STUDENT AID AND PERSISTENCE
IN PUBLIC COMMUNITY COLLEGES

by

Cheryl Chesney Chambless

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APPROVED:

S. Kern Alexander, Chairman

M. David Alexander  James D. McComas

Lawrence H. Cross  Richard G. Salmon

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Committee Chairman: S. Kern Alexander
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(ABSTRACT)

The purpose of this study was to test a conceptual model for assessing the effects of student aid on community college student persistence. A sample consisting of all students who had entered a public community college during the 1980 fall term was drawn from the database of High School and Beyond, 1980 Senior Cohort. Omitting transfer students brought the sample size to 1,364 students. The model of student persistence was based on Tinto's theory of student integration and prior research that suggested student aid may be related to the persistence of community college students. Persistence was defined as the number of terms of enrollment over a two year period (1980-81 and 1981-82).

Receipt of aid was associated with lower socioeconomic status, higher tuition charges, above average high school grades, and an ethnic background other than Asian or non-Hispanic white. Aid recipients considered college costs and the availability of aid more important factors in their college choice.

A model of student persistence composed of eight exogenous and five endogenous variables was tested through path analysis. It was found that the receipt of student aid did not have significant effects on any of the subsequent variables in the model. Estimation of a reduced path model omitting the aid variable did not result in a significant reduction in explained variance.
Degree goals, initial expectation regarding higher education, encouragement to attend college, academic integration, and full-time work were the most important influences on persistence. These findings validated the importance of some of the major constructs in the theory of student integration, but they did not support the research hypothesis that student aid recipients would have a higher rate of persistence than nonrecipients when other factors were held constant. Since encouragement from significant others had a strong and positive association with student persistence, it was suggested that future research consider the role of encouragement on persistence.
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CHAPTER ONE
INTRODUCTION

Student financial aid has become an increasingly important concern for institutions, students and policy makers. In 1988-89, $26.7 billion was spent by federal, state and institutional sources for student aid with 75 percent of the funding generated by federal support (Lewis, 1989). As the costs of aid have risen, public expectations for returns on the investment have risen, concomitantly. Equal opportunity is an expressed goal of student aid but there is a lack of evidence that student aid is an effective mechanism for promoting equal opportunity (St. John, 1991).

Most of the research seems to have been conducted to determine whether student aid, both need and merit based, are productive methods for influencing students to pursue higher education and to choose particular institutions (i.e. Leslie & Brinkman, 1988; Manski & Wise, 1983; McPherson & Schapiro, 1991). From a review of recent research, St. John (1991) concluded that student aid is effective in promoting equal educational opportunity. Generally there is consensus that student aid can and does influence student enrollment. Manski and Wise concluded that the Basic Educational Opportunity Grant (BEOG) Program, now called Pell Grant, was responsible for a 59 percent increase in the enrollment rate of low-income students in 1979 over the predicted enrollment of low-income students if the program had not existed.

According to Porter (1991), there are three equally important goals associated with equal educational opportunity: access to college, a chance to exercise choice among colleges, and the opportunity to persist in higher education to the completion of one's goals. In assessing the
effects of student aid on persistence, most research compares the behavior of aid recipients with that of nonrecipients, without reference to income, to determine whether student aid has removed the financial barriers for recipients. Until recently most persistence research was conducted by institutions, while the most recent national research has focused on four year colleges (Porter, 1990) or has examined persistence across segments of higher education (St. John, Kirshstein, & Noell, 1991). This study focused on the effects of student aid on public community college students, a segment which has been largely ignored in research regarding the effects of student aid.

Need for the Study

The quality of educational institutions is judged in a number of ways. Increasingly, institutions are judged on the basis of outcomes, including persistence rates (Astin, 1985). One of the main criticisms of community colleges is their high attrition rates (Astin; Broneman & Nelson, 1981). Astin noted the high attrition rates of community colleges was used as an argument for increasing the access to four-year institutions for minority students; however, Breneman and Nelson concluded that black students had a better chance of receiving a bachelor's degree if they initially entered a two-year college rather than a four-year college. During the 1970's and 1980's community colleges awarded degrees and certificates to only about nine percent of their students each year (Cohen & Brawer, 1989). There are several possible explanations for these rates: open admission policies, the part-time and non-traditional nature of their student bodies, the lack of residence halls, and the number of students who have jobs off campus. Cohen and Brawer concluded their overview of persistence research by saying that "few of the reasons that students give for leaving are amenable to amelioration by the college" (p. 57).

While the individual college may not be able to alleviate the economic press which may contribute to a student's dropping out, that is one of the goals of student aid. If one accepts the premise that student aid has increased the access of low-income students to higher education, the
next logical question is whether those afforded access through student aid have been able to persist in the system of higher education.

Student aid may have a greater effect on the persistence of community college students than on college students in general; however, there is a lack of empirical research which focuses on community college students (Leslie & Brinkman, 1988; Murdock, 1987). Given that low-income freshmen and disadvantaged minority groups are disproportionately represented in community colleges (Astin, 1985) and that these are the target populations for much of the available student aid, it is essential that the relationship between student aid and persistence of community college students be analyzed. For this study, the problem is to analyze the relationship between student aid and persistence of community college students.

This study contributes to the understanding of the role of student aid in persistence among community college students. If student aid does contribute to persistence, the finding that community college students are the least likely to receive aid is particularly alarming (Breneman & Nelson, 1981; Grubb & Tuma, 1991). In 1986 only about one-third of the community college students in a national sample applied for aid compared to more than 50 percent of the students attending four-year, vocational-technical, or proprietary institutions. The percentage of applicants who were denied aid was highest for community college applicants. Even after controlling for various measures of student need and tuition, community college students were disproportionately under-represented among aid recipients (Grubb & Tuma).

There are those who argue for higher tuition and increased student aid (McPherson & Schapiro, 1991). Their argument is that the additional revenue generated from tuition could be used to increase the amount of aid available to low-income students. However, there is uncertainty about the effects of tuition increases on persistence. Some have concluded that community college students are more sensitive to tuition changes than are other students (Grubb, 1988; Leslie & Brinkman, 1988; Murdock, 1987). Recently St. John (1990) concluded that
students' persistence decisions in the 1980's were more responsive to student aid than to the amount of tuition charged. However, differences in tuition levels and student populations between two- and four-year institutions make it difficult to assume that findings from general studies apply equally to community colleges (Breneman & Nelson, 1981).

While student persistence has been the most frequently studied topic in the community college research literature (Cohen & Brawer, 1989), Leslie and Brinkman (1988) found few studies of the effects of student aid on persistence of two-year college students; and those few which had included student aid were poorly controlled. The failure to consider student aid and student's financial condition has been cited as a weakness in the approach to studying attrition (Dresch, 1975; Tinto, 1982). Tinto noted that "aggregate models of dropout tend to underestimate and even distort the character of dropout among various groups of students, especially those from disadvantaged backgrounds" (p. 691) and that further study of attrition among two-year colleges was needed.

It seems unlikely that student persistence and student aid will become less critical issues in the near future. "Support of and confidence in higher education will inevitably decline unless the need to change enrollment patterns by reducing attrition is not met head on" (Barr, Upcraft & Associates, 1990, p. 10). Public community colleges accounted for 42 percent of all undergraduates enrolled in 1990, and 22.5 percent of the enrollment in public community colleges were minority students (The Chronicle of Higher Education Almanac, 1992). Given the expressed goals of student aid, it is imperative that the effects of student aid on community college persistence be examined.
Purpose of the Study

The primary purpose of this study was to test a conceptual model for assessing the effects of student aid on community college student persistence. In addition, the following ancillary purposes were addressed:

1. Synthesize extant literature.
2. Determine the characteristics of student aid recipients.
3. Compare the characteristics of student aid recipients with those of students who did not receive aid.
4. Relate students’ pre-entry attributes with their persistence.
5. Relate students’ collegiate experiences with their persistence.

Conceptual Framework

According to Leslie and Brinkman (1988), three approaches which have been used to measure the impact of student aid are:

1. econometric analysis of student behavior;
2. surveys soliciting opinions on the impact of aid; and
3. calculations of higher education participation rates.

This study utilized the econometric approach which Leslie and Brinkman considered the preferred method as it allowed the best opportunity to control systematically the influence of other factors that may distort the true relationship between student aid and persistence.

The study was guided by a model proposed by St. John et al. (1991) for assessing the effects of student aid on persistence which was grounded in the educational attainment and student integration research. Their model which was designed specifically for the analysis of national student databases was used to examine the effects of aid on a national sample of college students; but St. John et al. suggested that the model could be refined through separate analysis of students
attending two-year institutions. The use of a theory-based model overcame a deficiency which Bean and Metzner (1985) observed in a review of persistence research. They noted that research was needed at two year commuter institutions that:

   a. was based on a theory;

   b. included factors from students' external environments; and

   c. used multivariate research designs.

The explicit goals and forms of student aid provided the framework within which its effects were judged. Underlying the goals of student aid is the belief that both the award of aid and the amount offered should be based on the recipient's demonstrated need (Huff, 1989). The extent to which student persistence was influenced by economic factors was the focus of the study.

**Research Questions**

The purpose of this study was addressed by seeking answers to the following questions:

1. What are the literature-based findings related to the persistence of community college students?

2. What are the characteristics of student aid recipients?

3. How do student aid recipients differ from students who do not receive aid?
   a. Are there differences in the students' pre-entry attributes?
   b. Are there differences in the students' degree goals?
   c. Are there differences in the students' collegiate experiences?

4. What is the relationship between students' pre-entry attributes and persistence?
   a. What is the relationship between gender and persistence?
   b. What is the relationship between race and persistence?
   c. What is the relationship between socioeconomic status and persistence?
   d. What is the relationship between high school grades and persistence?
e. What is the relationship between encouragement to attend college and persistence?

f. What is the relationship between degree goals and persistence?

5. What is the relationship between students’ collegiate experiences and persistence?
   a. What is the relationship between receipt of student aid and persistence?
   b. What is the relationship between college grades and persistence?
   c. What is the relationship between academic integration into the collegiate environment and persistence?

6. Does the receipt of student aid enhance persistence?

**Research Hypotheses**

The following null hypotheses were tested:

1. There is no significant difference in the pre-entry attributes of student aid recipients and students who did not receive aid.

2. There is no relationship between pre-entry attributes of students and their persistence.

3. There is no relationship between collegiate experiences of students and their persistence.

4. There is no significant difference in the persistence rate of student aid recipients and students who do not receive aid when other factors listed above are held constant.

**Assumptions**

The following assumptions provided a starting point for this study:

1. Self-reported college grades are an appropriate indication of students’ collegiate performance. Cabrera, Stampen, and Hansen (1990) reported a high level of agreement between student and institutional reports of college grades, a correlation of .75, based upon a representative sample of public college students.
2. Student's satisfaction with facets of the academic environment are a reasonable indication of the student's integration into the academic environment.

3. Tuition charged by a particular community college reflects the local economy and represents the least expensive alternative among colleges in the geographic area.

Delimitations

1. The study was delimited to a sample of students who were participants in the national longitudinal study, High School and Beyond, 1980 Senior Cohort (henceforth HSB).

2. Only those students who enrolled in community colleges during the fall semester following high school graduation and did not transfer to a different college were included; thus, this study did not address older students who entered community colleges, students who transferred to community colleges after initial entry into a four year college, nor students who transferred from community colleges within the first two years.

3. The study was delimited to the relationship between student aid and persistence for those students who enrolled in a community college following high school graduation; thus, the role of student aid in providing access to higher education was beyond the scope of the study.

4. The study was delimited to student aid as a whole and did not analyze differences among types of aid.

5. The study did not include the student integration theory constructs of social integration and institutional commitment because there was limited research support for these constructs in studies of community college student persistence.
Limitations

The use of a national longitudinal database increased the generalizability of findings; however, sample design, measures of the variables, and item response rates were limitations resulting from the use of an extant database. The survey sample for HSB was designed to facilitate research on selected sub-groups of students by over-sampling high schools with high minority populations, alternative public schools and private schools with high achieving students. As a result the sample for this study reflected an over-representation of minority students, specifically black and Hispanic students.

Operational definitions of the variables were limited to the existing data and were approximations of the theoretical constructs. This study was limited to the extent that measures of the variables were valid representations of the complex, psychological constructs of the theoretical model. Another limitation involved the use of survey data. As with any survey, there was the possibility of bias resulting from missing data, differences in interpreting questions, failure to give correct information and errors in recording and coding data.

Because the subjects for the study entered community colleges in 1980, the results must be cautiously generalized to traditional community college students who enrolled after 1980. The results may not be generalized beyond community college students who achieved access to higher education.

The study was limited to generalization about the effects of student aid as awarded in the early 1980’s. Changes in student aid criteria and the packaging of aid which have occurred since the early 1980’s limit the generalizability of findings.

Definitions

The following terms were used throughout the study. Definitions are provided to facilitate readability and understanding.
1. **Persistence** was defined as the number of terms of continued enrollment in the community college.

2. **Student aid** was defined as financial support provided for the student via a grant, scholarship, fellowship, benefit or loan by a governmental, institutional or private source other than the student. Student aid included Pell Grant; Supplemental Educational Opportunity Grant; Social Security Benefits for Children of Retired, Disabled or Deceased Parents; Veterans Administration Survivors' and Dependents Educational Assistance Program; Vocational Rehabilitation Educational Benefits; ROTC Scholarship; State Scholarship Program; college scholarship; private organization scholarship; National Direct Student Loan; Federal Guaranteed Student Loan; regular bank loans; and other aid programs. Specific survey questions listing all forms of student aid are included in Appendix A.

3. **Pre-entry attributes** were those characteristics which the student brought to the college environment and included gender, ethnicity, socioeconomic status, size of hometown, encouragement to attend college, study habits, high school grades, and collegiate expectations.

4. **Collegiate experiences** included student aid, academic performance, and integration into the academic environment. These selected experiences occurred following the student's initial enrollment and may have affected persistence.

**Organization of the Study**

The study is presented in five chapters. The following represents a summary of each chapter.
Chapter one includes the need for the study. The study is defined in terms of the purpose, conceptual framework, research questions, hypotheses, assumptions, delimitations, limitations and definitions.

A review of the literature constitutes chapter two. Tinto's (1987) explanatory, causal model of departure from college is outlined in chapter two, and research based on Tinto's model is presented. A brief synopsis of the history and purposes of student aid is provided. The remainder of the chapter is devoted to a review of research regarding the characteristics of student aid recipients and effects of student aid on persistence.

The research model and methodology are presented in the third chapter. The chapter includes descriptions of the database and the sample for this study. Operational definitions of the variables are presented, also.

Chapter four consists of the results of the study through analysis of the data. The findings are presented in relation to the research questions and to relevant literature from chapter two.

The findings are summarized and interpreted in chapter five. Conclusions, implications and recommendations resulting from the study are introduced.
CHAPTER TWO

REVIEW OF LITERATURE

A synthesis of research related to the present study is presented in this chapter in five sections. In the first section the theory of student integration which serves as the theoretical foundation for the study is summarized.

The second section includes a review of research based on Tinto's (1975, 1982, 1987) longitudinal model of the process of student departure. The longitudinal process is characterized by four stages culminating in students' decisions to depart from or persist in institutions of higher education. Beginning with the stage closest to the ultimate outcome of persistence or attrition, the second section consists of research findings related to the four stages: subsequent goal and institutional commitments; academic and social integration and college grades; initial goals and commitments; and background characteristics.

The history and purposes of student aid are addressed in the third section. It is organized according to the three major sources of student aid: institutions, states, and the federal government.

In the fourth section, research regarding the characteristics of student aid recipients is summarized. The focus is on student and institutional characteristics which have been associated with the receipt of student aid.

The fifth section is a synopsis of research regarding the relationship between student aid and persistence. Comparisons among student aid recipients and between student aid recipients and
nonrecipients are included. Section five concludes with examinations of the relationship between student employment and persistence.

**Student Integration Theory**

Tinto (1975, 1982, 1987) developed a longitudinal model of institutional departure to explore the relationships among students' characteristics, their collegiate experiences, and their decisions to persist in or depart from institutions of higher education. Major constructs of Tinto's theory, academic and social integration, revolve around the degree to which students become a part of the institution; therefore, it is called student integration theory. Attrition or student departure is seen as the culmination of a longitudinal process, beginning before the student enters an institution and affected by the collegiate environment. Tinto (1982) described the focus of his model as "the impact the institution itself has, in both its formal and informal manifestations, upon the dropout behaviors of its own students . . . . By inference it posed the policy question of how institutions can change themselves to reduce that attrition" (p. 688). Figure 1 represents Tinto's conceptual model.

**Background Characteristics**

The process begins with the development and identification of personal and academic attributes for each individual student. These attributes are called background characteristics and represent the first stage of the longitudinal process. Background characteristics are composed of innate qualities (e.g. gender, race, ability); familial influences (e.g. social status, expectational climate); and educational experiences (e.g. curriculum, grades).

**Initial Goals and Commitments**

The second stage occurs also before the student enters college and is referred to as initial intentions and commitments. According to student integration theory, a student's initial intentions and commitments toward higher education are shaped by the student's background
Figure 1. Tinto's Model for Departure from College

characteristics. Since intentions and commitments may change over time, Tinto’s model included two measures of intentions and commitments with the first being called initial intentions and commitments. Intentions reflect the person’s assessment of the likelihood of attaining specific goals while commitments embodies not only the level of one’s goal but the degree to which one is motivated to expend the energy and resources necessary to achieve it. Other things being equal, Tinto’s model predicts that individuals with higher educational intentions and commitments would be more persistent than those with lesser intentions and/or commitments.

**Academic and Social Integration**

Upon entering college, students enter the third stage of the longitudinal process in which interactions with faculty, staff, and student peers influence their decisions regarding higher education. It is at this third stage that Tinto postulates that academic and social integration occur. Integration results from the students’ background characteristics, initial intentions and commitments, and the collegiate environment over which the institution has some control.

Academic integration represents congruence between the student’s background and goals and his/her academic experiences in the college. The academic system of an institution involves the faculty and staff and is centered in classroom experiences. An academic climate that is too difficult given the student’s skills and interests may result in student departure via voluntary or involuntary withdrawal. Tinto noted that a decrease in the student’s performance may lead students of varying ability levels to withdraw prior to academic failure. Poor academic integration occurs as often when the academic environment fails to be challenging enough given the student’s skills and interests.

The extent to which a student becomes integrated into the social system of a college depends upon formal events, such as extra-curricular activities, and informal interactions between students and faculty, staff, and student peers. Withdrawal may occur when the student perceives substantial
differences between himself/herself and the social norms of the institution. While either academic or social malintegration may lead to students’ departure, particularly positive experiences in either realm may have compensatory effects. Nonresidential campuses generally have weak social systems to which Tinto attributes differences in rates of departure among different types of institutions. The importance of the academic system may be even greater for institutions lacking a cohesive social environment.

**External Commitments**

Students attending nonresidential campuses also may have greater difficulty balancing their roles as students with their roles in external communities. Families, work environments, and peer groups may have conflicting expectations, forcing students to choose between the collegiate community and external communities. Recognizing the potentiality for conflict between external commitments and collegiate integration, Tinto (1987) added external commitments as a factor which may be associated with altered commitments to higher education.

**Subsequent Goal and Institutional Commitments**

Theoretically, integration and external commitments result in students’ reassessment of their educational goals and commitments. This reassessment, which occurs after some collegiate experience, is referred to as subsequent goal and institutional commitments and represents the fourth stage of the longitudinal process. Reassessment may occur within the first few weeks of enrollment or over the course of years. The degree to which an individual is integrated into, or becomes a full member of, the academic and social systems of the college is paramount in determining whether students’ subsequent goal and institutional commitments are increased, decreased, or unchanged. Tinto’s model predicts that, other things being equal, the stronger the extent of integration the greater will be one’s ensuing goal and institutional commitments.

Tinto’s theory was based on persistence research by Spady (1970), with applications from Durkeim’s (1897/1951) explanation of the role of culture in societal suicide and Van Gennep’s
(1999/1960) study of the rites of passage in tribal societies. Durkeim sought to demonstrate how differences in the social and normative attributes of a society could account for differences in suicide rates among countries. Societies with high rates of suicide were characterized by social conditions which provided limited opportunities for personal affiliations and a lack of commonly held values.

Van Gennep (1909/1960) was concerned with the three distinct phases which an individual goes through in moving from being a youth to adulthood and the ceremonies which mark each stage. Tinto applied Van Gennep's stages of separation, transition, and incorporation to the process of a student disassociating from communities of the past to become a member of the collegiate community. Tinto observed that the process of separation from the past may be more difficult for students who live at home and commute to college. Other students who may have difficulty with the separation and transition stages include those from rural communities, from economically deprived backgrounds, or from families with no collegiate experience. The distress some encounter during these first two stages contribute to higher withdrawal rates during the first year of college.

**Research Based on Tinto's Model**

While there are several models of the process of student departure (Bean, 1980; Bean & Metzner, 1985; Lenning, Beal, & Sauer, 1980; St. John et al., 1991; Webb, 1989), Tinto's model is the most widely cited. Much of the empirical evidence regarding Tinto's model is based on four-year, residential student populations where findings are generally supportive of the model's premises (Anderson, 1987; Cabrera, Castaneda, Nora, & Hengstler, 1992; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1983; Terenzini, Pascarella, Theophilides, & Lorang, 1985). However, in studies including nonresidential campuses, some results have been incompatible with theoretical expectations regarding the structural patterns among background characteristics, initial
intentions/commitments, academic integration, social integration, external commitments, and subsequent goals/commitments.

In a study of freshmen from 11 residential and commuter institutions, Pascarella and Chapman (1983) found support for many of the associations between persistence and Tinto's theoretical concepts. However, when the data were analyzed separately by type of institution, differences in the patterns of influence emerged. Institutional commitment had a much stronger direct effect on persistence than goal commitment for students in the four-year residential and four-year commuter institutions; however, goal commitment was a more important factor among two-year college students. While social integration had both direct and indirect effects on persistence for the residential sample, it was not a significant factor for either the four- or two-year commuter institutions. Background characteristics were relatively unimportant for residential students but had stronger effects for the two samples of commuter students.

Nonresidential institutions are characterized by academic and social systems which are often highly segregated and/or unequal in size (Tinto, 1987); thus, differences in the relative importance of these constructs may be expected at different types of institutions. A review of research conducted at community colleges and commuter colleges was of primary interest in seeking to explicate the relationships among Tinto's concepts. Studies which have addressed the role of external commitments have centered on student employment, sometimes in the context of student aid; therefore, research related to external commitments is presented in the last section of this chapter.

**Subsequent Goal and Institutional Commitments**

Subsequent goal and institutional commitments represent the reassessment by students of their initial goals and commitments after having some experience in the collegiate environment. This construct has two facets: goal commitment is associated with the degree of integration into
the academic milieu of the institution while institutional commitment is associated with social integration.

**Goal commitment and persistence.**

Theoretically a student who becomes highly integrated through academic interactions would be expected to have stronger commitments to educational goals and would be more likely to persist as a result. Conversely, the student who is academically isolated or who perceives a poor academic fit between himself/herself and the institution would be expected to exhibit diminished goal commitment. In studies of community college students, subsequent goal commitment has been determined to have a significant association with persistence (Anderson, 1987; Bers & Smith, 1991; Grosset, 1991; Nora, 1987; Pascarella & Chapman, 1983). Munro (1981) found that subsequent goal commitment had the strongest effect among the variables studied on persistence for a nationally representative sample of students attending two- and four-year colleges. Additional support for the importance of this construct comes from studies conducted at residential, four-year colleges (Pascarella & Terenzini, 1983; Terenzini et al., 1985).

In contrast, others have found that subsequent goal commitment was not significantly associated with persistence. Studies conducted at nonresidential universities have failed to find a significant relationship between subsequent goal commitment and persistence (Allen, 1986; Cabrera et al., 1992; Pascarella, Duby, & Iverson, 1983). One researcher who used the model for examining persistence of disadvantaged students attending a commuter university concluded that subsequent goal commitment was not an important factor in distinguishing between students who returned for the second year and students who did not (Fox, 1986). Mallette and Cabrera (1991) evaluated the role of subsequent goal commitment in two comparisons of students from one residential institution. They determined that subsequent goal commitment did not contribute to a differentiation between students who persisted versus those who dropped out. But in a comparison of persisters versus transfer students, a significant association between persistence and
subsequent goal commitment was found. Students with higher goal aspirations were more likely to continue in school while lower goal aspirations were associated with transfer.

Goal commitment and academic integration.

Several studies have validated the hypothesized relationship between academic integration and subsequent goal commitment (Allen, 1986; Cabrera et al., 1992; Fox, 1986; Terenzini et al., 1985). Although student integration theory asserts that subsequent goal commitment is associated with academic integration and institutional commitment is associated with social integration, Cabrera et al. reported that academic integration was significantly associated with both subsequent goal commitment and institutional commitment with similar effect coefficients from academic integration to the two commitment variables. Pascarella et al. (1983) also reported that academic integration significantly influenced institutional commitment. Others have found that the degree of academic integration did not contribute to an explanation of subsequent goal commitment for students attending nonresidential institutions (Pascarella & Chapman, 1983; Pascarella et al., 1983). Some studies have determined that there was a strong relationship between students' initial aspirations and subsequent goal commitment, stronger than the theoretically hypothesized relationship between academic integration and subsequent goal commitment (Munro, 1981; Pascarella et al., 1983; Stage, 1988). In other words, initial aspirations were not altered by academic experiences.

Institutional commitment and persistence.

Social integration is hypothesized to influence students' institutional commitments. Both the number and quality of social interactions would be important to the establishment of the degree of commitment to the institution. Those more committed to the institution would be more likely to persist according to the theory. Some studies conducted at residential institutions are supportive of an association between subsequent institutional commitment and persistence (Mallette &
Cabrera, 1991; Pascarella & Terenzini, 1983); however, Stage (1988) reported that subsequent institutional commitment was significantly associated with persistence for women but not for men.

In studies conducted on primarily nonresidential campuses, the findings are mixed. Some have reported that subsequent institutional commitment was independent of persistence (Beil & Shope, 1990; Munro, 1981; Pascarella et al., 1983), while others have reported that institutional commitment was positively associated with persistence to the sophomore year (Allen, 1986; Cabrera et al., 1992). The studies by Allen and Cabrera and associates determined that institutional commitment was a more important factor than goal commitment in explaining persistence.

Institutional commitment was positively associated with persistence of older, community college students but was not a factor in the persistence of younger students (Grosset, 1991). Pascarella, Smart, and Ethington (1986) employed Tinto’s model to examine degree persistence over a nine year period for students who initially enrolled in two-year colleges. Subsequent institutional commitment was positively associated with degree persistence for men but was not an important factor for women. It is important to note that the measure of institutional commitment was for the last institution attended. In some instances it was a two-year college; but for students who completed a baccalaureate degree, it was a four-year college.

**Institutional commitment and social integration.**

There is some evidence that social integration is related to subsequent institutional commitment in residential settings (Cabrera et al., 1992; Pascarella & Terenzini, 1983, Stage, 1988) and among disadvantaged students at a commuter university (Fox, 1986). Other studies at commuter institutions have found no significant association between the degree of social involvement and levels of institutional commitment (Pascarella & Chapman, 1983; Pascarella et al., 1983). Contrary to theoretical expectations, Munro (1981) and Pascarella and Chapman (1983)
reported that institutional commitment was influenced by academic integration rather than social integration.

**Academic and Social Integration**

Academic and social integration are the key concepts of Tinto's model most commonly tested in persistence studies. Pascarella and Terenzini (1983) reported that the influences of the two integration variables on persistence were about equal in size for a residential student population. In another study at a residential university, social integration was not related to students' academic development during the freshman or sophomore years (Terenzini & Wright, 1987). The importance of social integration emerged only during the last two years, and social integration was more closely related to academic growth during the senior year than was academic integration.

**Social integration and persistence.**

Studies conducted at commuter institutions generally concluded that social integration did not contribute to an explanation of persistence (Allen, 1986; Beil & Shope, 1990; Donovan, 1984; Metzner & Bean, 1987; Nora, 1987; Nora, Attinasi, & Matonak, 1990; Pascarella & Chapman, 1983; Taube & Taube, 1990). Munro (1981) reported no significant relationship between social integration and persistence to the fourth year among a nationally representative sample of students attending both residential and commuter four-year colleges. Tinto (1987) observed that the social communities of nonresidential institutions are often substantially less extensive than at residential institutions which may account for the lack of support for the social integration construct.

Some investigators found partial support for the social integration construct. While satisfaction with social life was not associated with persistence to the fourth year, it was associated with persistence to the second year (Beil & Shope, 1990). Studying short-term persistence in a community college environment, Grosset (1991) concluded that academic integration was more
important than social integration for persistence and that integration factors were more important for younger students than for older ones. Only one study was supportive of the theoretically proposed positive relationship between social integration and persistence, and it examined persistence to baccalaureate degree completion over a nine year period for 825 community college students (Pascarella et al., 1986). Contrary to theoretical expectations, results from two studies in commuter four-year institutions (Fox, 1986; Pascarella et al., 1983) and one in a community college (Nora et al., 1990) evidenced a negative relationship between social integration and persistence.

Academic integration and persistence.

Most investigators reported that the extent to which students perceived their academic interests and needs were being met was an important, if not the most important, factor in the process of persistence (Allen, 1986; Beil & Shope, 1990; Bers & Smith, 1991; Cabrera et al., 1992; Donovan, 1984; Grosset, 1991; Lam, 1984; Munro, 1981; Nora et al., 1990; Nora & Rendon, 1990; Pascarella et al., 1983; Pascarella & Terenzini, 1983; Pascarella et al., 1986; Stage, 1988; Terenzini et al., 1985). Four studies in different two-year colleges resulted in the conclusion that student persistence was not affected by academic integration (Nora, 1987; Okun, Weir, Richards, & Benin, 1990; Taube & Taube, 1990; Voorhees, 1987). Nora studied persistence over three and four years for Chicano freshmen from three southwestern community colleges. The other three studies examined the relationship between academic integration and short-term persistence among new and continuing students; whereas, the majority of persistence studies limit the population to a cohort of new freshmen. An exception is the community college research of Bers and Smith (1991) which also included all enrolled students. Bers and Smith reported that academic integration contributed to the differentiation of persisters from nonpersisters but initial educational aspirations and employment status were more important factors.
College Grades

Consideration of college grades varied among researchers. Some included college grades as one of the indicators of academic integration (Allen, 1986; Bers & Smith, 1991; Cabrera et al., 1992; Fox, 1986; Nora et al., 1990; Voorhees, 1987). In studies which considered college grades and academic integration as separate variables, college grades were positively related to short-term persistence (Anderson, 1987; Beil & Shope, 1990; Donovan, 1994; Grosset, 1991; Mallette & Cabrera, 1991) and to degree completion (Anderson, 1987). At a residential university, poor college grades were associated with attrition; however, grades were not a factor in explaining which students would transfer (Mallette & Cabrera). Grosset determined that college grade average was associated with persistence for younger community college students but was not a significant factor for older students. For low-income, black students attending two- and four-year colleges, college grades were the most important determinant of persistence (Donovan).

Numerous researchers have used college grade average as the sole indicator of academic integration and most have concluded that college grades are significantly, positively associated with persistence of two-year college students (Brooks-Leonard, 1991; Fischbach, 1990; Peng & Fetters, 1978; Webb, 1989) and of four-year college students (Moline, 1987; St. John, 1989, St. John et al., 1991; Velez, 1985; Voorhees, 1985a, 1985b). Nora (1990) determined that college grades were less important to the persistence of Chicano community college students than were student aid resources. Terkla (1985) also found that college grade average was a minor factor in explaining persistence to degree completion. Two studies which included new and continuing community college students found that college grades did not contribute to the explanation of short-term persistence (Okun et al., 1990; Voorhees, 1987). The persistence rates of students enrolled in academic majors did not differ significantly from that of vocational majors (Fischbach, 1990; Grubb, 1989).
Initial Goals and Commitments

Studies at community colleges consistently found that students' initial goals and commitments were positively associated with persistence (Bers & Smith, 1991; Brooks-Leonard, 1991; Carroll, 1988; Daniels, 1990; Fredericksen, 1991; Taube & Taube, 1990; Voorhees, 1987). In national studies of two- and four-year college students, initial goals and commitments were significantly related to year-to-year persistence (St. John, 1989; St. John et al., 1991) and to persistence to degree completion (Anderson, 1987; Terkla, 1985; Velez, 1985).

Background Characteristics

The background characteristics frequently included in persistence research were gender, ethnicity, socioeconomic status, pre-college schooling, encouragement from others, and finance attitudes; but studies varied in the number and measures used to assess relationships between background characteristics and other variables, including initial goals and commitments, academic performance in college, and persistence. According to student integration theory, background characteristics were most important in the longitudinal process for their association with initial goals and commitments. Some have evaluated the influence of background characteristics on aspirations as a single construct (Donovan, 1984; Munro, 1981; Nora, 1987; Nora et al., 1990; Nora & Rendon, 1990); while others have looked separately at goal commitment and institutional commitment (Fox, 1986; Pascarella & Chapman, 1983; Pascarella et al., 1983; Pascarella et al., 1986; Terenzini et al., 1985). Background characteristics which have been positively associated with educational goals and commitments are student ability, achievement needs, encouragement from others, high school grades, perceived parental aspirations, parents' education, self-esteem, and socioeconomic status. Women have been found to be more committed to their institutions (Fox; Pascarella & Chapman; Pascarella et al., 1983) but less committed to educational goals than men (Pascarella et al., 1983). The impact of background characteristics upon academic performance in college has been well documented (Tinto, 1987).
With respect to relationships between individual background characteristics and the ultimate decision to persist in or depart from an institution of higher education, findings were inconsistent. Most studies employing Tinto's model have found little evidence of background characteristics having a direct association with persistence (Bean, 1980; Carroll, 1988; Donovan, 1984; Fox, 1986; Grossen, 1991; Lyons, 1991; Munro, 1981; Nora, 1987; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1983; St. John et al., 1991; Terkla, 1985; Terenzini et al., 1985). As Tinto predicted, students' backgrounds were associated with initial goals and commitments; but, once in college, persistence decisions were associated more with collegiate interactions than with background characteristics. Research that found one or more background characteristics to be significantly and directly associated with persistence is summarized according to the specific background characteristic which was related to persistence differences.

**Gender.**

Pascarella et al. (1983) found that ability and gender were significantly related to persistence in a commuter university. The authors speculated that students' experiences in commuter institutions may not be powerful enough "to totally mediate the influences of individual background characteristics on persistence" (p. 97). Like Pascarella and his associates, Voorhees (1987) and Peng and Fetters (1978) reported that women attending community colleges were more likely than men to persist. Using national databases including two- and four-year college students, others have reported men had higher persistence rates, when other factors such as ability and academic performance were held constant (Astin et al., 1982; Velez, 1985). Dey (1990) found that women attending four-year colleges were more likely to graduate within four years but there was no difference in graduation rates of men and women five years after entering college. In one commuter university men were more likely to graduate within four years but there was no difference in first year persistence rates of men and women (Beil & Shope, 1990). Stampen and
Cabrera (1986) reported that men were more likely to persist to the sophomore year, but there was no difference in annual persistence rates attributable to gender after the first year.

**Ethnicity.**

When high school performance, socioeconomic status, educational aspirations, etc. are controlled, ethnicity is an unimportant factor in the persistence process according to most of the research reviewed. Stampen and Cabrera (1986) found that white and Asian students attending public universities in Wisconsin were more likely to persist to the sophomore year and from the junior to senior year; however, they were unable to control for socioeconomic status or parental income. When Alexander, Riordan, Fennessey, and Pallas (1982) compared degree completion rates for a national population of white and black students, they observed that socioeconomic status had a greater net effect on degree completion than did ethnicity. Differences attributable to race were small and provided a slight advantage for black students, other things being equal.

**Socioeconomic status.**

Socioeconomic status was often defined as a multifaceted characteristic derived from two or more of the following: family's income, father's or parents' occupational status, father's or parents' educational attainment, and family's material possessions. Although most studies using Tinto's model have found that the effect of socioeconomic status was mediated by collegiate experience, Anderson (1987) determined that socioeconomic status was positively related to persistence to the third year for a national sample of community college students. Like Anderson, Peng and Fetters (1978) analyzed data from the National Longitudinal Study of the High School Class of 1972 (NLS) for community college students. Their regression analysis included student aid variables and a composite indicator of socioeconomic status. They concluded that the significant association between socioeconomic status and persistence was probably attributable to parental expectations rather than finances because none of the student aid variables analyzed was related to persistence. Astin et al. (1982) found that parental income was significantly related to
persistence for minority students but was not a factor for white students. Their study included controls for student aid and several indicators of preparation for college.

**Pre-college schooling.**

High school grade average or rank in class was significantly associated with short-term persistence (Anderson, 1987; Metzner & Bean, 1987; Moline, 1987; Nora, 1990; Nora et al., 1990; Peng & Fetters, 1978; Stampen & Cabrera, 1986) and with degree completion (Alexander et al., 1982; Terkla, 1985; Velez, 1985). An ability test score was considered by St. John et al. (1991) instead of high school grades. Net of collegiate experiences, ability was a significant predictor of annual persistence during the first two years but was not an important factor in the third to fourth year transition. Similar findings of the decreasing importance of ability scores or high school grades after the college freshman year have been reported (Brown, 1980; Stampen & Cabrera, 1986). Some studies that included both high school grades and ability test scores found a stronger relationship between high school and college grades than between ability test scores and college grades (Astin et al., 1982; Munro, 1981).

**Encouragement from others.**

Students who receive encouragement from significant others were more likely to persist in public four-year institutions (Cabrera, Stampen, & Hansen, 1990). Cabrera et al. (1992) determined that parental approval of college plans and encouragement from friends to remain in school were associated with institutional fit, a construct roughly equivalent to Tinto's construct of institutional commitment. Encouragement from others was, thus, indirectly related to persistence. Research involving community college students found higher initial aspirations were characteristic of students who received encouragement from others, and higher initial aspirations were associated with persistence (Nora, 1987; Nora et al., 1990). Trent and Medsker (1968) reported a significant connection between parental encouragement and persistence controlling for gender, ability and socioeconomic status among a national sample of two- and four-year college students. Students
who received high levels of parental encouragement were encouraged also by teachers and counselors while students who reported receiving little parental encouragement also reported little encouragement from high school sources.

**Finance attitudes.**

Students' finance attitudes have been tested as a background characteristic presumed to be associated with collegiate experiences that shape departure decisions (Cabrera, Stampen, & Hansen, 1990; Cabrera, Nora, Castaneda, & Hengstler, 1990; Mallette & Cabrera, 1991). Cabrera, Stampen, and Hansen used two indicators of ability to pay: socioeconomic status and the student's satisfaction with cost of attendance. Their inclusion of an attitudinal component represented a departure from the more traditional definition of socioeconomic status. Among a national sample of college students attending public four-year institutions, ability to pay was associated with persistence to the senior year and with subsequent goal commitment (Cabrera, Stampen, & Hansen). Students in the lowest (first) socioeconomic status quartile were significantly more likely to withdraw than those in the third and fourth quartiles, and those dissatisfied with attendance costs were more likely to withdraw from the institution. In addition to a direct association with persistence, Cabrera, Stampen, and Hansen found that ability to pay moderated the effects of goal commitment upon persistence. In other words, students were less likely to be committed to high education goals when their ability to pay was low.

Cabrera, Nora, Castaneda, and Hengstler (1990) relying on two attitudinal indicators of financial support determined that students' perceptions of their ability to pay at one commuter university were not directly associated with persistence but did have a direct effect upon their academic integration and commitment to the institution. Students who perceived no difficulties in meeting financial needs exhibited higher levels of academic integration and were more committed to the institution. Ability to pay was not significantly associated with subsequent goal commitment. Another study reported that institutional commitment, academic performance and
finance attitudes contributed most to the explanation of the difference between persisters and dropouts from one university (Mallette & Cabrera, 1991).

**History and Purposes of Student Aid**

The United States offers unparalleled access to postsecondary education as a result of reliance on more diverse sources of support (Hansen, 1991). State and federal taxpayers, students and their parents, institutions and philanthropic sponsors share the burden for financing higher education. The term "student aid" commonly refers to funds for grants, loans, and employment provided to students, institutions, or both (Sanders, 1975). This summary of the evolution of student aid programs available to students as of 1980 is limited to aid programs specifically targeted at individual students. Resources provided to institutions that result in generally lower costs for the students at recipient institutions are beyond the scope of this review.

Thinking of student aid today, one naturally thinks of aid emanating from state and federal sources; however, governmental aid to students is a relatively recent phenomenon. "Student aid is now 90 percent from public sources, as compared with 65 percent ten years ago; it was nearly zero percent from public sources before World War II" (The Carnegie Council, 1979, p. 4).

**Institutional and Private Aid Programs**

The first scholarship fund was established when Harvard College received in 1643 an endowment of 100 pounds with the income to be used for scholarships for needy students (Fenske, 1983). Many of the earliest scholarships were restricted grants with award conditions specified by the donors (Moon, 1975). In discussing the history of student aid, Moon asserts that "student aid has usually been a very practical educational tool, centered in an institution that has a specific purpose it wishes to achieve with money allocated to help students. The purposes have not always been altruistic" (p. 2). Another source of scholarships for needy, talented students was institutional reallocation of some tuition revenues, a sort of "Robin Hood" technique of charging
higher than needed tuition in order to reallocate some of the revenues for scholarships (Fenske, 1983). With increased competition for students brought about by the establishment of low-cost public colleges, independent institutions introduced loans, employment programs, and campaigns to stimulate special giving for scholarships to remain competitive throughout the nineteenth century (Moon).

In 1980-81, institutional and private aid sources provided over three billion dollars for student aid (Fenske & Huff, 1983). Institutions determine the specific purposes for which monies will be used, such as recruitment of talented students or varying the diversity of their enrollments with respect to ethnicity, socioeconomic status, or geographic origin. According to Fenske and Huff, financial need was a criterion for the vast majority of recipients in 1980-81.

State Aid Programs

In the early 1900's, the first state student aid programs were initiated in Connecticut, New York, and Pennsylvania to serve different state purposes (Marmaduke, 1983). It was not until the late 1950's that several other states established student aid programs. Marmaduke attributed this surge in new state programs to concern for the preservation of private colleges and impending enrollment increases. By 1973, 23 had general scholarship programs and all states had loan programs (Godzicki, 1975). The 1972 Amendments to the Higher Education Act of 1965 included a provision for State Student Incentive Grants (SSIG) whereby states could receive matching funds from the federal government for state dollars spent for undergraduate student grants. "The goals for SSIG, as determined by the Department of Education's regulations interpreting the law, were (1) to encourage the creation of state student grant programs and (2) to encourage increased state expenditures on such programs" (Marmaduke, 1983, p. 70). By 1977 all states offered student grant programs.

Boyd (1975b) observed that state aid programs initially were categorical ones with student eligibility tied to a specific vocational choice, residence in a legislative district, military service, or
other special criteria. In many states, categorical programs were replaced with comprehensive ones with student eligibility determined primarily on the basis of student need. Demonstrated academic achievement or potential was required for 68.5 percent of all state awards in 1969 compared to 20.6 percent by 1979 (Marmaduke, 1983). Some states allow recipients to attend public or private institutions while other state programs are restricted to students who attend public institutions or to students at private institutions (Boyd, 1975b; The Carnegie Council, 1979). Five states (New York, Pennsylvania, Illinois, California, and New Jersey) accounted for over half of all state aid awarded in 1980-81 (Fenske & Huff, 1983).

Depending upon the level of funding available, comprehensive state student aid programs have served one or more of the following purposes:

1. to give students the opportunity of access to postsecondary education;
2. to preserve diversity (a balanced public/private system) by giving students a reasonable choice among institutions;
3. to supplement other sources of funds (from the student, from his parents, and from federal and institutional sources);
4. to conserve public funds by making it possible for financially needy students to utilize otherwise unused spaces at nonpublic colleges (reducing the need for direct-support funds);
5. to permit a student's in-school employment workload and/or loans to remain sufficiently modest as not to affect his studies or future plans adversely" (Boyd, 1975a, p. 120).

Three other factors contributing to the development of state student aid programs were identified by Boyd (1975a). One was the awareness of state legislators of the political advantages garnered from individual awards to many students compared to relative invisibility of institutional awards. Some states have used student aid programs to justify tuition increases at public institutions and/or to financially support private institutions indirectly since direct assistance was prohibited by their state constitutions. Fenske, Boyd, and Maxey (1979) concluded from repeated
surveys of state aid recipients over a nine-year period that state aid had contributed to the continued viability of private colleges in Illinois. Without state grants and scholarships, many students reported that they would not have attended college or that they would have attended a public four-year college instead of a private college. Over the years of the study, an increasing percentage of private college students indicated that they would have attended a public two-year college instead of a private college in the absence of state aid.

Federal Aid Programs

The federal government has responded to a wide range of national interests in establishing student aid programs. The programs that existed in 1980, similar to the programs currently available, represented a conglomeration of programs rather than a "coherent national policy" (Fenske, 1983, p. 11). The first large federal program of student aid was created by the Serviceman’s Readjustment Act in 1944, the GI Bill of Rights, and was continued with modifications by subsequent legislation (Mohrman & Stroud, 1991; Sanders, 1975). Military service was rewarded through provision of a living and tuition allowances for veterans who elected to seek postsecondary training. In addition to serving as a form of delayed compensation, the GI Bill effectively delayed an influx of veterans into the job market. By 1980 the GI Bill had been replaced by the Veterans Education Assistance Program (VEAP) under which contributions by participating servicemen were matched by the federal government (Gladieux, 1983).

The National Defense Education Act (NDEA) authorized in 1958 federally subsidized loans to undergraduate college students. Loan provisions included preference to students majoring in mathematics, science, or foreign languages and partial cancellation of the debt for students who taught in elementary or secondary schools (Gladieux & Wolanin, 1976; Hartle, 1991). This legislation also marked the beginning of the significant role the federal government would eventually have in higher education finance. Although planned as a temporary, emergency effort,
a modified version of the loan program created by NDEA has been continued. Known today as the Perkins Loan, it was called the National Direct Student Loan (NDSL) in 1980.

"Americans' belief in education as the vehicle for social mobility, combined with a heightened sense of responsibility for providing equal opportunity" (Mohrman & Stroud, 1991, p. 149) led to a series of legislation in the early 1960's targeted toward students with economic need. The College Work-Study Program provided federal subsidy to institutions for the employment of financially needy students. The Higher Education Act of 1965 authorized the Educational Opportunity Grant Program for financially needy students, and the Guaranteed Student Loan (GSL) Program for middle income students. While funds for Guaranteed Student Loans (now called Stafford Loans) come from private lenders, federal funds are used to guarantee lenders against default, to pay loan interest while borrowers attend college, and to subsidize through a special allowance paid to lenders the low interest rates charged to students (Hansen, 1991). Also in 1965, Congress extended educational benefits of the Social Security Act to college age dependents of disabled or deceased workers (Hansen, 1991; Hartle, 1991).

The Higher Education Act of 1965 "recognized the need for federal support of higher education institutions, as well as the need for equal access to higher education for all Americans, regardless of an individuals' economic status" (Fenske, 1983, pp. 11-12). This dual approach of federal support for institutions and for student aid was altered by passage of the Education Amendments of 1972 when student aid became the priority for federal support of higher education. With the 1972 legislation, Congress reinforced the national commitment to equal opportunity.

Writing of the Education Amendments of 1972, Gladieux and Wolanin (1976) concluded that it lacked "a systematic, fully coherent philosophy, for the legislation amalgamated a variety of purposes, values and ideas" (p. 224). Of the broad themes Gladieux and Wolanin identified from analysis of the legislation and its history, some represent a continuation of earlier policies and
others are an enunciation of some choices which had not been clearly established before this legislation. The following are some of the themes recognized by Gladieux and Wolanin:

1. The lack of money should not be a barrier to postsecondary education. Toward that end, the Basic Educational Opportunity Grant (BEOG) program was created to provide early assurance to low and moderate income students that a minimum amount of financial support ($1,400) would be available from family resources and federal grant aid. Students with demonstrated need could receive up to $1,400 or one-half the cost of attendance, whichever was less.

2. Students should have not only equality of access, but also equality of choice among institutions.

3. States continued to have the primary responsibility for financial support of higher education; however, there would be federal support for the establishment of state programs, such as the State Student Incentive Grant (SSIG), to achieve the federal priority of equal opportunity.

4. Students and institutions, formerly excluded from participation, were included with references to "postsecondary education" and "occupational preparation."

5. The act reauthorized existing student aid programs: College Work-Study (CWS), NDSL, and Educational Opportunity Grants which were renamed Supplemental Educational Opportunity Grants (SEOG). To ensure that these programs would not be jeopardized as funding for new programs was sought, the legislation mandated that they be funded at the 1972 level before any BEOG payments were made.

Tax credit for college tuition, which had been proposed in 1964 and 1972 without success, was again considered in the late 1970's as middle-income families sought more federal support (Gladieux & Wolanin, 1976; Hansen, 1991). Instead, Congress approved the Middle Income Student Assistance Act (MISAA) in 1978. The formula for calculating student eligibility for
BEOG was modified by MISAA so that some students whose family incomes formerly made them ineligible for the grant were now eligible. In addition, any student regardless of family income could receive a GSL.

The purchasing power of federal student assistance peaked in 1980-81 and declined for the next several years (Hansen, 1991). The 1980's were characterized by a number of changes designed to curb federal student aid spending. MISAA was repealed and Social Security survivor benefits for college students were discontinued.

According to Hansen (1991) "equalizing opportunity was the explicit rationale for the creation of most federal student aid" (p. 13), but the goals and intended beneficiaries are ambiguous. Gladieux and Wolanin (1976) observed that some of the policy issues of the Education Amendments of 1972 were "voiced again and again but only in catch phrases that were more frequently incanted than analyzed" (pp. 223-224).

**Characteristics of Student Aid Recipients**

**Family Income**

Grants are awarded primarily to students from low income families while middle and high income families are more frequent participants in loan programs (The Carnegie Council, 1979; Merisotis, 1987; Stampen & Cabrera, 1988; Stampen & Fenske, 1988). Data from the 1975-76 Carnegie Council survey of undergraduates disclosed that the average amount of aid and the amount received from each public program declined as parental income increased, with the exception of student loan programs. The relationship between parental income and receipt of aid was stronger for federal aid programs, excepting the GSL program, than for state aid programs.

Results from Merisotis (1987) analysis of federal aid recipients between 1972 and 1984 revealed that the distribution of federal aid changed over time. After the BEOG was created in 1972, campus-based aid (SEOG, CWS, NDSL) was increasingly awarded to higher income
students. The trend of more aid to higher income students peaked in the early 1980's as a result of the Middle Income Student Assistance Act (MISAA) which expanded aid eligibility of students from middle income families. By comparing the maximum family income at which a dependent student from a family of four would qualify for a BEOG, Mortenson (1988) determined that MISAA extended BEOG eligibility to dependent students with family incomes between $16,000 and $25,000. Given that the national median family income in 1978 was $17,640, MISAA resulted in vast increases in the number of students eligible for BEOG.

While the number of eligible students increased after 1978, the maximum BEOG provided decreased from $1,800 in 1979 to $1,674 in 1982. At the same time the average costs of attending a public, two-year college increased as did costs at other institutions (Mortenson, 1988). Although the number of awards increased between 1979 and 1984, the inflation adjusted dollar value of the average award from BEOG and campus-based federal programs declined (Merisotis, 1987). Rising college costs, increasing numbers of eligible students, and the decreasing size of individual BEOG awards contributed in the late 1970's to loans becoming the predominant source of student aid (Stampen & Fenske, 1988).

Another trend observed by Hansen and Stampen (1986) and Merisotis (1987) was the decreasing proportion of aid awarded to dependent students resulting from increased participation by independent students. According to a 1981-82 national survey, 63 percent of all need-based aid recipients attending public institutions were dependent students; however, only 52 percent of recipients attending public, two-year institutions were dependent students (Stampen, 1983).

Given the purposes of student aid, a difference between the family or parental income of aid recipients and other students would be expected. While several have reported that income was one of several factors contributing to an explanation of student aid variations (Augenblick & Hyde, 1979; Bishop, 1989; Caplan, 1980; Grubb & Tuma, 1991; Merisotis, 1987; Venti, 1983), two investigations revealed the only personal characteristic that distinguished between need based aid
recipients and other students was income (Stampen & Cabrera, 1988; Stampen & Fenske, 1988). A comparison of student aid recipients, applicants who did not receive aid and a control group of other freshmen attending one university determined that recipients had significantly lower socioeconomic status than the other two groups (Jensen, 1984). Unlike Stampen and his associates, Jensen noted differences among the groups in addition to the income related one. Aid applicants had significantly higher entrance test scores and high school grades than either of the other two groups, but there was no difference among the groups in the freshmen year grades earned.

**Personal and Academic Characteristics**

Venti (1983) analyzed need, merit and personal characteristics of a national sample of 1972 college freshmen to determine the relative importance of selected characteristics in explaining whether grant or scholarship aid was offered to students. Variables used to evaluate the importance of need were parents' income, the number of dependents in the household, and tuition of the college attended. The student's Scholastic Aptitude Test (SAT) score, rank in class, being a leader in high school student government or athletics, the proportion of the student's class that attended college, and the average freshman SAT score at the college attended were measures of merit characteristics. The personal characteristics considered were gender, ethnicity, geographic region, and whether the high school attended was a rural one.

The average freshman SAT score, used to indicate college quality, was not associated with aid offers; however, other need, merit, and personal characteristics were related to student aid offers. Contrary to expectation, some of the merit characteristics were about as important in explaining student aid as were the need variables. Tuition followed by parents' income were the most important need-related factors. The most important merit characteristics were student's SAT score, class rank, and leadership in high school athletics. Net of the effects of other variables, non-white students received considerably higher average aid offers than white students and men.
received somewhat more aid than did women. Separate regression equations were estimated for students attending two- and four-year colleges. Although aid offers at two-year colleges were estimated to be about $1,100 less than those at four-year colleges, the relative importance of most variables were roughly the same at the two types of institutions. An exception was tuition which was about twice as important at two-year colleges than at four-year colleges.

Although the BEOG program was nonexistent in 1972, some of Vanzi's (1983) findings have been confirmed in more recent national studies of student aid recipients. Freshmen from the 1975 Cooperative Institutional Research Program plus a random sample of students enrolled in 44 proprietary institutions were surveyed in 1977 by Caplan (1980) to determine the characteristics of aided men and women. Stepwise multiple regression was used to identify variables useful in explaining variations in types and amounts of student aid received. Parental income, high school grade average, ethnicity, major, age, gender, and institutional characteristics of control and level were the independent variables considered. She determined that student characteristics associated with higher total amounts of aid were being black, reporting low parental income, having above average high school grades, and being an engineering or health major. There were no significant differences in the types or amounts of aid received by men and women, net of the influence of other factors. According to a descriptive profile of unduplicated recipients of federal student aid recipients, minority students are over-represented, particularly in the BEOG program (The Carnegie Council, 1979). More than half of the recipients were women, although only 47 percent of total college students were women.

Stampen (1983) collected data from nearly 12,000 students attending 226 public colleges and universities in 1981-82. He concluded "student aid programs do what they were originally intended to do. They distribute dollars - mostly federal - to students who would otherwise have difficulty financing a college education" (p. i). When comparisons by gender and ethnicity were based on the proportion of total costs paid by student aid, there were no significant differences. Men and
white students received more aid than women and non-white students, respectively; but the
differences were attributable to the costs of institutions attended. Black, Hispanic, and American
Indian students were concentrated in two-year colleges and lower-cost, comprehensive colleges.
More women attended public two- and four-year colleges while men outnumbered women in more
expensive private institutions (Moran, 1986; Stampen, 1983).

Using student specific data from the HSB longitudinal database and institutional data from
the Higher Education General Institutional Survey (HEGIS) file, Lee (1988) sought to determine
whether financial subsidies were "equitably distributed among students from different income
groups, racial and ethnic background and ability levels" (p. 45). The amount of money an
institution spent per undergraduate student, including student aid resources, less the tuition paid
by the student was defined as total education subsidy. The average total subsidy in 1980 was about
$3,400. The subsidy was, in some cases, in the form of student aid and, in other cases, in the form
of low tuition. Hispanic students received significantly less total subsidy than the average, and
black students received significantly more than the average. Among the student characteristics of
income, ethnicity and ability, student ability had the strongest relationship to the amount of total
subsidy. Students in each ability quartile received significantly greater total subsidy than students
in the next lower quartile. There was also a significant positive relationship between the amount
of student aid received and student ability.

Grubb and Tuma (1991) estimated combined and separate regression equations for the
receipt of student aid by undergraduate students enrolled in public four year, private four year,
public two year, public vocational-technical, and proprietary institutions. The following student
characteristics were established to significantly increase the probability of receiving aid: low
parental income, living on campus (versus living off campus), having more than three dependents,
having a degree objective (versus no or an other objective), planning to earn an associate rather
than baccalaureate degree, enrolling in more credit hours, being of traditional rather than non-
traditional college age, and being a black student. Hispanic students were more likely to receive federal aid than white students, but there was no significant difference in the probability of receiving aid from total sources considered. Students attending institutions with higher tuition were, also, more likely to receive student aid. The probability of receiving aid was increased by 1.9 percentage points with each additional $1,000 in tuition charged.

Institutional Characteristics

Differences based on ethnicity and student ability may be attributable to the institution chosen. Lee (1988) speculated that high ability students were more likely to attend higher cost colleges. It is possible, too, that low ability students were concentrated in two-year public colleges where admission requirements were more liberal. Hispanic students were more likely to attend two-year public colleges where Lee found substantially lower average subsidy than was provided by either public or private four-year institutions. In 1980, the average annual subsidy for public, two-year college students was slightly less than $2,000 while averages for four-year colleges were greater than $4,500. The total subsidy provided to public and private four-year college students was about the same although the source of the subsidy differed. Students attending private colleges received more than twice as much student aid as students in public four-year colleges, but public college students benefitted from subsidies in the form of lower tuition. While public two-year college students are charged low tuition, also, the amount of money two-year colleges spent per undergraduate student was less than other institutions; therefore, the total subsidy received by the student was less.

Caplan (1980) concluded the best predictor of both the total amount of aid and the receipt of multiple sources of aid was the institutional category. Students attending private universities or colleges were more likely to receive aid from more than one source. Since private institutions generally charge higher tuition than public ones, this finding is analogous to Venti's (1983) conclusion regarding the importance of tuition. Breneman and Nelson (1981) examined 1978-79
state data to explore the relationship between tuition and state aid for students attending two- and four-year institutions. While states with higher average tuition provided more funds for student aid, the difference was associated with a higher percentage of full-time students receiving aid. The size of the average state grant was not significantly related to tuition, particularly in two-year colleges.

Two-year institutions had the smallest percentage of students receiving aid and the lowest average amount of total assistance (Stampen, 1983). Of the total sample, 31 percent received some type of aid and 23 percent received aid based upon demonstrated need. Among two-year college students, only 19 percent received aid and 15 percent received need-based aid. Differences in student aid were attributed by Stampen to the low rates of loan participation by two-year college students and lower average awards going to aid recipients at two-year colleges. Tuition at the two-year colleges was the lowest of the five institutional types included.

Recently two investigations of student aid recipient characteristics have relied on data from the National Postsecondary Student Aid Study, a national database of students enrolled in higher education in the fall of 1986 (Bishop, 1989; Grubb & Tuma, 1991). Bishop determined that a composite measure of institutional control and student cost was the most important factor in explaining the amount of aid students received. The second and third most important were family income and institutional level (two- or four-year), respectively. Personal characteristics of gender, ethnicity, age, parental dependency, and marital status accounted for less than two percent of the variation in student aid awards.

Controlling for the effects of student characteristics, including tuition, the type of institution attended was significantly associated with differences in the probability of receiving student aid. Students attending proprietary institutions were most likely to receive aid while students in public community colleges and vocational-technical schools were least likely to receive aid. Attending a
private four-year college rather than a public one was associated with increased probability of receiving student aid (Grubb & Tuma, 1991).

Research Regarding Student Aid and Persistence

Comparisons of the empirical evidence regarding the relationship between student aid and persistence are difficult due to the variety of approaches adopted by researchers. One line of inquiry has sought to determine whether there were differences in the persistence or graduation rates among students who received different forms or amounts of student aid. As Porter (1991) notes, comparisons among aid recipients assumes that student aid contributes to student persistence.

Comparisons among Aid Recipients

Research supports the conclusion that grants are positively associated with year to year persistence and with increased rates of graduation (Astin, 1975; Astin et al., 1982; Hochstein & Butler, 1983; Iwai & Churchill, 1982).

The findings with regard to the effects of student loans are mixed. Loans as the only form of aid received has been associated with increased withdrawal rates (Hochstein & Butler, 1983), particularly among minority students (Astin et al., 1982; Mortenson & Wu, 1990). Other institutional studies have found no difference in the propensity to withdraw among recipients of different types of student aid (Davenport, 1991; Moline, 1987; Voorhees, 1985a, 1985b). Voorhees reported that receipt of a loan, the NDSL, had a statistically significant positive effect on college grades and on persistence, as did student employment through the CWS program.

Some of the institutional researchers who have investigated the association between persistence and the amount of aid received have concluded that the amount does not significantly influence persistence (Allen, 1986; Grosset, 1991, Jensen, 1981; Moline, 1987). In an urban
community college study, Grosset (1991) concluded that the amount of aid received was not
associated with persistence of traditional age students nor older students.

Like Grosset (1991), Nora (1990) and Voorhees (1985a, 1985b) were guided by the student
integration model in their institutional studies of the net effects of differing amounts of aid; and
both concluded that higher amounts of aid were associated with persistence. The amount of aid
received by Hispanic community college students had a stronger effect on persistence than did
academic performance (Nora). The amount of grant support was a major factor associated with
persistence of black students (Astin, 1975). Leslie and Brinkman (1988) conducted meta-analysis
of seven persistence studies which compared student aid recipients based on the amount of aid
received and concluded that the amount of aid received had a positive impact on persistence.
Recently St. John (1990) evaluated the effects of differing amounts of awards on the probability of
year-to-year persistence using the HSB national database. Increases in the amount of grant and
loan awards were positively associated with persistence to the second and third years.

Aid Recipients Compared with Other Students

Grant recipients.

In comparisons of student aid recipients with other students, some researchers have found
support for the conclusion that receipt of grants is positively associated with persistence
(Blanchfield, 1972; Brown, 1980; Carroll, 1987; Jensen, 1981, 1984; St. John, 1989; St. John et al.,
1991). St. John et al. examined the year to year persistence rates of recipients of various aid
combinations and of unaided students and found generally that receipt of grants alone or in
combination with other forms of aid improved the probability of persistence; however, different
combinations of aid resulted in significant increases in persistence during each of the annual
transitions examined. For example, there was no significant association between persistence and
the receipt of only a grant during the first year. It was only the grant and loan combination that
contributed to an increased probability of persistence to the second year. Recipients of a grant
and loan were 5.4 percentage points more likely to persist than were other students. Persistence from the second to the third year was enhanced by the receipt of grants alone or in combination with loans and/or work. Students who received a grant and loan were 10.6 percentage points more likely to persist to the third year than were other students. Leslie and Brinkman (1988) posited that the relatively large effect sizes noted for grant-loan combinations may reflect the effects of larger amounts of aid since combinations are likely to involve more total aid than singular awards.

Comparing BEOG recipients with nonrecipient control groups, no significant differences in the persistence rates or graduation rates of the two groups were observed (Bergen & Zielke, 1979; McCreight & LeMay, 1982; Taylor & Rafetto, 1983). Taylor and Rafetto found that nonrecipients earned higher college grades than did grant recipients at one community college; however, they did not control for prior academic performance or ability. With controls for student ability, studies conducted at universities determined that there was no difference in the college grades earned by grant recipients compared to nonrecipients (Bergen & Zielke; McCreight & LeMay).

**Loan recipients.**

As was the case in comparisons among aided students, comparisons of student loan recipients with other students have produced inconsistent results. Students who relied on loans as the only source of aid during the first year were less likely to return for the second year than students who received loans combined with other aid sources (Brown, 1980) or students who did not receive aid (Carroll, 1987). After the first year, Brown found no difference in the persistence rates of loan users compared to other students. St. John (1989) compared the annual persistence rates of students from the 1972 NLS and the 1980 and 1982 graduating students from the HSB databases. Loans as the only source of student aid during the first year was negatively associated with persistence for the 1972 population, was positively associated with persistence for the 1980 population, and was insignificant as a factor related to persistence for the 1982 population. Across all three populations there was no significant difference in the persistence rates of students
who received only loans as compared to all other students. St. John concluded that students’ negative attitudes about loans had changed by the 1980’s.

Student aid in general.

By comparing aid recipients with other students, researchers have attempted to discover whether some sources of aid were more conducive to persistence than others and to answer the larger question of whether student aid contributes to the persistence of students, with other relevant factors being held constant. In national studies of the relationship between persistence and student aid in general, some have concluded that student aid has a small, positive influence on student persistence (Carroll, 1987; Riccobono & Dunteman, 1975; St. John et al., 1991; Terkla, 1985).

Carroll’s (1987) study included only full-time, four-year college students, and he controlled for the effects of family income. Riccobono and Dunteman (1975) found that the positive relationship between student aid and persistence among community college students remained after controlling for student ability. St. John et al. (1991) concluded that, net of several other factors, student aid was associated with year-to-year persistence. Terkla (1985) evaluated the relationship between receipt of student aid and completion of an associate or baccalaureate degree within six years. She concluded that student aid recipients from two-year and four-year colleges were more likely to complete degrees than students without aid, controlling for student background, academic performance, degree level goal, and institutional characteristics.

One multivariate analysis including controls for student background and ability found that recipients of student aid at a university were significantly less likely to be enrolled four years after entry than were students who did not receive aid (Beil & Shope, 1990). At the end of the first year of enrollment, there was no significant difference in persistence rates of student aid recipients and nonrecipients.
Meta-analysis of 46 studies conducted between 1953 and 1986 revealed that receipt of student aid had a "less than small but significant positive effect on student persistence" (Murdock, 1987, p. 91). In a separate analysis of seven studies that controlled for student ability via matching, there was no significant difference in the persistence rates of aid recipients and nonrecipients. A very limited number of studies had been conducted with two-year college students and none that Murdock included in the meta-analysis controlled for the students' educational objectives; however, she concluded that student aid appears to have a more positive impact on the persistence of two-year college students than four-year students.

Murdock's (1987) analysis did not include the study by Peng and Fetters (1978) of 1,378 students enrolled in academic programs in two-year colleges. Net of the influences of student ability, achievement and aspirations, Peng and Fetters found no significant association between persistence over two years and the receipt of either grants or loans. Fredericksen (1991) compared the annual persistence rates of students entering a community college from 1986 to 1990 and found that student aid recipients were more likely to persist than were nonrecipients; however, there was no consideration of prior academic performance.

Stampen and Cabrera (1986, 1988) compared three groups of student aid recipients with nonrecipients based upon a classification system that accounted for the criteria used to award aid. Students who received aid based upon the more rigorous means tests were placed in a high need category. Students who did not qualify for the high need category but had demonstrated need were placed in a second category while recipients of merit or other non-need based awards were placed in a third category. The three groups of student aid recipients had year-to-year persistence rates similar to one another and to the nonrecipients. Significant differences among the groups were attributable to differences in high school performance and ethnic background rather than the source of financial support. Students who relied primarily on loans, the second category of aided students, did not differ appreciably from nonrecipients. This finding is consistent with St. John's
(1989) conclusion that reliance on student loans is no longer associated with higher rates of attrition.

**Student Employment**

**College work-study programs.**

Among aid recipients and in comparisons of aid recipients with nonrecipients, participation in college work-study programs has been positively associated with increased rates of persistence and graduation (Astin, 1975; Astin et al., 1982; Herndon, 1984; Velez, 1985; Voorhees, 1985a, 1985b). Astin (1975) concluded that grants and college work-study were more effective when either was awarded rather than when packaged with other types of aid. He found that black students were more likely to participate in college work programs during the freshman year than were other students and that participation was associated with a substantial increase in persistence of black students. Although Astin's study preceded the establishment of the BEOG program, his finding was supported by a recent institutional study (Porter, 1986). Porter found that receipt of grants and work-study awards were important to the persistence of ethnic minority students during the first year at a university but comparisons among ethnic majority students who received different types of aid revealed no significant differences in persistence rates. Porter speculated that the work awards may have contributed to the process through which the minority students established greater commitment to the institution.

Herndon (1984) reported that college work-study was the only form of student aid which discriminated between persisters and dropouts. In a study of campus-based aid recipients, college work-study had a statistically significant positive effect on college grades and on persistence (Voorhees, 1985a, 1985b). Participation in a work-study program was associated with increased probability of earning a baccalaureate degree for a national sample of two- and four-year college students (Velez, 1985).
Other researchers have concluded that there is no relationship between work-study participation and persistence. Unlike Voorhees (1985a, 1985b), VandeWater and Augenblick (1987) found no significant association between participation in work-study programs and college grades in a comparison of student aid recipients from 12 two- and four-year colleges in Washington. While the number of hours worked was not a significant predictor of college grades, VandeWater and Augenblick observed that increases in the number of hours worked, up to 20, were associated with higher college grades. Working was estimated to increase the time required to graduate by about one-third of one academic term. When St. John (1989, 1990) compared the annual persistence rates of three national samples of students, he determined that very few students received student aid in the form of work only. Neither an increase in the amount of the student work award nor the receipt of an aid package including work was associated with a substantial improvement in the probability of persistence to the second year, except for the 1982 cohort when work was combined with a grant and a loan.

**Employment in general.**

Another line of inquiry has sought to determine whether there was a relationship between employment while in college and persistence, irrespective of whether the employment resulted from the student aid process. Among community college students, some research indicated that students who worked during the first year were more likely to drop out than students who did not work (Halpin, 1990). With controls for student ability, others have found no difference in persistence of students who were employed compared to those who were not employed (Knight, 1991; Metzner & Bean, 1987; Okun et al., 1990; Pascarella & Chapman, 1983; Pascarella et al., 1983; Peng & Fetters, 1978; Webb, 1989). While Peng and Fetters found that employment was negatively associated with persistence among four-year college students, they observed no difference in the persistence rates of two-year college students who worked compared to those who did not.
Number of hours worked.

When researchers considered the effects of employment in terms of the number of hours worked, most found that increases in the number of hours of employment is negatively associated with persistence (Anderson, 1987; Chacon, Cohen & Strover, 1986; Ehrenberg & Sherman, 1987; Gleason, 1991; Grosset, 1991; Grubb, 1989). The number of hours worked was a significant predictor of persistence among traditional age, community college students but was not a factor in the persistence of older students (Grosset). Anderson found that employment hours was a significant determinant, net of several other factors including ability, of persistence for students attending two-year or four-year commuter colleges but was not a factor for students attending other colleges. Ehrenberg and Sherman studied a nationally representative sample of men attending two- and four-year colleges and concluded that employment during college had a greater effect on men attending two-year colleges. Increases in the number of hours worked had an adverse effect on the probability of persistence and the probability of graduating on time for men attending two-year colleges.

While the number of employment hours has been related to decreased persistence, employment hours did not appear to affect college grades (Ehrenberg & Sherman, 1987; Metzner & Bean, 1987). Gleason (1991) found that increased work hours was associated with lower grades; while statistically significant, the effect was very small. Working 30 hours per week was estimated to lower students' grade averages by .05 points. In a study of all full-time students attending a two-year college, Taube and Taube (1990) determined that working more hours was associated with higher second-term grades.

Others have found that full-time employment was associated with decreased probability of persistence but that part-time employment was associated with increased probability of persistence (Astin, 1975; Astin et al., 1982; Bers & Smith, 1991; Brooks-Leonard, 1991; Hunter & Sheldon, 1980; Keim, VanAllen, & Anderson, 1982; McLean, 1986).
Summary

From this review several factors were identified as being associated with persistence of community college students. Constructs from student integration theory which have been validated in studies including community college students are: subsequent goal commitment, external commitments in the form of full-time work, academic integration, college grades, and initial goals and commitments. The review revealed that some studies found selected background characteristics have been directly associated with persistence of community college students, but the majority of research based upon student integration theory determined that students' collegiate experiences were more important than their background characteristics in the longitudinal process determining persistence or departure. In studies involving nonresidential students, there were mixed findings on the relationship between persistence and the constructs of institutional commitment and social integration. Neither institutional commitment nor social integration appeared to be important to the explanation of persistence behavior.

There was no conclusive evidence on the relationship between forms of student aid and persistence. It appeared that receipt of aid, in general, may have a very small, positive relationship with persistence. Grants and work programs appear to be positively related to persistence. There were some reports of a significant difference in persistence of grant and work award recipients compared to other students, while others found no significant differences. Some investigators concluded that loans were negatively associated with persistence, while more recent studies suggest that loans may have a positive association with persistence.

Most student aid emanates from public sources, i.e. state and federal governments. Although programs vary, most institutional, state, and federal programs include financial need as a criterion for awards. By the late 1970's loans had replaced grants as the most prevalent form of student aid with grants going primarily to low income students. Community college students were less likely to receive student aid compared to other students. Student aid recipients compared to
nonrecipients were more likely to be from low income (or low socioeconomic status) families, attending institutions with high tuition, from an ethnic minority, have higher college entrance test scores, and have higher high school grades (or class rank).
CHAPTER THREE
MODEL AND METHODOLOGY

The conceptual model to be tested is presented in the first section of this chapter. The remainder of the chapter is devoted to the methodology for the study, including a description of the database, procedures for selecting the sample, operational definitions of the variables, and analytical procedures.

The Model

The primary purpose of this study is to test a conceptual model for assessing the effects of student aid on community college student persistence. The model (Figure 2) is based upon student integration theory with the addition of student aid as an important construct in the process of persistence as determined by St. John et al. (1991). Contrary to student integration theory, St. John et al. did not include the construct of social integration in their analysis. Given the lack of research support for the social integration construct in explaining persistence among community college students, the model to be tested does not include the social integration construct. The variables are arranged in a recursive model consistent with the theoretical relationships among the variables and the time order in which measures were taken. The model posits that persistence is a function of pre-entry attributes, educational expectation, collegiate experiences, and subsequent goals and commitments.
Figure 2. Path Diagram of Conceptual Model of Student Persistence
Methodology

High School and Beyond Database

High School and Beyond (HSB) was the second major longitudinal survey instituted by the National Center for Education Statistics (NCES) to collect information about the educational, vocational, and personal development of high school students (Sebring, Campbell, Glusberg, Spencer, & Singleton, 1987). Like the first survey, the National Longitudinal Study of the High School Class of 1972 (NLS), HSB consisted of surveys at regular intervals. There were two cohorts of students, high school sophomores and high school seniors, surveyed in 1980 and at two year intervals, concluding in 1986. This description from Sebring et al. pertains to the base year, 1980, and first follow-up surveys of the senior cohort from which the sample for the present study was drawn.

The HSB sample design was a two-stage, highly stratified national probability sample. More than 1,100 high schools were selected in the first stage including planned over-sampling of schools meeting special criteria, such as Catholic schools with high minority group enrollments, public schools with high percentages of Hispanic students, and private schools with high-achieving students. Within each high school 36 seniors were randomly selected, school size permitting, for base year survey participation. More than 28,000 seniors completed the base year survey in the spring of 1980 in an on-campus administration of the questionnaire followed by cognitive tests. Each senior selected for participation in the base year had a chance of being selected for the first follow-up sample. The first follow-up survey was mailed to 11,500 base-year participants and 495 base-year nonparticipants in the winter of 1982. About 75 percent of the students responded to the survey by mail, and an additional 19 percent of the questionnaires were completed as a result of telephone or in-person interviews.

The base-year student questionnaire included items related to family background, high school experiences, employment outside school, and educational and occupational aspirations.
Many of the items were asked again on the first follow-up questionnaire administered two years later. In addition, the first follow-up questionnaire queried students about their postsecondary schooling, school financing, and employment.

Sample for the Study

The data file from HSB for the students who completed the first follow-up questionnaire contained 11,227 individual student records. For most students the file also included the students’ responses to the base-year questionnaire. The NCES created several composite variables using responses from two or more questionnaire items for the convenience of researchers. One of the composite variables was the activity state variable which indicated whether each participant was enrolled in some form of postsecondary education at various times after high school graduation. The activity state variable also reflected whether the postsecondary institution was public or private, was two-year or four-year, and whether the student was enrolled full-time or part-time. This composite variable was used to select all HSB 1980 seniors who reported having been enrolled in a public community college as of October, 1980. There were 1,776 students who met this selection criterion.

Since collegiate experience was hypothesized to be an important construct in student integration theory, students who reported that they had transferred to a different institution between October 1980 and February 1982 were excluded from the sample. Omitting transfer students resulted in a reduction of 412 students, bringing the sample size to 1,364 students.

Measurement of the Variables

Measures in this study included students’ reports of factual information such as the receipt of student aid and enrollment in institutions of higher education. Other measures were based on students’ perceptions of theoretical constructs such as encouragement, expectation, and academic integration. Listed below are the variables, time of measurement, and their operational definitions. Composite variables were those constructed by the NCES from two or more
questionnaire items. Scale variables were those created for this research from multiple questionnaire items.

GENDER was a composite variable from the base year questionnaire, the base year student identification pages, and the first follow-up questionnaire. When all three sources had missing or contradictory information, a value was assigned by NCES staff based on students’ first names or other available documentation. According to Sebring et al. (1987), the data collected during the second follow-up confirmed that this was a very accurate composite. Female was coded 0 and male was coded 1.

Minority (MINOR) represented a collapsed version of the composite variable, race. It was based on responses from the base year and first follow-up questionnaires. Fetters, Stowe, and Owings (1984) used data submitted by twins to estimate the reliability of selected variables. The estimated reliability coefficient for the senior cohort for race/ethnicity was .89. The six categories of race were: (1) Hispanic, (2) American Indian or Alaskan Native, (3) Asian or Pacific Islander, (4) Black, (5) White, and (6) Other. The other category included students who chose this response and those for whom data were missing from both questionnaires. Minority status, coded 1 for this research, was assigned to those ethnic groups which are under-represented among college graduates, i.e. those who identified their ethnic origin as Hispanic, Black, or American Indian or Alaskan Native. The remaining categories of race, i.e. 3, 5, and 6, were coded 0.

Socioeconomic status (SES), a composite variable, was based on five components from the base year questionnaire: (1) father’s occupation, (2) father’s education, (3) mother’s education, (4) family income, and (5) material possessions in the home. Each component score was standardized and the non-missing values were averaged to derive the SES score. A composite score was computed for every participant who provided data for at least two of the components. Fetters et al. (1984) estimated the validity of the SES composite, using parent data as the standard, to be above .80 for the senior cohort; and the estimated reliability coefficient was .86. A high score
denoted high socioeconomic status.

RURAL represented the size of the community in which the student lived as of the base year, first follow-up, and second follow-up questionnaires. The value of the most recent community type was used when responses varied among the three questionnaires. RURAL was coded 1 for participants from a rural or farming community and all other participants were coded 0.

Homework (HOMEWK) was a measure from the base year questionnaire, item 15, indicative of the average amount of time respondents spent on homework per week. The questionnaire provided seven alternatives for respondents. The seven alternatives were reduced to six levels representing progressively more time spent on homework with the coding as follows:

2 = No homework is assigned or I don't do assigned homework
3 = Less than 1 hour
4 = Between 1 and 3 hours
5 = More than 3 hours but less than 5 hours
6 = Between 5 and 10 hours
7 = More than 10 hours

High school grades (HSGRADES) was the respondent's description of grades earned during high school from base year questionnaire item 7. Originally, the lowest score meant the student had received the highest grades. Coding was reversed so that high scores corresponded with high grades. The following codes were used:

1 = Below D or less than 60
2 = Mostly D's or 60 to 64
3 = Half C's and D's or 65 to 69
4 = Mostly C's or 70 to 74
5 = Half B's and C's or 75 to 79
6 = Mostly B's or 80 to 84
7 = Half A's and B's or 85 to 89
8 = Mostly A's or 90 to 100

Fetters et al. (1984) compared responses to this item with grade point averages calculated by NCES using high school transcripts. Despite variations in the scale used on the questionnaire and the numerical values used for calculated grade averages, the correlation between student data and transcript data was .77.

Tuition (TUIT) was collected on the first follow-up questionnaire from item 43 which asked respondents how much was paid for tuition and fees for the period of fall, 1980 through summer, 1981. Since some students attended only one term during the period of time in question and other students were known to have attended two terms, the amount listed by the student was divided by the number of terms (one or two) that the student attended to derive the value of TUIT.

Encouragement (ENCOUR) was a scale variable defined as the degree of encouragement to attend college. Item 50 of the base year questionnaire asked participants what they perceived several people (father, mother, guidance counselor, teachers, and friends and relatives) thought the participants should do after high school. For each response of "go to college" the respondent was awarded one point. The scores for each item were standardized to ensure that each item contributed equally to the encouragement score. Standardized scores for the five potential sources of encouragement were summed to obtain the score. The reliability coefficient for the scale was .68. A high score on this variable meant the student received encouragement to attend college from several sources.

Expectation (EXPECT) was a scale variable representing the initial goals and commitments of respondents for higher education. Points were assigned for responses to four items from the base year questionnaire as follows:
61G. I will be disappointed if I don't graduate from college.

0 = False  1 = True

65. As things stand now, how far in school do you think you will get?

1 = Less than high school graduation
2 = High school graduation only
3 = Vocational, trade, or business school - less than two years
4 = Vocational, trade, or business school - two years or more
5 = College program - less than two years
6 = College program - two or more years (including two-year degree)
7 = Finish college (four- or five-year degree)
8 = Master's degree or equivalent
9 = Ph.D., M.D., or other advanced professional degree

69. Whatever your plans, do you think you have the ability to complete college?

1 = Definitely not
2 = I doubt it
3 = Not sure
4 = Yes, probably
5 = Yes, definitely

71. What is the one thing that most likely will take the largest share of your time in the year after you leave high school?

0 = Work, trade school, homemaker, military service, or other
1 = Taking academic or vocational courses at a junior or community college or attending a four-year college or university (full-time or part-time)

The scores for each item were standardized then summed to derive the score for expectation. The reliability coefficient for the scale was .67. High scores represented high expectation regarding
educational goals.

College grade point average (COLGPA) was the respondent's report of grades earned in all college course work taken between high school graduation and completion of the first follow-up questionnaire which was about February, 1982. The data were collected from item 41 of the first follow-up questionnaire. Originally, low scores were associated with high grades. Coding was reversed so that high scores corresponded with high grades. The following codes were used:

1 = Below 1.75  
2 = 1.75 to 2.24  
3 = 2.25 to 2.74  
4 = 2.75 to 3.24  
5 = 3.25 to 3.74  
6 = 3.75 to 4.00

Academic integration (AI) was a scale variable constructed from six measures of the respondent's satisfaction with the community college during the last year of enrollment. The data were collected during the first follow-up, about February, 1982. Measured in a five point Likert scale, original codes were reversed so high scores corresponded with high satisfaction. Scores ranged from very satisfied (5) to very dissatisfied (1). The six items asked about perceptions of: faculty, development of work skills, intellectual growth, intellectual life, quality of instruction, and curriculum. According to one study, "concurrent validities between these six HS&B items and the academic integration scales (Pascarella and Terenzini 1980) ranged from .35 to .49" (Cabrera, Stampen, & Hansen, 1990, p. 314). Scores on each item were standardized. Academic integration (AI) was the sum of the standardized scores. The reliability coefficient for this variable was .80.

Student aid (AID), a dichotomous variable, was based upon responses to items 45 and 46 of the first follow-up questionnaire. Students who reported receiving a scholarship, fellowship, grant, benefit, or loan during the period of fall 1980 to summer 1981 were coded 1. Students who
responded that they did not receive aid from any of these sources were coded 0.

GOAL represented the lowest level of education with which the respondent would be satisfied. It was measured during the first follow-up, after respondents had attended college. Values of this variable, item 13, ranged from one to nine and matched the values of base year item 65 which was one of four components of the EXPECT variable.

WORK was derived from a composite variable, JOBSOC80, created by NCES. From responses to items 23 and 24 on the first follow-up questionnaire, the participant's employment status as of October, 1980 was reported on the data file. Four categories were collapsed into two: those who were employed full-time were coded 1 and those employed part-time, unemployed or not in the labor force were coded 0.

Persistence (PERSIST) is the dependent variable, measured in number of terms the participant attended college within two years after high school graduation. Activity state variables from the first follow-up questionnaire (PSESFE81, PSESOC81, PSESFE82) were used to determine whether a participant was enrolled in college as of February 1981, October 1981, and February 1982. For each term of enrollment, the student was assigned one point. Persistence (PERSIST) is the sum of terms enrolled after initial enrollment. Thus, students who did not attend college beyond the term of initial enrollment, fall 1980, had a persistence value of 0 while those who were enrolled in the maximum possible of three terms after initial enrollment had a persistence value of 3.

**Missing Data**

There were missing data for most of the variables. When participants did not respond to a specific item, explicitly refused to respond, provided multiple answers to single response items, or answered an item that was not applicable to the individual, NCES assigned one of several reserved codes. The following reserved codes were recoded to reflect missing values: multiple response, refusal, legitimate nonresponse, don't know, and insufficient data. In the regression analysis, the
pairwise deletion of missing data was used. This resulted in participants being omitted from calculations for only those items for which data were missing.

**Analyses of Data**

The first stage of analysis was to compile descriptive statistics on the variables of interest. Frequencies, percentages, means, and standard deviations were obtained to determine a descriptive profile of the sample. Differences and similarities between student aid recipients and nonrecipients were analyzed using cross-tabulations. Comparisons of each pair of means on intervally scaled variables were tested using student's t statistics.

The model was tested by path analysis, sometimes referenced as causal modeling (Pascarella & Terenzini, 1991). Path analysis is an application of multiple regression useful for testing relationships among variables in a theoretically guided causal system. The technique requires that assumed causal relationships among the variables be specified a priori which is often accomplished by drawing a path diagram with arrows reflecting the hypothesized causal relationships (Wolfe, 1980). The selection and ordering of variables are guided by the theory being tested, the time order of variables, and existing research (Land, 1969). The presumed relationships are then tested via a series of multiple regression analyses which estimate the strength and direction (positive or negative) of relationships among variables. Path analysis is, thus, a means of determining the extent to which the hypothesized relationships among the variables are supported by the data (Pedhazur, 1982). It cannot prove the existence of causal relationships. If the data are supportive of the conceptual model, then the theory from which the model was derived may be a plausible one.

The model tested (see Figure 2) proposed that student persistence was related to thirteen variables. There were seven variables related to the student's pre-entry attributes. These seven variables plus the tuition of the community college a student chose to attend (TUIT) and whether the student worked full-time (WORK) were exogenous variables in the model. As shown in
Figure 2, tuition (TUIT) was proposed as an exogenous variable related to the receipt of student aid; and no relationships between tuition (TUIT) and other variables in the model were proposed. Pedhazur defined an exogenous variable as one "whose variability is assumed to be determined by causes outside the causal model" (1982, p. 581).

Conversely, an endogenous variable is one whose variability is explained by or dependent on the exogenous and other endogenous variables in the model. The seven pre-entry variables were presumed to explain a student's expectation regarding higher education. Collegiate experience was composed of receipt of student aid (AID), academic performance (COLGPA), and academic integration (AI). The ordering of collegiate experience variables suggested that student aid (AID) was influenced by the pre-entry variables, tuition (TUIT), and expectation (EXPECT). Student aid (AID) in turn was anticipated to be related to academic performance (COLGPA). Academic integration (AI) was expected to be explained by academic performance (COLGPA), student aid (AID), expectation (EXPECT), and the seven pre-entry attributes. Students' degree goals (GOAL) and external commitments (WORK) comprise the last stage of the model. Full-time work (WORK) was an exogenous variable thought to be associated with students' degree goal (GOAL) after some collegiate experience. WORK was represented in the model with a potential relationship with degree goal (GOAL) and with persistence (PERSIST). Persistence was hypothesized to be dependent on all exogenous variables, except tuition (TUIT), and on the endogenous variables in the antecedent blocks.
CHAPTER FOUR
RESULTS

The purpose of this chapter is to present the results of analyses of data. The results are presented in seven sections:

1. A description of the demographic characteristics of the sample.
2. A description of the sources of student aid.
3. Comparisons of student aid recipients and nonrecipients.
4. Correlations among the variables in the model of student persistence.
5. Estimation of the model of student persistence.
6. Estimation of a reduced model of student persistence.
7. Effects of the variables.

As mentioned previously, the source of all data for this study was the High School and Beyond, 1980 Senior Cohort (HSB) database. The sample consisted of all students who reported having been enrolled in a two-year public community college as of October, 1980 and who had not transferred to any other college as of the spring of 1982. There were 1,364 students who met the selection criteria. The descriptive statistics are based upon the students for whom data were available.

Description of the Sample

The results of the measurement of the variables appear in Table 1. Cronbach’s coefficient alphas (Cronbach, 1970) are reported for most of the scales created for this research. Since
student aid (AID) was a dichotomous variable and persistence (PERSIST) was the dependent variable, it was inappropriate to calculate coefficient alpha for either of these variables. All of the coefficient alphas were above .50 which was recommended by Nunnally (1967, p. 226) for exploratory research.

Since males were coded one for gender, the mean of .44 indicates that 44 percent of the sample were males. In the total HSB sample, 47 percent were males. Nearly 46 percent of the sample were of minority ethnic origins which are under-represented among college graduates. For comparison, 50.5 percent of the total HSB sample were of minority ethnic origins. Nearly 12 percent of the sample were from rural communities, comparable to the 12.7 percent which were represented in the total HSB sample. Slightly less than 20 percent of the sample worked full-time during the 1980 fall semester, the first semester of college attendance. There was a wide range of tuition reported. The amount reported in Table 1 represents the amount that the student reported paying for the year divided by the number of terms the student attended; therefore, the average amount of tuition, $358, was for the equivalent of one semester.

Sources of Student Aid

Student aid was received during the first year of college by 48 percent of the sample. Students were considered aid recipients if they reported having received a grant, fellowship, scholarship, benefit, or loan during the 1980-81 year. The majority of students reported aid from only one source; however, some students reported aid from as many as four sources. Sources of aid most commonly reported are displayed in Table 2. Of the total sample, 43 percent received gift assistance (grant, fellowship, scholarship, or benefit) and 12.5 percent received a loan. The majority of aid recipients, 74.1 percent, received only gift assistance while 15 percent received both gift and loan assistance.
## Table 1. Measurement of the Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Items used</th>
<th>Coefficient Alpha</th>
<th>Range</th>
<th>Mean</th>
<th>S.D.</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GENDER (Male = 1)</td>
<td>1</td>
<td>--</td>
<td>0</td>
<td>1</td>
<td>.441</td>
<td>.497</td>
</tr>
<tr>
<td>MINOR (Minority = 1)</td>
<td>1</td>
<td>--</td>
<td>0</td>
<td>1</td>
<td>.457</td>
<td>.498</td>
</tr>
<tr>
<td>SES</td>
<td>5</td>
<td>.86</td>
<td>-2.59</td>
<td>2.17</td>
<td>-.162</td>
<td>.745</td>
</tr>
<tr>
<td>RURAL (Rural = 1)</td>
<td>1</td>
<td>--</td>
<td>0</td>
<td>1</td>
<td>.117</td>
<td>.321</td>
</tr>
<tr>
<td>HOMEWK</td>
<td>1</td>
<td>--</td>
<td>2</td>
<td>7</td>
<td>4.583</td>
<td>1.235</td>
</tr>
<tr>
<td>HSGRADES</td>
<td>1</td>
<td>--</td>
<td>2</td>
<td>8</td>
<td>5.841</td>
<td>1.239</td>
</tr>
<tr>
<td>TUIT</td>
<td>1</td>
<td>--</td>
<td>0</td>
<td>3250</td>
<td>357.577</td>
<td>450.554</td>
</tr>
<tr>
<td>ENCOEUR</td>
<td>5</td>
<td>.68</td>
<td>-7.63</td>
<td>3.50</td>
<td>.029</td>
<td>3.323</td>
</tr>
<tr>
<td>EXPECT</td>
<td>4</td>
<td>.67</td>
<td>-11.37</td>
<td>3.50</td>
<td>.090</td>
<td>2.845</td>
</tr>
<tr>
<td>COLGPA</td>
<td>1</td>
<td>--</td>
<td>1</td>
<td>6</td>
<td>3.534</td>
<td>1.250</td>
</tr>
<tr>
<td>A1</td>
<td>6</td>
<td>.80</td>
<td>-19.54</td>
<td>7.20</td>
<td>-.008</td>
<td>4.223</td>
</tr>
<tr>
<td>AID (Aided = 1)</td>
<td>2</td>
<td>*</td>
<td>0</td>
<td>1</td>
<td>.484</td>
<td>.500</td>
</tr>
<tr>
<td>GOAL</td>
<td>1</td>
<td>--</td>
<td>1</td>
<td>9</td>
<td>5.721</td>
<td>1.675</td>
</tr>
<tr>
<td>WORK (Full time = 1)</td>
<td>1</td>
<td>--</td>
<td>0</td>
<td>1</td>
<td>.197</td>
<td>.398</td>
</tr>
<tr>
<td>PERSIST</td>
<td>3</td>
<td>*</td>
<td>0</td>
<td>3</td>
<td>2.390</td>
<td>1.007</td>
</tr>
</tbody>
</table>

*Coefficient Alpha not computed due to the nature of the variable.
Of the 626 students who received aid, 589 reported the amount of gift and/or loan assistance received. One student recounted receiving a total of $6 (the lowest amount) and two students reported aid in the amount of $6,000 (the highest amount). The mean amount of aid received from both grant and loan sources for the 1980-81 year was $1,183.

Comparisons of Student Aid Recipients with Nonrecipients

Characteristics of the sample are presented through a series of cross-tabulations. In addition to describing the sample, the cross-tabulations are useful for identifying the similarities and differences between students who received aid and those who did not. On the base-year questionnaire, students were asked the degree of importance of selected characteristics in their choice of a college. Three of those characteristics were college expenses, the availability of financial aid, and the ability to live at home while attending college. The level of importance which students assigned to these factors is displayed in Table 3.

Students who subsequently reported receiving aid attached greater importance to both the cost of college and the availability of financial aid than those students who did not receive aid. College expenses was a very important factor for 48.7 percent of the aid recipients compared to 39.1 percent of those who did not receive aid ($\chi^2 = 14.80, \ p < .01$). During the senior year of high school, more than one-half of the students who subsequently received aid reported that financial aid would be a very important consideration in their college choice, while less than one third of the nonrecipients considered financial aid as a very important factor ($\chi^2 = 88.04, \ p < .01$). There was not a significant association between the importance of being able to live at home and receipt of financial aid. As expected the opportunity to live at home was somewhat or very important for most, 73.1 percent, of the sample. For comparison being able to live at home while attending college was somewhat or very important for only 51.3 percent of the total HSB sample.
Table 2. Sources of Student Aid

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent of Recipients</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Grant, Scholarship, Benefit</td>
<td>558</td>
<td>89.1</td>
<td>43.2</td>
</tr>
<tr>
<td>BEOG</td>
<td>406</td>
<td>64.9</td>
<td>31.4</td>
</tr>
<tr>
<td>SEOG</td>
<td>58</td>
<td>9.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Social Security</td>
<td>76</td>
<td>12.1</td>
<td>5.9</td>
</tr>
<tr>
<td>College Scholarship</td>
<td>62</td>
<td>9.9</td>
<td>4.8</td>
</tr>
<tr>
<td>Private Scholarship</td>
<td>62</td>
<td>9.9</td>
<td>4.8</td>
</tr>
<tr>
<td>Any Loan</td>
<td>162</td>
<td>25.9</td>
<td>12.5</td>
</tr>
<tr>
<td>NDSL</td>
<td>42</td>
<td>6.3</td>
<td>3.2</td>
</tr>
<tr>
<td>GSL</td>
<td>55</td>
<td>8.8</td>
<td>4.3</td>
</tr>
<tr>
<td>State Loan</td>
<td>17</td>
<td>2.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Unduplicated Recipients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant and Loan</td>
<td>94</td>
<td>15.0</td>
<td>7.3</td>
</tr>
<tr>
<td>Grant Only</td>
<td>464</td>
<td>74.1</td>
<td>35.9</td>
</tr>
<tr>
<td>Loan Only</td>
<td>68</td>
<td>10.9</td>
<td>5.2</td>
</tr>
<tr>
<td>Total Unduplicated</td>
<td>626</td>
<td>100</td>
<td>48.4</td>
</tr>
</tbody>
</table>
Table 3. Importance of Selected Factors in College Choice

<table>
<thead>
<tr>
<th>Factor</th>
<th>No Aid</th>
<th></th>
<th>Received Aid</th>
<th></th>
<th>Row Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Col. %</td>
<td>No.</td>
<td>Col. %</td>
<td>No.</td>
<td>Row %</td>
</tr>
<tr>
<td>College expenses*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not important</td>
<td>75</td>
<td>13.4</td>
<td>38</td>
<td>7.6</td>
<td>113</td>
<td>10.7</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>265</td>
<td>47.5</td>
<td>218</td>
<td>43.7</td>
<td>483</td>
<td>45.7</td>
</tr>
<tr>
<td>Very important</td>
<td>218</td>
<td>39.1</td>
<td>243</td>
<td>48.7</td>
<td>461</td>
<td>43.6</td>
</tr>
<tr>
<td>Financial aid*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not important</td>
<td>155</td>
<td>28.0</td>
<td>45</td>
<td>9.1</td>
<td>200</td>
<td>19.0</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>224</td>
<td>40.4</td>
<td>173</td>
<td>34.8</td>
<td>397</td>
<td>37.8</td>
</tr>
<tr>
<td>Very important</td>
<td>175</td>
<td>31.6</td>
<td>279</td>
<td>56.1</td>
<td>454</td>
<td>43.2</td>
</tr>
<tr>
<td>Live at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not important</td>
<td>137</td>
<td>24.6</td>
<td>146</td>
<td>29.5</td>
<td>283</td>
<td>26.9</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>213</td>
<td>38.2</td>
<td>169</td>
<td>34.1</td>
<td>382</td>
<td>36.3</td>
</tr>
<tr>
<td>Very important</td>
<td>207</td>
<td>37.2</td>
<td>180</td>
<td>36.4</td>
<td>387</td>
<td>36.8</td>
</tr>
</tbody>
</table>

* Significant association with receipt of aid
Table 4 represents the joint frequency distribution of students according to demographic characteristics and student aid status. There were 71 students for whom student aid status was unknown; therefore, the total number of students represented is less than the total sample. A comparison of the demographic characteristics of students for whom aid status was unknown revealed that these students did not vary substantially from students whose status was reported. Of the total sample, 15.5 were black students; however, Table 4 reflects that 15.2 percent of students whose aid status was known were black. White students accounted for 49.9 percent of the total sample; but, due to fewer missing values on aid status, 50.2 percent of the total represented in Table 4 are white students. Males, 44.1 percent of the total sample, had more missing values for student aid status, which explains why only 43.7 percent of the total in Table 4 are males.

As noted previously, the variable minority (MINOR) was created to identify those students from ethnic backgrounds which are under-represented among college graduates: Hispanic, Black, or American Indian or Alaskan Native. Hispanic and black students are disproportionately over-represented among aid recipients while white students are under-represented among aid recipients ($\chi^2 = 50.21, p < .01$). The association between gender and receipt of aid was greater than would be expected by chance ($\chi^2 = 12.52, p < .01$). Being from a rural community was not significantly associated with financial aid status.

A 2 x 2 contingency table on the variable WORK, defined as full-time work versus not working full-time, revealed that student aid recipients were disproportionately under-represented among students who worked full-time ($\chi^2 = 8.64, df = 1, p < .01$). Contrary to expectations, the majority of students (60.7 percent) who were working full-time were full-time students during the same term. Among financial aid recipients, 78.1 percent of those working full-time were enrolled as full-time students at the same time.

Two of the variables of interest, socioeconomic status (SES) and tuition (TUIT), were
measured on a continuous scale while others had numerous categories. When variables were measured on at least an interval scale, the mean score of students who did not receive aid was compared to the mean score of students who received aid using the student's t statistic. The results of these comparisons appear in Table 5. The F test was used to test the assumption of equal variances, and the F obtained was greater than .05 for all but one variable, TUIT. Therefore, the t values listed in Table 5 for variables other than TUIT were based on the pooled variance estimate. The separate variance estimate was used to determine the t value for TUIT.

Given the need based criteria under which most aid is awarded, it is not surprising that the recipients of aid had a significantly lower mean socioeconomic status than did the nonrecipient group. It should be noted that socioeconomic status was a composite variable composed of the parents' educational levels, father's occupation, family income, and material possessions in the household. There was a significant difference in the mean amount of tuition (TUIT) that aid recipients reported having paid and the amount paid by those who did not receive aid. Student aid recipients paid nearly $200 more in tuition per term.

Although the two groups differed significantly in terms of the average grades earned in high school, they did not differ in the amount of time they reported spending on homework. Both groups reported spending about three hours per week on homework. Like other variables in this study, high school grades were reported by the students. The mean high school grade average student aid recipients reported was 6.026, corresponding to mostly B grades or an 80 to 84 average; and the mean average reported by students who did not receive aid was 5.7, roughly interpreted as mostly B's with some C's. The college grades of the two groups were similar, also. Both reported earning college grades of 3.5 which translates to an average of about 2.5 on a 4.0 scale.

Aid recipients had higher expectations regarding higher education than did nonrecipients; however, there was no difference in degree goals, GOAL, when the first follow-up measure was
taken. Persistence was defined as the number of terms a student reenrolled within two years of entering a community college. The mean terms of reenrollment for the student aid group was 2.489 while the mean for the group that did not receive aid was 2.316, a difference significant at the .01 level.

When students were queried on the base year questionnaire what each of five individuals or groups thought the respondent should do after high school, one of the options was to attend college. The sum of these five questions resulted in the encouragement (ENCOUR) variable. Although there was no difference in the mean encouragement score of the students who received student aid compared to the group of nonrecipients, there were differences in the sources of encouragement reported by the two groups. Table 6 reflects the numbers of students who reported that each of the five sources thought they should go to college.

The most prevalent sources of encouragement for both groups of students were parents. A slightly higher percentage of the nonrecipient group received parental encouragement, but the difference was not significant. Significant differences were observed in the numbers of students who reported that school personnel encouraged them to attend college. Slightly over half, 52.5 percent, of the students who did not receive aid reported that their guidance counselors thought they should attend college compared with 64.6 percent of the student aid recipients ($x^2 = 18.40$, $p < .01$). Teachers were a source of encouragement for only 52.5 percent of the nonrecipient group and for 58.6 percent of the student aid recipients ($x^2 = 4.55$, $p < .05$). About 65 percent of the sample thought friends and relatives wanted them to attend college with no significant difference observed between the two groups.

While there was no difference in the mean academic integration (AI) score of student aid recipients and nonrecipients, there were notable differences in their perceptions on two of the six items used to derive the AI score. On the first follow-up questionnaire, students were asked how satisfied as a whole they were with selected facets of the college they last attended. As shown in
Table 4. Ethnicity, Gender, Community Type, and Work Status by Receipt of Student Aid

<table>
<thead>
<tr>
<th>Category</th>
<th>No Aid</th>
<th></th>
<th>Received Aid</th>
<th></th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Ethnicity*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>176</td>
<td>26.4</td>
<td>194</td>
<td>31.0</td>
<td>370</td>
</tr>
<tr>
<td>Native American</td>
<td>10</td>
<td>1.5</td>
<td>9</td>
<td>1.4</td>
<td>19</td>
</tr>
<tr>
<td>Black</td>
<td>66</td>
<td>9.9</td>
<td>131</td>
<td>20.9</td>
<td>197</td>
</tr>
<tr>
<td>Asian</td>
<td>43</td>
<td>6.4</td>
<td>14</td>
<td>2.2</td>
<td>57</td>
</tr>
<tr>
<td>White</td>
<td>371</td>
<td>55.6</td>
<td>278</td>
<td>44.4</td>
<td>649</td>
</tr>
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<td>Other</td>
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<td>626</td>
<td>100</td>
<td>1293</td>
</tr>
<tr>
<td>Work Status*</td>
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<td>622</td>
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* Significant association with receipt of aid
Table 5. Comparisons of Nonrecipients and Recipients on Selected Variables

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<th>t Value</th>
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<td>S. D.</td>
<td>N</td>
<td>Mean</td>
<td>S. D.</td>
<td>N</td>
<td></td>
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<td>.722</td>
<td>602</td>
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<td>4.666</td>
<td>1.204</td>
<td>611</td>
<td>-1.91</td>
<td></td>
</tr>
<tr>
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<td>1.206</td>
<td>643</td>
<td>6.026</td>
<td>1.249</td>
<td>610</td>
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<td></td>
</tr>
<tr>
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<td>372.180</td>
<td>641</td>
<td>459.490</td>
<td>512.230</td>
<td>604</td>
<td>-7.50**</td>
<td></td>
</tr>
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<td>EN COUR</td>
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<td>610</td>
<td>.225</td>
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<td>564</td>
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<tr>
<td>EXPECT</td>
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<td>2.763</td>
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<tr>
<td>COL GPA</td>
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<td>634</td>
<td>3.533</td>
<td>1.29</td>
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<tr>
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<td>4.167</td>
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<td>.068</td>
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<td>614</td>
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<td>5.783</td>
<td>1.618</td>
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<tr>
<td>PERSIST</td>
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<td>665</td>
<td>2.489</td>
<td>.903</td>
<td>624</td>
<td>-3.11**</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01
Table 6, 9.5 percent of the aid recipients expressed dissatisfaction with the ability, knowledge and personal qualities of most teachers. Only 5.7 percent of the students who did not receive aid communicated dissatisfaction. More of the group that did not receive aid indicated a neutral or no opinion response to the item regarding teachers than did the group that received aid. The association between receipt of aid and satisfaction with most teachers was significant ($\chi^2 = 10.47$, $p < .05$).

There was a significant association, also, between receipt of aid and satisfaction with the intellectual life at the last college attended ($\chi^2 = 10.79$, $p < .05$). One-third of the sample were neutral or had no opinion regarding the intellectual environment; however, fewer student aid recipients indicated a neutral response. The majority of both groups were satisfied with the intellectual life, 51.7 percent of the nonrecipients and 58.5 percent of the aid recipients.

Overall the majority of the sample was satisfied with each of the six college factors which were combined for the measure of academic integration (AI). A higher percentage of the sample expressed satisfaction on each of the items than did the overall HSB sample. Like the total HSB sample, the community college students were most satisfied with their intellectual growth; 83.6 percent were somewhat or very satisfied compared with 51.7 percent of the total HSB sample. The rank order of the five other variables were also the same for the community college students as for the total HSB sample. The five items, the proportion of the sample who were satisfied, and listed in parentheses the percentage of the total HSB sample who were satisfied were:

1. most teachers, 82.5 percent (50.6%);
2. instructional quality, 80.3 percent (47.7%);
3. development of work skills, 75.9 percent (47.1%);
4. course curriculum, 75.1 percent (46.2%); and
5. intellectual life, 55.0 percent (38.0%).
Table 6. Sources of College Encouragement and Satisfaction at Last College Attended

<table>
<thead>
<tr>
<th>Category</th>
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<th>Row Total</th>
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<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
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<td>Father</td>
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<td>1035</td>
<td>83.9</td>
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<td>58.6</td>
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<td>399</td>
<td>66.8</td>
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<td><strong>Satisfaction with Intellectual Life</strong></td>
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* Significant association with receipt of aid
The analyses through cross-tabulations and t tests represent a narrow perspective of the relationship between student aid and selected characteristics of the sample. While these comparisons are helpful, it is necessary to consider the collective and separate contributions of student aid as well as other variables in the conceptual model to answer the research questions posed by this study.

Correlations among the Variables

The zero-order correlations among the variables in the model are presented in Table 7. The correlation coefficients represent the total association between each pair of variables. Correlations were computed using pairwise deletion for missing values so as to retain as many of the original sample as was possible. The minimum number of cases included in the correlations was 1,168. Means, standard deviations, and the number of cases represented for each of the variables are reported in Table 1. Eleven of the 14 independent or predictor variables were significantly ($p < .05$) associated with the dependent variable, persistence (PERSIST). Values of the correlations ranged from .001 (between high school grades and rural community being the lowest) to .470 (between encouragement and expectation, being the highest). Given that the highest bivariate correlation was less than .70 (Kerlinger and Pedhazur, 1973, p. 94), multicollinearity among the independent variables in the model did not appear to be a problem.

Estimation of the Model

Since some persistence research had found interaction effects based on the gender or ethnicity of the student, three potential interactions were tested. These were between minority (MINOR) and academic integration (AI), between minority (MINOR) and expectation (EXPECT), and between GENDER and academic integration (AI). The $R^2$ from the model with direct effects was compared to results from each of the analyses with interaction effects to
Table 7. Correlation Coefficients among the Variables in the Model of Student Persistence

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<th>RURAL</th>
<th>HOMEWK</th>
<th>HSGRADES</th>
<th>TUIT</th>
<th>ENCOUR</th>
<th>EXPECT</th>
<th>COLGPA</th>
<th>AI</th>
<th>AID</th>
<th>GOAL</th>
<th>WORK</th>
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<td>.010</td>
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<td>-.040</td>
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<td>-.071*</td>
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<td>.007</td>
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<td>.178**</td>
<td>.086**</td>
<td>.418**</td>
<td>-.141**</td>
<td>1.000</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01
determine if the interaction terms resulted in a significant increase in $R^2$. The interaction terms did not produce a significant difference in $R^2$; therefore, one model was tested.

To test the model, it was necessary to solve six regression equations. Each endogenous variable was regressed on all causally related variables which preceded the dependent variable in the conceptual model (see Figure 2). Thus, the dependent variable persistence was regressed on the 13 independent variables which were hypothesized to be related to persistence. Next, the subsequent goal was regressed on academic integration, college grade point average, student aid, expectation, and the eight exogenous variables (work and the seven pre-entry attributes). Then academic integration was regressed on college grade point average, student aid, expectation, and the seven pre-entry attributes. Likewise, college grade point average and expectation were regressed on preceding variables. Since tuition had been identified in prior research as an important determinant of student aid, tuition was added as an exogenous variable in the regression equation involving student aid.

The six regression equations were estimated via the computer program GEMINI (Wolfe and Ethington, 1984). The program required the minimum number of cases used, a correlation matrix (see Table 7), means, standard deviations (see Table 1), and a few commands specifying the equations and the order of the variables. Standardized regression, or path, coefficients are reported in Figure 3 and Table 8 to facilitate comparisons across variables. Each coefficient represents the number of standard deviations the dependent variable is expected to change when the independent variable increases by one standard deviation, while the remaining variables are held constant (Pedhazur, 1982, p. 247). The path coefficient is referred to as the direct effect of an independent variable taken as a cause on a variable taken as an effect (Kerlinger & Pedhazur, 1973, p. 310).
Figure 3 illustrates the significant paths (p < .05) resulting from the six regression equations. The absence of lines emanating from student aid (AID) graphically depicts that AID did not have a significant direct effect on any of the subsequent variables in the model. Path coefficients for the model of student persistence are reported in Table 8. Recognizing that path coefficients are sample specific, the metric coefficients and standard errors resulting from the estimation of the model are shown in Appendix B. When comparisons between samples are being drawn, metric coefficients are preferred. Metric coefficients tend to be more stable despite differences in the variances and the covariances of the samples from which the coefficients were derived, while path coefficients may change markedly from one sample to another depending upon the variances and covariances of the variables.

The $R^2$ shown at the bottom of Table 8 represents the total amount of variance in the respective dependent variables accounted for by the independent variables. The 13 variables in the model explained 23 percent of the variance in persistence. This compares favorably with other multi-institutional studies using Tinto's model such as Munro (1981) 15%, Pascarella and Chapman (1983) 17%, and St. John et al. (1991) 16%. Tinto warned against having unrealistic expectations in explaining behavior as complex as student persistence. "Given the limits of current theory, we should not be surprised or chagrined when our models fail to account for a very large proportion of the statistical variance in measured dropout behaviors" (Tinto, 1982, p. 688-689).

The addition of the student aid variable recommended by St. John et al. (1991) did not prove to be a significant addition to the model. When other variables were held constant, student aid was not an important variable in explaining persistence. This is consistent with the results of Peng and Fetters (1978) analysis of two-year college students but was unexpected given the
findings of St. John et al. and speculation by Murdock (1987) that student aid appeared to have a more positive impact on the persistence of two-year college students.

Of the five variables that had statistically significant direct effects on persistence, degree goal had the greatest effect which was consistent with Tinto’s theory and with the findings of Munro (1981) and Pascarella and Chapman (1983). In descending order, the other important variables were academic integration, work, expectation, and encouragement. In terms of student integration theory, the directions of relationships were as expected. Full-time work (WORK) had a negative direct effect while other significant associations were positive. According to student integration theory, work was predicted to be associated with degree goal (GOAL) but not directly associated with persistence. The significant, negative effect of full-time employment was consistent with results reported by Astin (1975), Bers and Smith (1991), Brooks-Leonard (1991), and Hunter and Sheldon (1980).

Although Tinto’s theory predicts that the effects of academic integration will be mediated by subsequent goal commitment, others also have found a significant direct association between academic integration and persistence (Cabrera et al., 1992; Grosset, 1991; Pascarella et al., 1983; Pascarella et al., 1986). The importance of initial expectations regarding college has been supported by both institutional and national studies (e.g. Bers & Smith, 1991; St. John et al., 1991; Voorhees, 1987).

The only pre-entry attribute that yielded a significant direct effect was encouragement. Although Nora (1987) found that encouragement had a significant total effect, it was largely transmitted through initial goals. None of the literature reviewed found a significant direct effect for encouragement; however, relatively few of the studies considered encouragement.

When degree goal was regressed on antecedent variables, the 12 independent variables accounted for 17.8 percent of the variance in goal. The direct effect of expectation regarding
college, measured during the senior year of high school, was more than twice as great as any other independent variable. Considering theoretical expectations and empirical evidence, a surprising finding was that collegiate experiences and external commitments were not strongly associated with degree goal. While the direct effect of academic integration was significant, it was relatively minor in comparison with the direct effects of pre-entry attributes of gender, high school grades, socioeconomic status, and minority ethnicity. Pre-entry attributes associated with higher goals were being male, having high socioeconomic status, and being a minority student.

Only three variables had significant direct effects on academic integration. Since only eight percent of the variation in academic integration was accounted for by the variables in the model, 92 percent of the variance remained unexplained. College grade average exerted the strongest direct effect on academic integration. Being a minority student and spending more time on homework were associated with increased academic integration. Three variables had significant direct effects on college grade average: high school grades, encouragement, and homework. The standardized coefficient for high school grades was more than four times greater than the coefficients for either of the other two variables.

Variables in the model, including tuition, accounted for 15.5 percent of the variance in receipt of student aid. As expected socioeconomic status had the largest direct effect, .2578, with low socioeconomic status being associated with receipt of aid. This finding concurs with the results reported by others who have analyzed the determinants of student aid (Augenblick & Hyde, 1979; Bishop, 1989; Caplan, 1980; Grubb & Tuma, 1991; Jensen, 1984; Merisotis, 1987; Venti, 1983). The second most important variable was tuition, confirming the conclusions of Breneman and Nelson (1981), Caplan, and Venti. Other factors associated with receipt of aid were having above average high school grades, being a member of an under-represented minority group, having higher expectation regarding college, and being female. Others had observed that above average
high school grades and minority group membership were positively associated with receipt of student aid (Capián; Venti). Although significant, the path coefficient associated with gender was comparatively small.

Higher expectation regarding college was significantly associated with six of the seven pre-entry attributes. Encouragement to attend college had the largest direct effect, .3658. Nora (1987) and Nora et al. (1990) found a similar association between encouragement from others and college aspirations. In descending order, other important factors were having above average high school grades, being from a family with high socioeconomic status, living in a non-rural community, and spending more time on homework. Minority students reported higher expectations, but the relative size of the direct effect was small. Pre-entry attributes accounted for 31.6 percent of the variation in collegiate expectations.

**Reduced Path Model**

As recommended by Land (1969, p. 35), variables with small path coefficients (path coefficient < .055) were deleted from the model, and the model was reestimated. The reduced path model had an $R^2$ of .2274. There was not a significant reduction in the amount of variance explained by the reduced path model as compared to the full model, $R^2 = .2347$. The estimation of a reduced path model produces a more parsimonious model and removes from the discussion of total effects those variables which have substantively no importance. Path coefficients from the reduced path model on degree goal (GOAL) and persistence (PERSIST) are shown in Figure 4.

Student aid, not shown in Figure 4, did not have significant direct effects on any of the subsequent variables in the full model. Other variables without significant direct effects on either GOAL or PERSIST were: rural, homework, and college grade point average. All five of the variables significantly associated with persistence in the full model were significant in the regression of persistence using the reduced model.
Figure 3. Results for the Model of Student Persistence
Table 8. Path Coefficients (Standardized) for the Model of Student Persistence

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>PERSIST</th>
<th>GOAL</th>
<th>AI</th>
<th>COLGPA</th>
<th>AID</th>
<th>EXPECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOAL</td>
<td>.3377**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WORK</td>
<td>-.1085**</td>
<td>-.0244</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI</td>
<td>.1252**</td>
<td>.0780**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLGPA</td>
<td>-.0011</td>
<td>-.0429</td>
<td>.2599**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AID</td>
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<td>.0204</td>
<td>.0098</td>
<td>-.0468</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPECT</td>
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<td>.2438**</td>
<td>-.0186</td>
<td>-.0313</td>
<td>.0897**</td>
<td></td>
</tr>
<tr>
<td>GENDER</td>
<td>.0250</td>
<td>.1371**</td>
<td>-.0245</td>
<td>.0050</td>
<td>-.0596*</td>
<td>.0420</td>
</tr>
<tr>
<td>RURAL</td>
<td>-.0039</td>
<td>-.0277</td>
<td>.0074</td>
<td>.0473</td>
<td>.0119</td>
<td>-.1104**</td>
</tr>
<tr>
<td>SES</td>
<td>-.0014</td>
<td>.1044**</td>
<td>.0434</td>
<td>.0242</td>
<td>-.2577**</td>
<td>.1788**</td>
</tr>
<tr>
<td>MINOR</td>
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<td>.0962**</td>
<td>.0880**</td>
<td>-.0428</td>
<td>.1002**</td>
<td>.0588*</td>
</tr>
<tr>
<td>HSGRADES</td>
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<td>.0003</td>
<td>.4121**</td>
<td>.1166**</td>
<td>.1789**</td>
</tr>
<tr>
<td>HOMEWK</td>
<td>.0505</td>
<td>.0426</td>
<td>.0714*</td>
<td>.0732**</td>
<td>.0072</td>
<td>.1201**</td>
</tr>
<tr>
<td>ENCOUR</td>
<td>.0620*</td>
<td>.0767*</td>
<td>.0274</td>
<td>-.0933**</td>
<td>.0069</td>
<td>.3658**</td>
</tr>
<tr>
<td>TUIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.2042**</td>
</tr>
</tbody>
</table>

R² = .2347 .1781 .0825 .1849 .1553 .3160

*p < .05; ** p < .01
Figure 4. Results for the Reduced Model of Student Persistence
Effects of the Variables

Just as the direct effect of an independent variable on a dependent variable was defined as the part of the effect of the independent variable that is not mediated, or transmitted, by other variables, the indirect effect refers to the part of the effect that is transmitted by other variables. The indirect effects of the variables on each of the variables taken as dependent variables in the reduced model are presented in Table 9. Since college grade average (COLGPA) did not have significant direct effects on variables other than academic integration, it was not included as a dependent variable in Table 9. All of the predictor variables had significant indirect effects on persistence. The only indirect effect that was not significant in the reduced model was from minority (MINOR) to student aid (AID). Metric coefficients and standard errors for the reduced model are shown in Appendix B.

The total effect is the sum of the direct effect and all indirect effects (Wolfe, 1980). The total effect of each independent variable retained in the reduced model on persistence is displayed in Table 10. Degree goal (GOAL) with a total effect of .3468 was the most important variable in explaining persistence. Since there were no intervening variables between GOAL and persistence (PERSIST), the total effect of GOAL was the direct effect. The second most important factor in terms of total effects, expectation (EXPECT) had a total effect coefficient of .1912. The indirect effect of EXPECT was transmitted through GOAL and was nearly as large as the direct effect. The third most important factor, encouragement (ENCOUR) had a total effect coefficient of .1666 resulting largely from the indirect effects which were transmitted through EXPECT and GOAL. Academic integration (AI) which had the largest direct effect had the fourth largest total effect. Full-time work (WORK) represented the third most important variable in terms of direct effects on persistence and the fifth largest total effect.
Given the importance of degree goal (GOAL), Table 11 shows the decomposition of total effects on GOAL. Of the seven variables with significant direct effects, five were background variables. Comparison of the total effects and the rank order of variables in Table 11 reveals that five of the six largest total effects were from background characteristics. Consistent with the findings of Munro (1981), Pascarella et al. (1983) and Stage (1988), initial college expectation had the largest total effect which was, also, the largest direct effect. The second largest direct effect on goal was from gender, indicating that men had higher goals after two years in a community college than did women. It is noteworthy that gender was not an important variable in the prediction of expectation; therefore, there were no indirect effects from gender to goal.

The indirect effects associated with the background characteristics were transmitted through expectation (EXPECT). Student integration theory predicted that academic integration would be associated with GOAL. Although the direct effect of academic integration was significant, it was comparatively small. The least important variable among those retained in the reduced model in explaining degree goal was college grade point average (COLGPA). Of the three collegiate experience variables included in the original conceptual model, only academic integration had a significant relationship to degree goal.

Summary of Results

When tested on a sample of community college students, the conceptual model of student persistence accounted for 23.5 percent of the variance in persistence. Although St. John et al. (1991) had determined that student aid contributed to the explanation of persistence among a national sample of two- and four-year college students, student aid was not a significant factor for this sample of community college students. Deletion of the student aid variable and other variables with small path coefficients did not result in a significant reduction in the coefficient of determination ($R^2 = .2274$).
Table 9. Indirect Effects** for Reduced Model of Student Persistence

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>PERSIST</th>
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<th>AI</th>
<th>AID</th>
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<tr>
<td>AI</td>
<td>.0250*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLGPA</td>
<td>.0413*</td>
<td>.0188*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPECT</td>
<td>.0897*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GENDER</td>
<td>.0451*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RURAL</td>
<td>-.0210*</td>
<td>-.0284*</td>
<td>-.0101*</td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>.0705*</td>
<td>.0476*</td>
<td>.0169*</td>
<td></td>
</tr>
<tr>
<td>MINOR</td>
<td>.0599*</td>
<td>.0204*</td>
<td>.0053</td>
<td></td>
</tr>
<tr>
<td>HSGRADES</td>
<td>.0832*</td>
<td>.0524*</td>
<td>.1069*</td>
<td>.0159*</td>
</tr>
<tr>
<td>HOMEWK</td>
<td>.0376*</td>
<td>.0371*</td>
<td>.0172*</td>
<td>.0107*</td>
</tr>
<tr>
<td>ENCOUR</td>
<td>.0951*</td>
<td>.0923*</td>
<td>-.0290*</td>
<td>.0336*</td>
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</table>

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

** Standardized coefficients
### Table 10. Total Effects* on Persistence

<table>
<thead>
<tr>
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<th>Direct Effects</th>
<th>Indirect Effects</th>
<th>Rank</th>
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</thead>
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<td>.3468</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Full-time Work</td>
<td>-.1122</td>
<td>-.1122</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Academic Integration</td>
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<td>.1336</td>
<td>.0250</td>
<td>4</td>
</tr>
<tr>
<td>College GPA</td>
<td>.0413</td>
<td>-</td>
<td>.0413</td>
<td>10</td>
</tr>
<tr>
<td>Student Aid</td>
<td>.0000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Expectation</td>
<td>.1912</td>
<td>.1014</td>
<td>.0897</td>
<td>2</td>
</tr>
<tr>
<td>Gender</td>
<td>.6451</td>
<td>-</td>
<td>.9451</td>
<td>9</td>
</tr>
<tr>
<td>Rural Hometown</td>
<td>-.0210</td>
<td>-</td>
<td>-.0210</td>
<td>12</td>
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<tr>
<td>Socioeconomic Status</td>
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<td>-</td>
<td>.0705</td>
<td>7</td>
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<tr>
<td>Minority</td>
<td>.0599</td>
<td>-</td>
<td>.0599</td>
<td>8</td>
</tr>
<tr>
<td>High School Grades</td>
<td>.0832</td>
<td>-</td>
<td>.0832</td>
<td>6</td>
</tr>
<tr>
<td>Homework</td>
<td>.0376</td>
<td>-</td>
<td>.0376</td>
<td>11</td>
</tr>
<tr>
<td>Encouragement</td>
<td>.1666</td>
<td>.0715</td>
<td>.0951</td>
<td>3</td>
</tr>
</tbody>
</table>

*Standardized Coefficients
Table 11. Total Effects* on Goal

<table>
<thead>
<tr>
<th>From:</th>
<th>Total Effects</th>
<th>Direct Effects</th>
<th>Indirect Effects</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time Work</td>
<td>.0000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Academic Integration</td>
<td>.0721</td>
<td>.0721</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>College GPA</td>
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<td>-</td>
<td>.0188</td>
<td>10</td>
</tr>
<tr>
<td>Student Aid</td>
<td>.0000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Expectation</td>
<td>.2588</td>
<td>.2588</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Gender</td>
<td>.1300</td>
<td>.1300</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Rural Hometown</td>
<td>-.0284</td>
<td>-</td>
<td>-.0284</td>
<td>9</td>
</tr>
<tr>
<td>Socioeconomic Status</td>
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<td>.1019</td>
<td>.0476</td>
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<td>Minority</td>
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<td>6</td>
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<td>High School Grades</td>
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<td>.0957</td>
<td>.0524</td>
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<tr>
<td>Homework</td>
<td>.0371</td>
<td>-</td>
<td>.0571</td>
<td>8</td>
</tr>
<tr>
<td>Encouragement</td>
<td>.1787</td>
<td>.0864</td>
<td>.0923</td>
<td>2</td>
</tr>
</tbody>
</table>

*Standardized Coefficients
Path analysis was used to examine the direct and indirect effects of the variables on persistence. The variables with the greatest direct effect on persistence were, in descending order: degree goal, academic integration, work, expectation, and encouragement. Several variables had significant indirect effects on persistence. When the total effects of the variables were identified, degree goal remained the most important one in explaining persistence. Other variables with total effect coefficients greater than .05 were, in descending order: expectation, encouragement, academic integration, work, high school grades, socioeconomic status, and minority ethnicity. The only collegiate experiences variable which was important in explaining persistence was academic integration. The influence of pre-entry attributes, those innate and acquired traits with which students enter colleges, was transmitted largely through other variables, primarily expectation and degree goal. One pre-entry attribute, encouragement, had a significant direct effect on persistence.

Contrary to reported statistics on the low percentage of community college students receiving student aid (Grubb & Tuma, 1991; Stampen, 1983), 48 percent of this sample received student aid. Consistent with Stampen's finding, students received aid primarily in the form of grants. Only five percent received a loan as the only source of student aid. Student aid recipients differed significantly in several respects from those who did not receive aid. Student aid recipients were more likely to consider college cost and availability of student aid important in the choice of a college.

Cross-tabulations between student aid status and other variables of interest revealed several significant differences between students who received aid and those who did not. Minority students and women were disproportionately over-represented among the student aid recipients. Aid recipients were less likely to have worked full-time during the first term in college than were students who did not receive aid. The mean high school grade average reported by student aid recipients was significantly higher than that reported by the nonrecipients, but there was no difference in the mean college grade average reported by the two groups. There was a significant
difference in the mean persistence (PERSIST) score of the two groups. PERSIST was defined as the number of terms a student attended a community college after the 1980 fall term. The mean PERSIST score for student aid recipients was 2.489 compared to 2.316 for the nonrecipient group, a difference significant at the .01 level. This significant difference in persistence was based upon bivariate comparison of the two groups without controls for differences between the groups.

The best predictors of whether students received aid were, in descending order of importance: socioeconomic status, the amount of tuition paid, high school grades, ethnicity, expectation regarding college, and gender. Students were more likely to receive aid if they had low socioeconomic status, were from an ethnic minority, and were female. Higher expectation regarding college was associated with the receipt of aid. The nine variables which were regressed on receipt of aid explained 15.5 percent of the variance in whether a student received aid. This means that 84.5 percent of the variance was not accounted for by the nine variables.
CHAPTER FIVE

DISCUSSION, IMPLICATIONS, AND SUGGESTIONS

This chapter begins with a brief summary of the purpose and methods of the study. Discussion of the conclusions drawn from the results of data analyses follows. The final section is devoted to implications and suggestions for future research.

Summary

The primary purpose of this study was to test a conceptual model for assessing the effects of student aid on community college student persistence. The study was guided by a model developed by St. John et al. (1991) for examining the effects of student aid on persistence. The model was grounded in Tinto's (1987) theory of student integration which had been tested primarily with samples of four-year college students. Data for the study were drawn from the base year and first follow-up questionnaires of High School and Beyond, 1980 Senior Cohort, a longitudinal research project. The 1,364 students in the sample had enrolled in various public community colleges during the fall of 1980 and had not transferred to another institution as of the spring of 1982. Persistence was defined as the number of terms of continued enrollment in the community college from the fall of 1980 through the spring of 1982.

To determine whether there were significant differences between student aid recipients and students who did not receive aid, a series of cross-tabulations and t tests were employed. Path analysis was used to test the model of student persistence. The model proposed that student persistence was related to thirteen variables. There were seven pre-entry attributes which were
presumed to be related to students' expectations regarding college. The seven pre-entry attributes and expectation were antecedent variables to the students' collegiate experiences, i.e. student aid, college grades, and academic integration. The last two variables in the model were full-time work and degree goal which was defined as the lowest level of education with which the student would be satisfied. The variables were arranged in a recursive model (see Figure 2). In addition to the pre-entry attributes and expectation, a tuition variable was included in the regression of student aid.

Discussion

Research Hypothesis One

The first null hypothesis was that there was no significant difference in the pre-entry attributes of student aid recipients and students who did not receive aid. Bivariate and regression analyses revealed significant differences in the two groups; therefore, the hypothesis was rejected. Student aid recipients differed significantly from nonrecipients in the following ways:

1. They had significantly lower socioeconomic status.
2. They were more likely to be female.
3. They were more likely to be from ethnic backgrounds other than Asian or white.
4. They reported earning significantly higher grades in high school.
5. They considered college costs and the availability of aid more important factors in their choice of a college.
6. They had significantly higher expectations regarding college.
7. They were less likely to work full-time during the first term in college.
8. They paid higher tuition than did students who did not receive aid.
9. They were more persistent.

Nearly two-thirds of the aid recipients reported receiving Basic Education Opportunity
Grants (BEOG), the eligibility for which was determined by financial need and the institution's cost of attendance (Fenske & Huff, 1983). Therefore, it was not surprising to find socioeconomic status and tuition to be of major importance in the analysis of which students received aid.

Net of the effects of pre-entry attributes, tuition, and expectation, the third most important factor in the regression of student aid was high school grades. Since some of the aid recipients reported having received a scholarship, it is likely that high school grade average was among the criteria on which the scholarship award was based. A second and more compelling explanation for the relationship between high school grades and student aid is that students with higher grades generally may have been more proficient at following the somewhat complicated aid application procedures. More of the student aid recipients reported that guidance counselors thought they should attend college, suggesting that they, also, may have received more assistance from counselors in completing aid application procedures. Student aid recipients may have been more determined to seek out all possible sources of financial support since they had higher expectations regarding college.

Students from ethnic minorities which are under-represented among college graduates were more likely to receive aid than were white and Asian students with the same socioeconomic status, tuition costs, high school grades, expectation, etc. This suggests that some of the aid may have been awarded to fulfill affirmative action goals.

**Research Hypothesis Two**

The second null hypothesis was that there was no relationship between pre-entry attributes of students and their persistence. Through path analysis it was shown that all of the pre-entry attributes in the model had significant indirect effects on persistence, and encouragement to attend college had both direct and indirect effects. As a result, the second null hypothesis was rejected. The effects of pre-entry attributes were transmitted through expectation and degree goal. Encouragement was the third most important variable in the explanation of persistence. Students
who believed that others thought they should attend college had higher expectations regarding college, higher degree goals, and were more persistent that other similar students who do not have multiple sources of encouragement.

While encouragement was considered a pre-entry attribute, it is likely that the expectations of significant others regarding college were reinforced during students' collegiate attendance particularly since many of these students probably lived at home while in college. Parents, high school personnel, friends, and relatives were presumably more accessible to them than would have been the case for students attending more distant colleges. Another factor supporting this conclusion was that encouragement was a more important factor for persistence than were any of the collegiate experience variables.

Most of the tests of student integration theory did not include an encouragement variable, nor was it included in the model proposed by St. John et al. (1991) for assessing the effects of student aid on persistence. The few studies that considered encouragement determined that more encouragement to attend college was related to higher initial expectation regarding college but was not directly related to persistence (Cabrera et al., 1992; Nora, 1987; Nora et al., 1990). In other words, the effect of encouragement on persistence was an indirect one transmitted by initial expectation. The finding that encouragement was positively and directly associated with persistence was, therefore, unexpected.

Research Hypothesis Three

The third null hypothesis was that there would be no relationship between collegiate experiences of students and their persistence. Consistent with the theory of student integration, academic integration had a significant direct effect on goal. In addition, a significant path was identified between academic integration and persistence meaning that academic integration had both direct and indirect effects on persistence. Students who perceived a greater degree of integration into the academic environment of the community college had higher degree goals and
higher persistence than did students with lower academic integration scores, all other things being equal. This finding was substantiated by most of the empirical evidence related to the student integration model of persistence.

Although others had found that college grades were significantly related to persistence (e.g. Anderson, 1987; Donovan, 1984; Grosset, 1991), this study found that college grades had a relatively small, indirect effect on persistence. Above average college grades were associated with a higher degree of academic integration, and higher academic integration was associated with persistence.

Full-time work was a variable representing external commitments consistent with Tinto's (1987) adaptation of student integration theory. While positive experiences in the collegiate environment were theorized to have a positive association with degree goals, external commitments such as work were expected to have a counterbalancing, negative influence on degree goals. This study found that work was not directly associated with degree goals; however, there was a negative relationship between working full-time and persistence.

The third null hypothesis was rejected. Academic integration and full-time work were significantly related (one positive and the other negative) to persistence.

**Research Hypothesis Four**

The fourth null hypothesis was that there was no significant difference in the persistence rate of student aid recipients and those who did not receive aid when other factors in the model were held constant. The recent research by St. John et al. (1991) and meta-analysis by Murdock (1987) suggested that student aid would contribute to the explanation of persistence among community college students. In a bivariate comparison, this study found that student aid recipients had a higher rate of persistence than nonrecipients. However, when the effects of other variables in the model were statistically controlled, there was no significant difference between the persistence of student aid recipients and students who did not receive aid. When the student aid variable was
removed from the model and the reduced model was tested on the data, the reduced model was as effective in accounting for the variance in persistence behavior of community college students as was the full model with the student aid variable. The data failed to support rejection of the fourth hypothesis.

One potential explanation for the finding that student aid does not contribute to the explanation of persistence centers on the differences between aid recipients and the other students. Earlier in this section it was noted that the pre-entry attributes of student aid recipients and nonrecipients were substantially different. The relationships among the variables explored through path analysis determined that several of the pre-entry attributes were related to persistence. So although aid recipients exhibited a higher rate of persistence, it was the pre-existing differences between student aid recipients and other students that contributed to their persistence rather than the receipt of aid.

While this study was guided by the recent research of St. John et al. (1991), results of the studies differed. One explanation is the difference in the samples used. Students from two- and four-year colleges were included in the study by St. John et al. A second difference is that this researcher included variables from the students’ external environments which they did not. Although St. John et al. included initial intentions and commitments, herein called expectation, their measure of the construct was a single item regarding postsecondary degree aspirations. Tinto’s (1987) definition of initial intentions and commitments as a multi-dimensional construct including not only the level of one’s goal but the person’s assessment of the likelihood of attaining particular goals and the motivation to achieve it. The purpose of using multiple indicators of expectation in this research was to capture as much of the essence of Tinto’s definition as was possible. The difference in the definition of expectations, the inclusion of external environment factors, and differences in the samples may account for differences in the results of this study and the one by St. John et al. Noting that their analyses were able to predict a limited amount of the
variability in persistence, St. John et al. reported imputed $R^2$s of 12.2 percent and 15.9 percent from their analyses of persistence between the first and second years and the second and third years, respectively. The addition of selected variables for the present research was effective in that 22.7 percent of the variance in persistence was accounted for by the 12 variables in the reduced model of student persistence.

Implications

One of the purposes of persistence research is to identify ways in which institutions are impacting students so that administrators may address conditions that could reduce institutional attrition. The following implications emanate from the findings of this research. The implications are only applicable to community colleges since the sample was composed of community college students. Although student aid was not a significant predictor of persistence, one should not conclude that student aid is expendable. Student aid recipients considered the cost of college and the availability of student aid more important in their college choice than did nonrecipients. It is likely that the receipt of aid enabled many of the recipients to attend community colleges. Once students were in college, student aid provided neither an advantage nor a disadvantage.

Students' degree goal was the best predictor of persistence. Community colleges should help students clarify degree goals and make sure the student has access to information about the full spectrum of educational opportunities for which the student is qualified. Academic and career counseling will not necessarily result in increased degree goals, but it may inspire some students to heighten their goals. Institutions should be particularly cognizant of the effects they can have on students' degree goals, particularly female students. This study determined that women had lower goals two years after entering community colleges than did men; however, there was no difference in the initial expectation between men and women.

Students with a higher degree of academic integration were more likely to persist than were
those who had lower levels of academic integration. Both formal and informal interactions between faculty and students should be encouraged. Academic advising is one source of interaction outside the classroom that may contribute to retention. Recognition of faculty members who are effective advisors and those who are particularly adept in the classroom may motivate other faculty members to become more involved with students.

Community colleges should strengthen support systems for students lacking support and encouragement from others. Students from single parent homes, those who are first generation college students, or those who made the decision to attend college late may be in need of additional support. A peer and/or faculty mentor program would be one means of providing additional encouragement to students.

Suggestions for Future Research

Additional research regarding the relationship between student aid and persistence is warranted. Within a theoretical model of persistence like the one used for this study, comparisons of the persistence rates of students at varying types of institutions could be drawn. Going beyond just the level (two or four year), the researcher could explore similarities and differences between public and private institutions and among categories of institutions, such as research universities, comprehensive universities, and liberal arts colleges. The review of literature suggested that the amount of aid provided may be an important factor in persistence, particularly among minority students (Astin, 1975; Leslie & Brinkman, 1988; Nora, 1990).

The role of student aid in students' decisions to transfer is another area for investigation. Mallette and Cabrera (1991) identified differences between the factors associated with transfer decisions versus departure decisions; however, they did not consider the role of student aid. Institutions that provide scholarships from institutional funds would have an interest in the degree to which institutional aid contributes to students' decisions to persist versus transfer.
Further investigation into the relationship between encouragement for college and persistence is recommended with other samples including students from two- and four-year colleges. Are there sources of encouragement that are more important to students' persistence, and are there particular students that would benefit most from additional encouragement?

Few investigations were identified which analyzed the relationship between persistence and external commitments. Although the present study considered external commitments associated with full-time work, family obligations may be related also to altered goal commitment and departure from higher education. External commitments may be a more important factor given the increasing population of non-traditional students attending college.
REFERENCES


APPENDIX A

Questions from the Base Year and First Follow-up Surveys

High School and Beyond, 1980 Senior Cohort
7. Which of the following best describes your grades so far in high school? (MARK ONE)

- Mostly A (a numerical average of 90-100)
- About half A and half B (85-89)
- Mostly B (80-84)
- About half B and half C (75-79)
- Mostly C (70-74)
- About half C and half D (65-69)
- Mostly D (60-64)
- Mostly below D (below 60)

15. Approximately what is the average amount of time you spend on homework a week? (MARK ONE)

- No homework is ever assigned
- I have homework, but I don't do it
- Less than 1 hour a week
- Between 1 and 3 hours a week
- More than 3 hours, less than 5 hours a week
- Between 5 and 10 hours a week
- More than 10 hours a week

18. What is your race? (MARK ONE)

- Black
- White
- American Indian or Alaskan Native
- Asian or Pacific Islander
- Other (WRITE IN)
42. What was the highest level of education your mother (stepmother or female guardian) completed? (MARK ONE)

- Do not live with mother (stepmother or female guardian) ........................................... O
- Less than high school graduation .................................................................................. O
- High school graduation only ......................................................................................... O
- Vocational, trade or business school after high school ....................................................
  - Less than two years ........................................................................................................ O
  - Two years or more ........................................................................................................ O
  - Less than two years of college .................................................................................... O
  - Two or more years of college (including two-year degree) ........................................... O
  - Finished college (four- or five-year degree) ................................................................ O
  - Master's degree or equivalent .................................................................................... O
  - Ph.D., M.D., or other advanced professional degree .................................................. O
- Don't know ..................................................................................................................... O

50. What do the following people think you ought to do after high school? (MARK ONE OVAL FOR EACH LINE)

<table>
<thead>
<tr>
<th></th>
<th>Go to college</th>
<th>Get a full-time job</th>
<th>Enter a trade school or apprenticeship</th>
<th>Enter military service</th>
<th>They don't care</th>
<th>I don't know</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Your father</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Your mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. A guidance counselor</td>
<td></td>
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<td></td>
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<tr>
<td>d. Teachers</td>
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<td></td>
<td></td>
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<tr>
<td>e. Friends or relatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
  - about your own age |               |                     |                                        |                        |                |              |                |
61. Are the following statements about yourself true or false? (MARK ONE OVAL FOR EACH LINE)

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
</table>
   a. I have been in serious trouble with the law ........... O ...... O...
   b. I am overweight ............................................. O ...... O...
   c. Others think of me as physically unattractive ............ O ...... O...
   d. I am popular with other students in my class ............ O ...... O...
   e. I like to work hard in school ................................ O ...... O...
   f. I enjoy working for pay ........................................ O ...... O...
   g. I will be disappointed if I don't graduate from college .... O ...... O...

65. As things stand now, how far in school do you think you will get? (MARK ONE)

   - Less than high school graduation ................................................. O
   - High school graduation only ......................................................... O
   - Vocational, trade, or business school after high school
     - Less than two years ................................................................. O
     - Two years or more ................................................................. O
     - Less than two years of college .................................................. O
     - Two or more years of college (including two-year degree) ............... O
     - Finish college (four- or five-year degree) ................................... O
     - Master's degree or equivalent ................................................... O
     - Ph.D., M.D., or other advanced professional degree ....................... O

69. Whatever your plans, do you think you have the ability to complete college? (MARK ONE)

   Yes, definitely ................................................................. O
   Yes, probably ................................................................. O
   Not sure ................................................................. O
   I doubt it ................................................................. O
   Definitely not ................................................................. O
71. What is the one thing that most likely will take the largest share of your time in the year after you leave high school? (MARK ONE)

- Working full time .................................................................
- Entering an apprenticeship or on-the-job training program ...........
- Going into regular military service (or service academy) ...........
- Being a full-time homemaker ...............................................
- Taking vocational or technical courses at a trade or business school full time or part time ...........................................
- Taking academic courses at a junior or community college full time or part time .........................................................
- Taking technical or vocational subjects at a junior or community college full time or part time ...........................................
- Attending a four-year college or university full time or part time ..........................................................
- Working part time, but not attending school or college ..........................................................
- Other (travel, take a break, no plans) ........................................

83. Sex:
(MARK ONE)

- Male ..................
- Female ............

88. What is your race? (MARK ONE)

- Black .................................................................
- White .................................................................
- American Indian or Alaskan Native ....................................
- Asian or Pacific Islander ...........................................
- Other .................................................................
101. This time families are divided into seven groups according to how much money they make in a year. Mark the oval for the group which comes closest to the amount of money your family makes in a year. (MARK ONE)

- $6,999 or less ........................................ 0
- $7,000 to $11,999 ........................................ 0
- $12,000 to $15,999 ........................................ 0
- $16,000 to $19,999 ........................................ 0
- $20,000 to $24,999 ........................................ 0
- $25,000 to $37,999 ........................................ 0
- $38,000 or more ........................................ 0

102. Does your family own or rent the house or apartment in which you now live? (MARK ONE)

- Own ......................................................... 0
- Rent ......................................................... 0
- Other arrangement ........................................ 0

103. How many rooms are there in your home? Count only the rooms your family lives in. Count the kitchen (if separate) but not bathrooms. (MARK ONE)

- 1 2 3 4 5 6 7 8 9 10 or more

104. Which of the following do you have in your home? (MARK ONE OVAL FOR EACH LINE)

- Have    Do not have
  a. A specific place for study ........ 0 .... 0
  b. A daily newspaper ..................... 0 .... 0
  c. Encyclopedia or other reference books ........ 0 .... 0
  d. Typewriter ..................................... 0 .... 0
  e. Electric dishwasher ...................... 0 .... 0
  f. Two or more cars or trucks that run ........ 0 .... 0
  g. More than 50 books ..................... 0 .... 0
  h. A room of your own ....................... 0 .... 0
  i. Pocket calculator ....................... 0 .... 0
4. Which of the following best describes the place where you lived in the first week of February 1982? (MARK ONE)

- In a rural or farming community ................................................................. 0
- In a small city or town of fewer than 50,000 people that is not a suburb of a larger place ................................................................. 0
- In a medium-sized city (50,000-100,000 people) .............................................. 0
- In a suburb of a medium-sized city ............................................................... 0
- In a large city (100,000-500,000 people) .......................................................... 0
- In a suburb of a large city .............................................................................. 0
- In a very large city (over 500,000 people) ....................................................... 0
- In a suburb of a very large city ...................................................................... 0
- A military base or station ............................................................................. 0

13. What is the lowest level of education you would be satisfied with? (MARK ONE)

- Less than high school graduation .................................................................. 0
- High school graduation only .......................................................................... 0

Vocational, trade, or business school after high school

- Vocational, trade, or business school after high school
  - Less than two years .................................................................................... 0
  - Two years or more ..................................................................................... 0

College program

- College program
  - Less than two years of college .................................................................... 0
  - Two or more years of college (including two-year degree) ......................... 0
  - Finished college (four- or five-year degree) .............................................. 0
  - Master's degree or equivalent .................................................................... 0
  - Ph.D., M.D., or other advanced professional degree .................................. 0

Don't know ........................................................................................................ 0
22. Between the time you left high school and the end of February 1982 have you held a full-time or part-time job of any kind? (MARK ONE)

   Yes _____________________________________________ ○
   No _____________________________________________ ○ (SKIP TO Q. 29)

23. Which months did you work (full- or part-time) or serve in the military since you left high school? (MARK ALL THAT APPLY)

   1980       1981       1982
   June       ○       January       ○       July       ○       January       ○
   July       ○       February       ○       August       ○       February       ○
   August     ○       March        ○       September      ○       ○
   September  ○       April        ○       October       ○       ○
   October    ○       May         ○       November      ○       ○
   November   ○       June        ○       December      ○       ○
   December   ○       ○           ○           ○

24. Next we would like information about all of the jobs you have had since you left high school. We would also like to know about any periods of time you were looking for work between jobs that you held.

   IMPORTANT

   ... Please start with the first job you held after high school, even if it started while you were still in school. Answer questions 1 through 12 for that job in Column A, (pages 5 and 10). Then go on to the next job you held and answer the questions about that job in Column B, and so on.

   ... BE SURE TO INCLUDE YOUR CURRENT JOB

   ... If you have been in MILITARY service, please consider that as one job.

   ... If you had MORE THAN ONE JOB AT A TIME, please put them in separate columns.

   ... If you have had TOO MANY JOBS TO FIT, please make sure to put your current or most recent job in Column E even if that means leaving out some jobs.

   ... If you WOULD LIKE HELP WITH THESE QUESTIONS, please call us collect at area (312) 753-1488.

What is today's date? (MARK OVALS FOR MONTH AND DAY)

<table>
<thead>
<tr>
<th>Month</th>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>February</td>
<td>1 thru 7</td>
</tr>
<tr>
<td>March</td>
<td>8 thru 14</td>
</tr>
<tr>
<td>April</td>
<td>15 thru 21</td>
</tr>
<tr>
<td>May</td>
<td>22 thru 31</td>
</tr>
<tr>
<td>June</td>
<td></td>
</tr>
</tbody>
</table>
### Column A

#### 1st Job After High School

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>What kind of job or occupation</td>
<td>Office Use Only</td>
</tr>
<tr>
<td>Did or do you have? (For example, salesperson, waitress, secretary, etc.)</td>
<td>(WRITE IN)</td>
</tr>
<tr>
<td>What kind of business or industry was this job in? (For example, retail shoe store, restaurant, etc.)</td>
<td>(WRITE IN)</td>
</tr>
<tr>
<td>What were your main activities or duties on this job? (For example, selling shoes, waiting on tables, etc.)</td>
<td>(WRITE IN)</td>
</tr>
<tr>
<td>In this job were you ... (MARK APPROPRIATE CATEGORY)</td>
<td>An employee of a PRIVATE COMPANY</td>
</tr>
<tr>
<td></td>
<td>A GOVERNMENT employee (federal, state, local)</td>
</tr>
<tr>
<td></td>
<td>Self-employed in your OWN business</td>
</tr>
<tr>
<td></td>
<td>Working WITHOUT PAY in family business or farm</td>
</tr>
<tr>
<td>What did you start working at this job? (MARK OVALS FOR MONTH and YEAR)</td>
<td>Month</td>
</tr>
<tr>
<td></td>
<td>Jan.</td>
</tr>
<tr>
<td></td>
<td>Feb.</td>
</tr>
<tr>
<td></td>
<td>March</td>
</tr>
<tr>
<td></td>
<td>April</td>
</tr>
<tr>
<td></td>
<td>May</td>
</tr>
<tr>
<td></td>
<td>June</td>
</tr>
<tr>
<td></td>
<td>July</td>
</tr>
<tr>
<td>When did you leave this job? (MARK OVALS FOR MONTH and YEAR)</td>
<td>Month</td>
</tr>
<tr>
<td></td>
<td>Jan.</td>
</tr>
<tr>
<td></td>
<td>March</td>
</tr>
<tr>
<td>Still have this job</td>
<td></td>
</tr>
<tr>
<td>What was your starting salary on this job? (WRITE IN)</td>
<td>(MARK ONE)</td>
</tr>
<tr>
<td></td>
<td>hourly</td>
</tr>
<tr>
<td></td>
<td>weekly</td>
</tr>
</tbody>
</table>

**PLEASE READ INSTRUCTIONS**

**GO TO COLUMN A, PAGE 10.**

**COLUMN A**

<table>
<thead>
<tr>
<th>1ST JOB AFTER HIGH SCHOOL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(MARK ONE)</strong></td>
</tr>
<tr>
<td>○ hourly</td>
</tr>
<tr>
<td>$__________  ○ weekly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Office Use Only</th>
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</thead>
<tbody>
<tr>
<td>××××××××××××××</td>
</tr>
<tr>
<td>××××××××××××××</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9) About how many hours a week</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ did or do you usually work in this job? (WRITE IN)</td>
</tr>
<tr>
<td>_______ hours per week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Office Use Only</th>
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<tbody>
<tr>
<td>××××××××××××××</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10) How did you find this job?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MARK MOST IMPORTANT CATEGORY)</td>
</tr>
<tr>
<td>School employment or placement service 0</td>
</tr>
<tr>
<td>Public employment service 0</td>
</tr>
<tr>
<td>Private employment agency 0</td>
</tr>
<tr>
<td>Newspaper advertisement 0</td>
</tr>
<tr>
<td>Checked with employer directly 0</td>
</tr>
<tr>
<td>Through a relative 0</td>
</tr>
<tr>
<td>Through a friend 0</td>
</tr>
<tr>
<td>Civil Service application 0</td>
</tr>
<tr>
<td>Other (WRITE IN) 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11) Why did you leave this job?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MARK APPROPRIATE CATEGORY)</td>
</tr>
<tr>
<td>Lost job (fired, laid off, job ended) 0</td>
</tr>
<tr>
<td>Left job to return to school 0</td>
</tr>
<tr>
<td>Quit because job, hours, or pay, etc. unsatisfactory 0</td>
</tr>
<tr>
<td>Still have this job 0</td>
</tr>
<tr>
<td>Other (WRITE IN) 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12) Were you without a job AND looking for work right after you left this job? (MARK APPROPRIATE CATEGORY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(IF YOU STILL HAVE THIS JOB, MARK THIS OVAL--)</td>
</tr>
<tr>
<td>Yes (FOR HOW MANY WEEKS? WRITE IN) ______ weeks 0</td>
</tr>
<tr>
<td>No 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Office Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>××××××××××××××</td>
</tr>
</tbody>
</table>

**PLEASE READ INSTRUCTIONS**—TURN BACK TO PAGE 8 AND CONTINUE WITH YOUR SECOND JOB.
IF YOU HAD NO OTHER JOB, GO TO Q. 25 ON PAGE 12.
31. Between the time you left high school and the end of February 1982, have you enrolled in or did you take classes at any school such as college or university, graduate or professional school, service academy or school, business school, trade school, technical institute, vocational school, community college, and so forth? (Do not include Armed Forces training programs.) (MARK ONE)

Yes__________________________________________ (GO TO Q. 32)

No____________________________________________ (SKIP TO Q. 30)

32. Which months were you enrolled in or taking classes in any school between the time you left high school and the end of February 1982? (MARK ALL THAT APPLY)

<table>
<thead>
<tr>
<th>1980</th>
<th>1981</th>
<th>1982</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>January</td>
<td>July</td>
</tr>
<tr>
<td>July</td>
<td>February</td>
<td>August</td>
</tr>
<tr>
<td>August</td>
<td>March</td>
<td>September</td>
</tr>
<tr>
<td>September</td>
<td>April</td>
<td>October</td>
</tr>
<tr>
<td>October</td>
<td>May</td>
<td>November</td>
</tr>
<tr>
<td>November</td>
<td>June</td>
<td>December</td>
</tr>
<tr>
<td>December</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

33. Next we would like information about all of the schools you have gone to since you left high school. Please start with the first school you went to after high school. Answer questions A-K for that school in the first column (pages 18 and 18), then answer questions A-K for the second school in the next column, and so on. (BE SURE TO INCLUDE YOUR CURRENT SCHOOL.)

If you attended two schools at the same time, please put them in separate columns.

BEGIN ON NEXT PAGE.
<table>
<thead>
<tr>
<th>COLUMN 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ST SCHOOL AFTER HIGH SCHOOL</td>
</tr>
</tbody>
</table>

| A) What is the exact NAME and LOCATION of the school? (WRITE IN) |
| School name: |
| Address: |
| City: |
| State: |

| B) What kind of school is this? (MARK ONE) |
| Vocational, trade, business, or other career training school |
| Junior or community college (2-year) |
| College or university (4 years or more) |
| Other (DESCRIBE) |

| C) When did you START attending this school? (MARK OVALS FOR MONTH and YEAR) |
| Month |
| Jan. | May | Sept. |
| March | July | Nov. |
| Yes |
| º 1980 |
| º 1981 |
| º 1982 |

| D) When did you LEAVE this school? (MARK OVALS FOR MONTH and YEAR) |
| Am still attending this school, have NOT left |
| Left in: |
| Month |
| Jan. | May | Sept. |
| March | July | Nov. |
| Year |
| º 1980 |
| º 1981 |
| º 1982 |
40. With regard to your education and training during the last year you were in school, how satisfied as a whole were you with the following? (MARK ONE OVAL FOR EACH LINE)

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied</th>
<th>Somewhat satisfied</th>
<th>Neutral or no opinion</th>
<th>Somewhat dissatisfied</th>
<th>Very dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The ability, knowledge,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and personal qualities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of most teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. The social life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Development of my work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. My intellectual growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Counseling or job</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>placement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. The buildings, library,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>equipment, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Cultural activities, music,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>art, drama, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. The intellectual life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of the school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Course curriculum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. The quality of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Sports and recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. The financial cost of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attending</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. The prestige of the</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

41. Estimate how well you have done in all of your course work or programs during the period since you left high school (MARK ONE)

- Mostly A (3.75-4.00 grade point average)  
- About half A and half B (3.25-3.74 grade point average)  
- Mostly B (2.75-3.24 grade point average)  
- About half B and half C (2.25-2.74 grade point average)  
- Mostly C (1.75-2.24 grade point average)  
- About half C and half D (1.25-1.74 grade point average)  
- Mostly D or below (less than 1.25)  
- Have not taken any courses for which grades were given.
The following questions ask about your school finances for the two time periods of (a) Fall 1980 through Summer 1981, and (b) Fall 1981 through Summer 1982. Please make sure you answer each question for both periods. If you are unsure about the actual amounts for a particular item, give your best estimate. Please estimate all of your school-related expenses (such as tuition, fees, books, supplies, transportation to classes, etc.) through the end of next summer.

43. Considering the time periods of Fall 1980 through Summer 1981, and Fall 1981 through Summer 1982, what is your estimate of how much it cost you (or will cost you) for tuition and fees to go to school, regardless of who paid? Estimate the amounts and record them below. Do not include costs after Summer 1982. Enter a zero, "0", where you had no expenses. (WRITE IN AMOUNTS)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$________________</td>
<td>$________________</td>
<td>$________________</td>
<td>$________________</td>
</tr>
</tbody>
</table>

45. Did you receive (or will you receive) any kind of scholarship, fellowship grant, or benefits (not a loan) to go to school during these time periods? (MARK ALL THAT APPLY)

a. Yes, Fall 1980-Summer 1981
b. Yes, Fall 1981-Summer 1982
c. No

A. What kind(s) of scholarship, fellowship, grant, or benefit (not a loan) did you or will you receive? (MARK ALL THAT APPLY IN EACH COLUMN)

<table>
<thead>
<tr>
<th>(1) Fall 1980- Summer 1981</th>
<th>(2) Fall 1981- Summer 1982</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Basic Educational Opportunity Grant (BEOG) or Pell Grant</td>
<td>o 0</td>
</tr>
<tr>
<td>b. Supplemental Educational Opportunity Grant</td>
<td>o 0</td>
</tr>
<tr>
<td>c. ROTC Scholarship</td>
<td>o 0</td>
</tr>
<tr>
<td>d. Social Security Benefits for Children of Retired, Disabled or Deceased Parents</td>
<td>o 0</td>
</tr>
<tr>
<td>e. Nursing scholarship program</td>
<td>o 0</td>
</tr>
<tr>
<td>f. Veterans Administration Survivors' and Dependents Educational Assistance Program</td>
<td>o 0</td>
</tr>
<tr>
<td>g. Veterans' Educational Assistance Program (VEAP) or new GI Bill</td>
<td>o 0</td>
</tr>
<tr>
<td>h. State Scholarship Program</td>
<td>o 0</td>
</tr>
<tr>
<td>i. College or University Scholarship</td>
<td>o 0</td>
</tr>
<tr>
<td>j. Scholarships from Private Organizations</td>
<td>o 0</td>
</tr>
<tr>
<td>k. Division of Vocational Rehabilitation Educational Benefits</td>
<td>o 0</td>
</tr>
<tr>
<td>l. Financial assistance for which you do not know the source</td>
<td>o 0</td>
</tr>
<tr>
<td>m. Other scholarship or grant</td>
<td>(WRITE IN) 0 0</td>
</tr>
</tbody>
</table>
B. Estimate the total dollar value of the amount you received and will receive from scholarships, fellowships, grants, or benefits (not a loan) during each period. Enter a zero, "0", where you received no such funds. (WRITE IN AMOUNTS)

<table>
<thead>
<tr>
<th>Office Use Only</th>
<th>Office Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dollar Value</td>
<td>Total Dollar Value</td>
</tr>
</tbody>
</table>

46. Considering the same time periods, did you or will you receive a loan to go to school? (MARK ALL THAT APPLY)

a. Yes, Fall 1980-Summer 1981 — ○ (ANSWER A-C)
b. Yes, Fall 1981-Summer 1982 — ○ (ANSWER A-C)
c. No — ○ (GO TO Q. 47)

A. From which of the following sources did you or will you receive a loan to go to school? (MARK ALL THAT APPLY IN EACH COLUMN)

<table>
<thead>
<tr>
<th>Source</th>
<th>Fall 1980-Summer 1981</th>
<th>Fall 1981-Summer 1982</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. National Direct Student Loan</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>b. Federal Guaranteed Student Loan Program</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>c. Nursing Student Loan Program</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>d. State Student Loan Program</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>e. College or University Loan Program</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>f. Regular bank loan</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>g. Parents, other relatives or friends</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>h. Loan for which you do not know the exact source</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>i. Other loan (WRITE IN)</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

B. Estimate the total dollar value of the amounts you received or will receive as loans to go to school during each period. Enter a zero, "0", where you received no loans. (WRITE IN AMOUNTS)

<table>
<thead>
<tr>
<th>Office Use Only</th>
<th>Office Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dollar Value</td>
<td>Total Dollar Value</td>
</tr>
</tbody>
</table>

C. If you were offered a program which would reduce the amount of money which you owe on a Federal Loan for education assistance, would you enlist in the Armed Forces?

Yes — ○ (ANSWER D)
Maybe — ○ (ANSWER D)
No — ○ (GO TO Q. 47)
APPENDIX B
Appendix B-1. Direct Effects** and Standard Errors*** for the Model of Student Persistence

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>PERSIST</th>
<th>GOAL</th>
<th>AI</th>
<th>COLGPA</th>
<th>AID</th>
<th>EXPECT</th>
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</thead>
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<td>GOAL</td>
<td>.2030*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.0171)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>WORK</td>
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<td>-.1027</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>(.1132)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI</td>
<td>.0298*</td>
<td>.0309*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>(.0111)</td>
<td></td>
<td></td>
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<tr>
<td>COLGPA</td>
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<td>-.0575</td>
<td>.8730*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(.0237)</td>
<td>(.0408)</td>
<td>(.1054)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AID</td>
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<td>.0682</td>
<td>.0829</td>
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<td></td>
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<tr>
<td>(.0553)</td>
<td>(.0953)</td>
<td>(.2531)</td>
<td>(.0705)</td>
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<tr>
<td>EXPECT</td>
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<td>.1436*</td>
<td>-.0275</td>
<td>-.0138</td>
<td>.0158*</td>
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</tr>
<tr>
<td>(.0113)</td>
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<td>(.0141)</td>
<td>(.0057)</td>
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<td></td>
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<tr>
<td>GENDER</td>
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<td>-.2082</td>
<td>.0125</td>
<td>-.0600</td>
<td>.2404</td>
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<tr>
<td>(.0544)</td>
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<td>(.2464)</td>
<td>(.0687)</td>
<td>(.0281)</td>
<td>(.1428)</td>
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<td>-.1444</td>
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<td>(.0828)</td>
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<td>(.0431)</td>
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<tr>
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<td>.2463</td>
<td>.0405</td>
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<td>.6827*</td>
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<tr>
<td>(.0404)</td>
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<td>(.1841)</td>
<td>(.0513)</td>
<td>(.0203)</td>
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<td>.7458*</td>
<td>-.1075</td>
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<td>.3358*</td>
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<tr>
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<td>(.0992)</td>
<td>(.2632)</td>
<td>(.0733)</td>
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<td></td>
</tr>
<tr>
<td>HSGRADES</td>
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<td>.1421*</td>
<td>.0010</td>
<td>.4157*</td>
<td>.0470*</td>
<td>.4107*</td>
</tr>
<tr>
<td>(.0251)</td>
<td>(.0430)</td>
<td>(.1164)</td>
<td>(.0295)</td>
<td>(.0119)</td>
<td>(.0597)</td>
<td></td>
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<tr>
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<td>.0578</td>
<td>.2442*</td>
<td>.0741*</td>
<td>.0029</td>
<td>.2766*</td>
</tr>
<tr>
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<td>(.1020)</td>
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<tr>
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<td>.0387</td>
<td>.0349</td>
<td>-.0351*</td>
<td>.0010</td>
<td>.3131*</td>
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<tr>
<td>TUIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.0002*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.0000)</td>
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</tr>
</tbody>
</table>

* Metric coefficient is at least twice its standard error

** Metric (unstandardized) coefficients

*** Standard error is in parenthesis
Appendix B-2. Indirect Effects** and Standard Errors*** for Reduced Model of Student Persistence

<table>
<thead>
<tr>
<th>Independent Variable</th>
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<th>AI</th>
<th>AID</th>
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</tr>
<tr>
<td>COLGPA</td>
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<td>(.0254)</td>
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</tr>
<tr>
<td></td>
<td>(.0071)</td>
<td>(.0067)</td>
<td>(.0100)</td>
<td>(.0017)</td>
</tr>
</tbody>
</table>

* Metric coefficient is at least twice its standard error

** Metric (unstandardized) coefficients

*** Standard error is in parenthesis
VITA

Cheryl Chesney Chambless was born January 10, 1949. She earned a Bachelor of Science degree in business education from Western Kentucky University in May, 1971. From the same University she received a Master of Arts degree in counselor education in 1972 and in 1974 a Specialist in Education degree in student personnel services in higher education.

Since 1973 she has been an admissions officer for Western Kentucky University in Bowling Green, Kentucky. She was promoted from admissions counselor to assistant director in 1976 and became the associate director in 1980. Since 1981 she has been the director of admissions. The Office of Admissions with a full-time staff of 16 is responsible for the University's enrollment management plan. As director she is responsible for the design and execution of a diversified student recruitment program, implementation of the University admission policies, and administration of the academic scholarship program.

Cheryl Chambless