/Career Choice		
Academic Major: Undecided	1.073	0.264
Career Choice: Undecided	1.136	0.343
Decided Major/Decided Career	1.837	0.369
Undecided Major/Undecided Career	1.047	0.211
Decided Major/Undecided Career	1.089	0.286
Undecided Major/Decided Career	1.026	0.161
Student Involvement Measures		
Enrollment: Full-time	1.931	0.254
Living Arrangements: On Campus	1.075	0.264
Enrolled in Honors Program	1.380	0.486
Held Part-time Job: On Campus	1.671	0.470
Held Part-time Job: Off Campus	1.754	0.431
Held Full-time Job	1.134	0.341
Student-Student Academic Involvement	4.748	0.927
Student-Student Social Involvement	3.568	1.309
Student Leadership/Political Involvement	3.325	1.105
Student-Faculty Interaction	3.669	0.769
College Grades	4.409	0.881
Persistence	1.376	0.485

NOTE: Institution A = Highly selective public university with a low range persistence rate.

Table D.2
Means and Standard Deviations for All Variables in the Regression Analysis for Institution B (N = 206)

Variable	*Mean*	*SD*
Precollege Student Characteristics		
Gender: Female	1.553	0.498
Race: White	1.757	0.430
Race: Black/Afro-American	1.010	0.098
Race: American Indian	1.010	0.098
Race: Asian-American	1.180	0.385
Race: Chicano\Mexican-American	1.034	0.182
Race: Puerto-Rican American	1.005	0.070
Father's Educational Level	6.257	2.090
Mother's Educational Level	5.704	1.901
Socioeconomic Status	20.816	5.462
High School Rank	4.495	0.724
High School Grades	6.160	1.059
SAT Composite Score	1048.904	35.065
Degree Aspirations	2.277	0.710
Commitment to College Completion	7.438	1.035
Academic Major Choice/Career Choice		
Academic Major: Undecided	1.102	0.303
Career Choice: Undecided	1.204	0.404
Decided Major/Decided Career	1.777	0.417
Undecided Major/Undecided Career	1.083	0.276
Decided Major/Undecided Career	1.121	0.327
Undecided Major/Decided Career	1.019	0.138
Student Involvement Measures		
Enrollment: Full-time	1.830	0.376
Living Arrangements: On Campus	1.102	0.303
Enrolled in Honors Program	1.568	0.497
Held Part-time Job: On Campus	1.602	0.491
Held Part-time Job: Off Campus	1.675	0.470
Held Full-time Job	1.126	0.333
Student-Student Academic Involvement	5.013	0.922
Student-Student Social Involvement	2.919	1.057
Student Leadership/Political Involvement	3.155	0.992
Student-Faculty Interaction	4.140	1.010
College Grades	4.466	0.945
Persistence	1.354	0.479

NOTE: Institution B = Medium selective public four-year college with a low range persistence rate.

Table D.3
Means and Standard Deviations for All Variables in the Regression Analysis for Institution C (N = 541)

Variable	*Mean*	*SD*
Precollege Student Characteristics		
Gender: Female	1.601	0.490
Race: White	1.950	0.218
Race: Black/Afro-American	1.015	0.121
Race: American Indian	1.009	0.096
Race: Asian-American	1.020	0.141
Race: Chicano\Mexican-American	1.002	0.043
Race: Puerto-Rican American	1.007	0.086
Father's Educational Level	5.543	2.037
Mother's Educational Level	4.795	1.769
Socioeconomic Status	18.562	4.989
High School Rank	4.501	0.698
High School Grades	5.599	1.238
SAT Composite Score	1043.306	66.377
Degree Aspirations	1.945	0.748
Commitment to College Completion	7.530	0.860
Academic Major Choice/Career Choice		
Academic Major: Undecided	1.041	0.198
Career Choice: Undecided	1.113	0.317
Decided Major/Decided Career	1.874	0.332
Undecided Major/Undecided Career	1.028	0.164
Decided Major/Undecided Career	1.085	0.279
Undecided Major/Decided Career	1.013	0.113
Student Involvement Measures		
Enrollment: Full-time	1.860	0.348
Living Arrangements: On Campus	1.187	0.390
Enrolled in Honors Program	1.481	0.500
Held Part-time Job: On Campus	1.686	0.465
Held Part-time Job: Off Campus	1.612	0.488
Held Full-time Job	1.079	0.271
Student-Student Academic Involvement	5.073	0.939
Student-Student Social Involvement	3.379	1.279
Student Leadership/Political Involvement	3.275	1.206
Student-Faculty Interaction	3.950	0.988
College Grades	4.276	0.943
Persistence	1.708	0.455

NOTE: Institution C = Low selection private university with a moderate range persistence rate.

Table D.4
Means and Standard Deviations for All Variables in the Regression Analysis for Institution D (N = 363)

Variable	*Mean*	*SD*
Precollege Student Characteristics		
Gender: Female	1.614	0.487
Race: White	1.959	0.199
Race: Black/Afro-American	1.006	0.074
Race: American Indian	1.006	0.074
Race: Asian-American	1.008	0.091
Race: Chicano\Mexican-American	1.011	0.105
Race: Puerto-Rican American	1.006	0.074
Father's Educational Level	5.391	1.956
Mother's Educational Level	4.782	1.608
Socioeconomic Status	18.785	5.120
High School Rank	4.636	0.617
High School Grades	6.408	1.252
SAT Composite Score	1050.390	19.257
Degree Aspirations	2.011	0.751
Commitment to College Completion	7.582	0.862
Academic Major Choice/Career Choice		
Academic Major: Undecided	1.041	0.199
Career Choice: Undecided	1.083	0.276
Decided Major/Decided Career	1.912	0.284
Undecided Major/Undecided Career	1.036	0.186
Decided Major/Undecided Career	1.047	0.212
Undecided Major/Decided Career	1.006	0.074
Student Involvement Measures		
Enrollment: Full-time	1.928	0.258
Living Arrangements: On Campus	1.129	0.336
Enrolled in Honors Program	1.328	0.470
Held Part-time Job: On Campus	1.614	0.487
Held Part-time Job: Off Campus	1.722	0.449
Held Full-time Job	1.116	0.320
Student-Student Academic Involvement	5.300	0.905
Student-Student Social Involvement	3.695	1.127
Student Leadership/Political Involvement	3.325	1.052
Student-Faculty Interaction	3.963	0.814
College Grades	4.314	0.961
Persistence	1.595	0.492

NOTE: Institution D = Medium selective private university with a moderate range persistence rate.

Table D.5
Means and Standard Deviations for All Variables in the Regression Analysis for Institution E (N = 205)

Variable	*Mean*	*SD*
Precollege Student Characteristics		
Gender: Female	1.517	0.501
Race: White	1.902	0.297
Race: Black/Afro-American	1.044	0.205
Race: American Indian	1.000	0.000
Race: Asian-American	1.039	0.194
Race: Chicano\Mexican-American	1.000	0.000
Race: Puerto-Rican American	1.000	0.000
Father's Educational Level	6.966	1.542
Mother's Educational Level	6.312	1.537
Socioeconomic Status	23.185	4.688
High School Rank	4.785	0.536
High School Grades	6.659	1.107
SAT Composite Score	1276.044	120.497
Degree Aspirations	2.488	0.623
Commitment to College Completion	7.184	0.996
Academic Major Choice/Career Choice		
Academic Major: Undecided	1.229	0.421
Career Choice: Undecided	1.332	0.472
Decided Major/Decided Career	1.620	0.487
Undecided Major/Undecided Career	1.180	0.386
Decided Major/Undecided Career	1.151	0.359
Undecided Major/Decided Career	1.049	0.216
Student Involvement Measures		
Enrollment: Full-time	1.859	0.349
Living Arrangements: On Campus	1.620	0.487
Enrolled in Honors Program	1.800	0.401
Held Part-time Job: On Campus	1.776	0.418
Held Part-time Job: Off Campus	1.463	0.500
Held Full-time Job	1.020	0.139
Student-Student Academic Involvement	5.076	0.839
Student-Student Social Involvement	3.808	1.184
Student Leadership/Political Involvement	4.012	1.110
Student-Faculty Interaction	4.510	1.021
College Grades	4.737	0.699
Persistence	1.849	0.359

NOTE: Institution E = Very highly selective nonsectarian four-year college with a high range persistence rate.

Table D.6
Means and Standard Deviations for All Variables in the Regression Analysis for Institution F (N = 179)

Variable	*Mean*	*SD*
Precollege Student Characteristics		
Gender: Female	1.592	0.493
Race: White	1.827	0.379
Race: Black/Afro-American	1.078	0.269
Race: American Indian	1.006	0.075
Race: Asian-American	1.034	0.180
Race: Chicano\Mexican-American	1.045	0.207
Race: Puerto-Rican American	1.011	0.105
Father's Educational Level	4.206	2.015
Mother's Educational Level	3.881	1.636
Socioeconomic Status	14.871	4.753
High School Rank	4.565	0.660
High School Grades	5.894	1.478
SAT Composite Score	976.677	150.437
Degree Aspirations	1.907	0.709
Commitment to College Completion	7.776	0.758
Academic Major Choice/Career Choice		
Academic Major: Undecided	1.050	0.219
Career Choice: Undecided	1.073	0.260
Decided Major/Decided Career	1.911	0.286
Undecided Major/Undecided Career	1.034	0.180
Decided Major/Undecided Career	1.039	0.194
Undecided Major/Decided Career	1.017	0.129
Student Involvement Measures		
Enrollment: Full-time	1.883	0.307
Living Arrangements: On Campus	1.106	0.301
Enrolled in Honors Program	1.468	0.492
Held Part-time Job: On Campus	1.284	0.439
Held Part-time Job: Off Campus	1.881	0.322
Held Full-time Job	1.320	0.458
Student-Student Academic Involvement	5.011	0.953
Student-Student Social Involvement	3.208	1.170
Student Leadership/Political Involvement	3.041	1.070
Student-Faculty Interaction	3.726	0.818
College Grades	4.266	1.077
Persistence	1.715	0.453

NOTE: Institution F = Low selective private university with a high range persistence rate.

Table D.7
Predicting Student Persistence at Institution A:
The Impact of Being Undecided While Controlling for Other Variables Related to Persistence

	Variable				*Beta After Step*						
Step	*Name*	*R*	R^2	*r*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
	Precollege Student Characteristics										
1	Socioeconomic Status	17	03@	17**	17**	17**	17**	15**	15**	15**	14**
2	Commitment to College Completion	22	05@	13**	14**	14**	13**	13**	13**	14**	16**
3	Average High School Grades	24	06@	11**	12**	10*	10*	10*	10*	10*	05*
4	Race: White/Caucasian	26	07@	13**	10*	11*	10*	10*	10*	09*	08
5	Race: American Indian	27	08@	-09*	-09*	-09*	-09*	-09*	-09*	-09*	-08*
	Academic Major/Career Choice										
6	Career: Undecided	30	09@	13**	13**	14**	14**	13**	13**	13**	12**
	Student Involvement Measures										
7	Average College Grades	35	12@	21**	20**	21**	20**	19**	19**	18**	18**
	Variables Not in the Equation										
	Gender: Female			08	08	07	07	07	08	07	06
	Race: Black/Afro-American			-08	-07	-07	-06	-05	-03	-02	-02
	Race: Asian-American			-09*	-07	-08	-09*	-04	-04	-06	-07
	Race: Mexican-American/Chicano			-08	-04	-04	-02	00	01	01	02
	Race: Puerto Rican-American			-06	-07	-07	-07	-06	-05	-07	-07
	Father's Educational Level			11*	-03	-04	-05	-05	-05	-05	-06
	Mother's Educational Level			12*	-00	00	-01	-00	01	01	-01
	High School Rank			08	09*	09*	05	05	04	04	05

Table D.7 - continued

Step	Variable Name	R	R^2	r	Beta After Step 1	2	3	4	5	6	7
	Variables not in the Equation (cont.)										
	Degree Aspirations			06	04	02	01	01	02	03	01
	SAT Composite Score			00	-01	01	01	01	01	02	01
	Enrollment: Full-time			11*	11*	10*	09*	10*	10*	08	06
	Living Arrangements: On Campus			-02	-02	-03	-04	-04	-04	-03	-04
	Academic Major: Undecided			06	06	05	05	05	05	-01	-00
	Decided Major/Decided Career			-11*	-11*	-12**	-12**	-12**	-12**	02	01
	Undecided Major/Undecided Career			09*	08	08	08	08	08	00	00
	Decided Major/Undecided Career			10*	10*	11*	11*	10*	10*	-00	-00
	Undecided Major/Decided Career			-02	-02	-02	-02	-01	-02	-01	-00
	Enrolled in Honors Program			14**	13**	13**	11*	10*	10*	10*	03
	Part-time Job: On Campus			03	04	04	04	04	05	04	03
	Part-time Job: Off Campus			03	03	03	04	03	04	03	05
	Held Full-time Job			-12*	-11*	-10*	-09*	-10*	-09*	-08	-05
	Student-Student Academic Involvement			02	02	00	-01	-01	-01	-01	-04
	Student-Student Social Involvement			08	06	04	03	02	02	01	02
	Student Leadership/Political Involvement			06	04	02	01	01	01	01	-01
	Student-Faculty Interaction			00	-01	-01	-02	-02	-01	-01	-06

$N = 492$

*$p < .05$, **$p < .01$

@Change in R^2 significant at $p < .01$ when variable added to the regression equation.

#Change in R^2 significant at $p < .05$ when variable added to the regression equation.

Notes: Institution A = Highly selective public university with a low range persistence rate.
Decimals omitted from coefficients.

Table D.8
Predicting Student Persistence at Institution B:
The Impact of Being Undecided While Controlling for Other Variables Related to Persistence

	Variable				*Beta After Step*					
Step	*Name*	*R*	R^2	*r*	*1*	*2*	*3*	*4*	*5*	*6*
	Precollege Student Characteristics									
1	Race: White/Caucasian	23	05@	23**	23**	22**	22**	21**	18**	17**
2	Average High School Grades	28	08@	17**	15**	15**	15**	12	07	08
	Student Involvement Measures									
3	Enrollment: Full-time	39	15@	28**	28**	28**	28**	23**	21**	23**
4	Student-Faculty Interaction	44	19@	29**	28**	26**	20**	20**	17**	20**
5	Average College Grades	47	22@	31**	28**	25**	21**	18*	18*	15*
6	Student-Student Social Involvement	48	23@	-10	-07	-08	-13*	-16*	-14*	-14*
	Variables Not in the Equation									
	Gender: Female			14*	11	12	13*	13*	13*	13*
	Race: Black/Afro-American			-07	-03	00	-01	-04	-03	-01
	Race: American Indian			03	04	07	06	04	03	05
	Race: Asian-American			-14*	10	07	01	06	04	05
	Race: Mexican-American/Chicano			-08	-02	00	-00	-04	-04	-05
	Race: Puerto Rican-American			-05	-02	-01	03	01	01	00
	Father's Educational Level			02	-04	-03	-02	-00	-01	-03
	Mother's Educational Level			00	-08	-07	-08	-08	-09	-09
	Family Socioeconomic Status			07	-01	-00	-02	00	-01	-01
	High School Rank			07	05	-08	-04	-01	-02	-01

Table D.8 - continued

Step	Variable Name	R	R^2	r	Beta After Step 1	2	3	4	5	6
	Variables not in the Equation (cont.)									
	Degree Aspirations			-09	-10	-11	-10	-14*	-16*	-15*
	SAT Composite Score			-01	-02	-01	-02	-05	-05	-05
	Commitment to College Completion			03	04	04	-03	-04	-03	-03
	Living Arrangements: On Campus			05	10	09	04	04	05	07
	Academic Major: Undecided			-08	-08	-06	-05	-04	-05	-05
	Career: Undecided			00	-01	02	03	04	03	03
	Decided Major/Decided Career			01	02	-01	-02	-03	-02	-01
	Undecided Major/Undecided Career			-08	-08	-05	-04	-02	-03	-03
	Decided Major/Undecided Career			07	05	07	06	07	07	06
	Undecided Major/Decided Career			-03	-03	-03	-02	-04	-04	-04
	Enrolled in Honors Program			07	04	04	01	-02	-06	-04
	Part-time Job: On Campus			19**	19**	18**	13**	10	08	08
	Part-time Job: Off Campus			-05	-09	-08	-01	-02	-01	-01
	Student-Student Academic Involvement			12	10	08	02	-05	-04	03
	Student-Student Political Involvement			-10	-08	-08	-07	-11	-11	-10

$N = 206$

$*p < .05$, $**p < .01$

@Change in R^2 significant at $p < .01$ when variable added to the regression equation.

#Change in R^2 significant at $p < .05$ when variable added to the regression equation.

Notes: Institution B = Medium selective public four-year college with a low range persistence rate.
Decimals omitted from coefficients.

Table D.9
Predicting Student Persistence at Institution C:
The Impact of Being Undecided While Controlling for Other Variables Related to Persistence

	Variable				*Beta After Step*					
Step	*Name*	*R*	R^2	*r*	*1*	*2*	*3*	*4*	*5*	*6*
	Precollege Student Characteristics									
1	Average High School Grades	17	03@	17**	15**	15**	15**	14**	13**	13**
2	Gender: Female	22	05@	17**	15**	15**	15**	14**	13**	13**
	Academic Major/Career Choice									
3	Academic Major: Undecided	24	06@	-09*	-09*	-10*	-10*	-11**	-11**	-11**
	Student Involvement Measures									
4	Enrollment: Full-time	38	14@	31**	29**	29**	30**	30**	26**	21**
5	Average College Grades	43	18@	29**	27**	26**	26**	21**	21**	21**
6	Held Full-time Job	46	21@	-25**	-25**	-25**	-25**	-17**	-17**	-17**
	Variables Not in the Equation									
	Race: White/Caucasian			02	02	02	02	01	01	01
	Race: Black/Afro-American			-09*	-07	-06	-07	-04	-04	-04
	Race: American Indian			02	03	02	01	-00	-00	01
	Race: Asian-American			06	07	06	06	05	04	05
	Race: Mexican-American/Chicano			-07	-06	-06	-06	-06	-06	-06
	Race: Puerto Rican-American			-04	-06	-07	-07	-07	-05	-06
	Father's Educational Level			03	02	01	02	01	-00	-00
	Mother's Educational Level			02	02	01	00	-01	-02	-01

Table D.9 - continued

Step	Variable Name	R	R^2	r	Beta After Step 1	2	3	4	5	6
	Variables not in the Equation (cont.)									
	Family Socioeconomic Status			09*	08	08	07	06	04	04
	High School Rank			13**	04	05	05	03	02	00
	Degree Aspirations			-03	-04	-04	-04	-01	-02	-01
	SAT Composite Score			-02	-04	-03	-03	-02	-04	-03
	Commitment to College Completion			09*	08	07	06	06	07	07
	Living Arrangements: On Campus			02	-00	-00	-00	-04	-04	-05
	Career: Undecided			02	03	02	07	05	07	06
	Decided Major/Decided Career			00	-01	00	-07	-06	-06	-06
	Undecided Major/Undecided Career			-07	-06	-06	05	03	06	06
	Decided Major/Undecided Career			07	07	06	06	05	05	05
	Undecided Major/Decided Career			-07	-07	-08	-04	-02	-04	-04
	Enrolled in Honors Program			08	05	05	05	05	00	01
	Part-time Job: On Campus			03	03	02	02	03	04	03
	Part-time Job: Off Campus			-11*	-10*	-11**	-11**	-11**	-10*	-07
	Student-Student Academic Involvement			17**	15**	15**	15**	12**	08*	07
	Student-Student Social Involvement			06	05	06	06	05	05	03
	Student Leadership/Political Involvement			02	01	01	01	00	-01	-02
	Student-Faculty Interaction			08	07	06	05	06	01	-00

$N = 541$

$*p < .05$, $**p < .01$

@Change in R^2 significant at $p < .01$ when variable added to the regression equation.

#Change in R^2 significant at $p < .05$ when variable added to the regression equation.

Notes: Institution C = Low selective private university with a moderate range persistence rate. Decimals omitted from coefficients.

Table D.10
Predicting Student Persistence at Institution D:
The Impact of Being Undecided While Controlling for Other Variables Related to Persistence

	Variable				*Beta After Step*							
Step	*Name*	*R*	R^2	*r*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
	Precollege Student Characteristics											
1	Gender: Female	20	04@	20**	20**	20**	20**	20**	22**	20**	20**	20**
2	Race: Asian-American	23	05@	-11*	-11*	-11*	-12*	-10*	-10*	-10*	-11*	-12*
3	Commitment to College Completion	26	07@	12*	11*	11*	11*	11*	11*	11*	11*	11*
	Student Involvement Measures											
4	Enrollment: Full-time	30	09@	17**	17**	16**	16**	16**	16**	15**	14**	12*
5	Part-time Job: Off Campus	33	11@	-11*	-15**	-14**	-14**	-15**	-15**	-14**	-12*	-12*
6	Average College Grades	36	13@	18**	15**	15**	15**	14**	13**	13*	13*	13**
7	Held Full-time Job	38	14@	-14**	-15**	-15**	-15**	-14**	-12*	-12*	-12*	-13*
8	Student-Faculty Interaction	39	16@	13**	13**	15**	14**	13**	12*	12*	12*	12*
	Variables Not in the Equation											
	Race: White/Caucasian			11*	09	05	05	06	06	05	05	04
	Race: Black/Afro-American			-09	-07	-07	-08	-08	-07	-06	-05	-05
	Race: American Indian			-01	-03	-03	-03	-03	-02	-01	-02	-02
	Race: Mexican-American/Chicano			-07	-06	-06	-06	-07	-06	-06	-07	-06
	Race: Puerto Rican-American			06	06	06	07	06	07	07	07	07
	Father's Educational Level			-02	-01	00	-00	01	-00	00	-00	-01
	Mother's Educational Level			00	-00	02	00	00	-00	-01	-01	-02
	Family Socioeconomic Status			04	05	07	06	07	06	06	06	05

Table D.10 - continued

Step	Variable Name	R	R^2	r	Beta After Step 1	2	3	4	5	6	7	8
	Variables not in the Equation (cont.)											
	High School Rank			-04	-06	-05	-05	-06	-06	-06	-11*	-10*
	Average High School Grades			05	01	01	01	-00	-00	-10	-09	-09
	Degree Aspirations			03	02	01	01	01	01	00	02	00
	SAT Composite Score			01	01	01	01	01	02	01	01	01
	Living Arrangements: On Campus			03	05	07	06	06	04	04	03	03
	Academic Major: Undecided			00	-01	-02	-01	-01	-03	-02	-03	-02
	Career: Undecided			06	04	04	04	04	03	04	03	03
	Decided Major/Decided Career			-06	-04	-03	-04	-03	-02	-03	-02	-02
	Undecided Major/Undecided Career			01	-01	-01	-01	-01	-02	-01	-02	-02
	Decided Major/Undecided Career			08	06	06	06	05	05	06	05	05
	Undecided Major/Decided Career			-01	-01	-01	-01	-02	-02	-02	-03	-02
	Enrolled in Honors Program			00	-00	-00	-01	-01	-00	-03	-02	-04
	Part-time Job: On Campus			04	02	02	02	02	02	01	01	01
	Student-Student Academic Involvement			12*	13**	14**	13**	12*	11*	09	09	05
	Student-Student Social Involvement			11*	13**	13*	12*	11*	10	09	09	06
	Student Leadership/Political Involvement			13**	12*	12*	11*	10	10	08	09	06

$N = 363$

$*p < .05$, $**p < .01$

@Change in R^2 significant at $p < .01$ when variable added to the regression equation.

#Change in R^2 significant at $p < .05$ when variable added to the regression equation.

Notes: Institution D = Medium selective private university with a moderate range persistence rate.
Decimals omitted from coefficients.

Table D.11
Predicting Student Persistence at Institution E:
The Impact of Being Undecided While Controlling for Other Variables Related to Persistence

	Variable				*Beta After Step*			
Step	*Name*	*R*	R^2	*r*	*1*	*2*	*3*	*4*
	Student Involvement Measures							
1	Enrollment: Full-time	61	37@	61**	61**	60**	58**	57**
2	Held Full-time Job	64	41@	-24**	-21**	-21**	-19**	-20**
3	Part-time Job: Off Campus	66	43@	-26**	-17**	-14**	-15**	-14**
4	Student-Faculty Interaction	67	45@	14**	09	11*	11*	11*
	Variables Not in the Equation							
	Gender: Female			-05	03	02	03	03
	Race: White/Caucasian			-05	01	01	01	01
	Race: Black/Afro-American			02	-03	-03	-03	-02
	Race: American Indian			--	--	--	--	--
	Race: Asian-American			09	04	03	03	03
	Race: Mexican-American/Chicano			--	--	--	--	--
	Race: Puerto Rican-American			--	--	--	--	--
	Father's Educational Level			-01	-02	-02	-03	-03
	Mother's Educational Level			02	-03	-02	-03	-03
	Family Socioeconomic Status			-01	-03	-03	-04	-04
	High School Rank			11*	05	04	04	03
	Average High School Grades			12*	05	05	04	03
	Degree Aspirations			00	00	03	02	00
	SAT Composite Score			07	09	08	07	07
	Commitment to College Completion			06	06	07	06	06
	Living Arrangements: On Campus			26**	11	09	07	07

Table D.11 - continued

Step	Variable Name	R	R^2	r	Beta After Step 1	2	3	4
	Variables not in the Equation (cont.)							
	Academic Major: Undecided			-03	-00	-02	-02	-01
	Career: Undecided			04	01	-01	-01	-01
	Decided Major/Decided Career			-02	01	04	03	02
	Undecided Major/Undecided Career			-01	02	01	01	01
	Decided Major/Undecided Career			06	-02	-03	-02	-02
	Undecided Major/Decided Career			-03	-05	-05	-04	-04
	Enrolled in Honors Program			-01	03	05	05	02
	Part-time Job: On Campus			10	03	03	03	01
	Student-Student Academic Involvement			02	03	01	00	-03
	Student-Student Social Involvement			08	-01	-02	-03	-03
	Student-Leadership/Political Involvement			14**	-01	-02	-02	-04
	Average College Grades			04	04	04	04	02

$N = 205$

$*p < .05$, $**p < .01$

@Change in R^2 significant at $p < .01$ when variable added to the regression equation.

#Change in R^2 significant at $p < .05$ when variable added to the regression equation.

Notes: Institution E = Very highly selective nonsectarian four-year college with a high range persistence rate.
Decimals omitted from coefficients.

Table D.12
Predicting Student Persistence at Institution F:
The Impact of Being Undecided While Controlling for Other Variables Related to Persistence

Step	*Variable Name*	*R*	R^2	*r*	*Beta After Step 1*	*2*	*3*
	Precollege Student Characteristics						
1	Commitment to College Completion	17	03#	17*	17*	17*	10
2	Average High School Grades	22	05#	15*	15*	15*	14*
	Student Involvement Measures						
3	Enrollment: Full-time	43	18@	39**	37**	37**	37*
	Variables Not in the Equation						
	Gender: Female			06	04	00	02
	Race: White/Caucasian			01	00	-01	01
	Race: Black/Afro-American			-00	01	03	01
	Race: American Indian			-12	-10	-09	-02
	Race: Asian-American			-02	-01	-01	-01
	Race: Mexican-American/Chicano			02	00	-00	-03
	Race: Puerto Rican-American			-05	-04	-04	01
	Father's Educational Level			03	02	02	05
	Mother's Educational Level			-07	-07	-04	-05
	Family Socioeconomic Status			-02	-03	-01	03
	High School Rank			01	01	-14	-11
	Degree Aspirations			01	-02	-04	-01
	SAT Composite Score			01	00	-06	-01

Table D.12 - continued

Step	Variable Name	R	R^2	r	Beta After Step 1	2	3
	Variables not in the Equation (cont.)						
	Living Arrangements: On Campus			04	02	02	01
	Academic Major: Undecided			-08	-07	-08	-08
	Career: Undecided			-11	-08	-09	-11
	Decided Major/Decided Career			11	08	09	12
	Undecided Major/Undecided Career			-09	-07	-08	-08
	Decided Major/Undecided Career			-06	-04	-05	-07
	Undecided Major/Decided Career			-01	-01	-02	-04
	Enrolled in Honors Program			08	08	04	05
	Part-time Job: On Campus			10	08	07	03
	Part-time Job: Off Campus			08	10	09	08
	Held Full-time Job			01	01	03	05
	Student-Student Academic Involvement			20**	18*	17*	12
	Student-Student Social Involvement			-01	-02	-03	-05
	Student Leadership/Political Involvement			-06	-07	-08	-08
	Student-Faculty Interaction			06	05	05	-01
	Average College Grades			21**	21**	18*	11

$N = 179$

*$p < .05$, **$p < .01$

@Change in R^2 significant at $p < .01$ when variable added to the regression equation.

#Change in R^2 significant at $p < .05$ when variable added to the regression equation.

Notes: Institution F = Low selective private university with a high range persistence rate.
Decimals omitted from coefficients.