

Fulfilling the Promise: Income, Financial Aid and

Persistence in Two-Year Colleges

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CHAPTER TWO

Review of Literature

Introduction

The contribution that advanced education makes to economic and social health is rarely questioned. This became even more critical in the Information Age and with the expansion of a global economy. However, the price of higher education is continuing to rise faster than family income and the general rate of inflation. The implication that, because of financial barriers, many low- and moderate-income students will not be able to attend an institution of higher education is cause for serious concern (The Committee on Student Financial Aid, 2002). These students will find it more difficult to earn a livable wage and can become further marginalized from the economic and social benefits derived from main stream society. Financial aid policies that do not target the needs of low- and moderate-income students cannot meet the goal of equal opportunity or equal access. It is imperative that researchers continue to assess and evaluate the impact of financial aid policies to ascertain if the needs of the disadvantaged are met.

Two-year public colleges are the primary institutions of open access in our higher education system. They provide a major source of educational opportunity for minority, low-income, and other disadvantaged students who otherwise could not attend. The current research examines the sufficiency of financial aid in promoting the persistence of low-income students in two-year public colleges.

In this chapter, a brief history and discussion of the evolution and changes in financial aid polices are discussed along with theoretical perspectives and research on

student persistence. This will provide the historical backdrop and research framework for the conceptual model used in this research.

Student Financial Aid in the United States

The analysis of financial aid and student persistence requires that any research be placed within the historical context of its time (Somers & St. John, 1997). A complete history of financial aid cannot be explored in detail within the limited space of this work. However, the more salient points of history are outlined and the specific trends and policies most applicable to this research are discussed in detail.

The federal role in higher education, especially prior to 1862, was limited. The U.S. Constitution was mute on education, leaving the primary role to the states. One of the earliest efforts of the federal government was the Northwest Ordinance of 1787 which offered each new state a grant of land (two townships) for a “seminary of learning” (Johnson, 1997). Later, the Morrill Act of 1862 built on the premise of improving the practical orientation of higher education through agriculture and the mechanical arts (Rudolf, 1990). Under the Act, the federal government transferred land to the states for developing colleges and providing a perpetual endowment. A portion of the proceeds could be used to purchase sites for the construction of college campuses with the balance of funds used for operations. After the Civil War, the Hatch Act of 1887 provided funds to create agricultural experiment stations and the Morrill Act of 1890 required that federal appropriations could not go to states that “denied admission on the basis of race unless they also set up separate but equal facilities. Seventeen states were so moved” (Rudolf, 1990, p. 254).

From 1890 to the Great Depression, there were few changes in the federal role in higher education. Only the Smith-Lever Act of 1914, which provided funds for agriculture and home economics and the Smith-Hughes Act of 1916 that “provided for college-level training of vocational education teachers” (Cofer, 1998, p. 3) were of material significance. The Reserve Officer Training Corps (ROTC) was adopted in 1916 to establish military training subsidies on college campuses.

During the Great Depression, the Federal Emergency Relief Administration (FERA) provided funds for student work and the National Youth Administration (NYA) funded jobs for college students. The NYA continued until 1943 when it was discontinued during World War II. The Student War Loan Program was a low-interest loan program created in 1942 to encourage technical and medical students, within two years of graduation, to complete their education. These were the first federal student aid programs that were direct to students (Adams & Stephens, 1970; Rivlin, 1961).

The Serviceman’s Readjustment Act of 1944 (GI Bill) was enacted to ease veterans back into the workforce by providing an incentive to pursue higher education. Modeled on a Canadian program for World War I veterans, this was the first mass program of direct student aid for higher education enacted by Congress. It was the last major expansion of the federal role until the passage of the National Defense Education Act of 1958 (NDEA).

The NDEA primarily targeted elementary and secondary education, vocational training and teacher education (Mumper, 1996). The Act created the first generally available loan, the National Defense Student Loan (NDSL), which was funded with 90% federal funds and 10% institutional funds. NDSL, later renamed the Perkins loan, was a

revolving loan program set up for colleges to loan and collect funds and recycle the principle and interest. Up to 50 percent of the loan could be forgiven if the recipient taught at an elementary or secondary school upon graduation (Rivlin, 1961). Two small and limited grant programs were part of NDEA, the National Defense Fellowships and the National Defense Language Fellowships were designed to assist the supply of college faculty and increase their geographic distribution (Cofer, 1998). These were the principle federal aid programs until the adoption of the Higher Education Act of 1965 (20 U.S.C. § 1001 et seq.).

Hannah (1996) explored the evolution of federal financial aid for higher education from the adoption of the Higher Education Act of 1965 to the 1992 Reauthorization. The primary driving forces behind the 1965 Act were the civil rights movement and Johnson's war on poverty. This focus allowed the promulgation of sweeping changes in the way the federal government addressed access to higher education. The 1965 Act built heavily on previous education initiatives: work-study, the 1944 GI Bill and the National Defense Education Act of 1958 (amended in 1963). It also addressed the goal of universal access by introducing "educational opportunities grants" for students with exceptional financial need, the Guaranteed Student Loan (GSL) for moderate-income families, and Upward Bound to identify and support minority students. Hannah (1996) concluded that the 1965 Act was the tipping point for financial aid policy moving away from institutions to the individual student.

The 1972 amendments to the Act embraced "equal opportunity" and introduced the Basic Educational Opportunity Grant (BEOG and later renamed Pell) coupled with the State Education Opportunity Grant (SEOG) and established the Student Loan

Marketing Association (Sallie Mae) to create more funding for the GSL program. Proprietary and non-college career and occupational programs were added to the definition of “postsecondary education,” allowing a large, new population of students to access the financial aid system. During the ‘70s, further amendments were adopted that expanded loan eligibility and federal loan guarantees. The BEOG (Pell grant) was extended to all needy full- and part-time undergraduate students, loan limits were raised, and a new parent loan program started. The ‘70’s ended with the removal of income eligibility requirements for postsecondary loans with the passage of the Middle Income Assistance Act of 1978 (Hannah, 1996, p. 504).

The 1992 Reauthorization was influenced by several factors that stifled any sweeping overhaul. Loan defaults had become half of annual program costs. Grant and loan programs had different eligibility criteria. Growing processing fees from the myriad of loan guarantors added unnecessary costs to a “risk-free” loan. Loan defaults and allegations of abuse and fraud were on the rise, and federal budget deficits loomed. The federal budget deficits of the 1980s along with a shift in the partisan makeup of Congress and the presidency created further changes in federal aid policy to education. Loan limits were raised along with interest rates but income caps were reintroduced to the GSL (renamed Stafford) program. Administrative procedures were reined in to address increased loan defaults and to tighten loan disbursement and collection. The original 1965 Act had effectively shifted from direct support in the form of grants to student and parent loan subsidies. In the “mid-1970s, about 76% of federal student aid was awarded in grants and 20% in loans; by the mid-1980s . . . , 67% to loans and 29% to grants”

(Hannah, 1996, p. 507). During this same period, the cost of college attendance grew by 45% while median disposable income only increased by 15%.

The 1998 Reauthorization of the Higher Education Act provided few changes to the scope and limits of federal financial aid policy. The Pell Grant ceiling was raised incrementally for each ensuing year covered by the Act through 2003 (American Association of Universities, 1998). Academic Achievement Incentive Grants were created for students graduating in the top 10% of their high school class. This was a merit based program not related to financial need. The State Student Incentive Grant Program was renamed the Leveraging Educational Assistance Partnership Program (LEAP). This program provided funds to states to match various programs, including a scholarship program for “students entering programs of study leading to degrees in mathematics, computer science, engineering, the teaching fields, or other fields of study determined by the State to be critical to the State’s workforce needs”

([//www.aau.edu/education/HR6Summary.html](http://www.aau.edu/education/HR6Summary.html)). Federal Family Education Loan Program (FFEL) interest rates were again modified to extend repayment for cumulative loans in excess of \$30,000. PLUS loan rates were modified to be the same as FFEL rates and Federal Consolidation Loans were clarified to allow maintenance of interest subsidy benefits. Federal Perkins Loan limits were increased for both undergraduates and graduate students. Overall, the 1998 provisions provided little in the way of substantial changes to the Act.

Tax incentives were introduced in 1997 as a separate source of indirect student financial assistance. The Taxpayer Relief Act of 1997 introduced Hope Scholarships,

Lifetime Learning Credits, interest deductions on educational loans and education IRA's to the tax code as new incentives for middle-income families. The Hope Scholarship allowed taxpayers a \$1500 tax credit for per year for educational expenses. The Lifetime Learning Credit was available for families that were not eligible for the Hope credit. Families were allowed a maximum \$1,000 annual credit per student in the household. Higher income families who do not qualify for the Hope or Lifetime Learning Credit were eligible for educational expense deductions of up to \$3000 per year. Families may also defer up to \$500 per year into an educational IRA. The primary beneficiaries of this strategy were middle- and high-income families (Gladieux, 2004). Low-income families might not benefit from tax credits or deductions and they might not have the disposable income to invest in education IRA's. There was no refund provision for families having no tax liability.

The trend toward tax incentives drifted into state policy. Many states created tuition tax credits and deductions, savings plans and prepaid plans (529 plans) that were not based on need. According to Gladieux (2004) many States were turning to merit-based aid to attract highly promising students with no consideration of need.

Theory and Research on Student Persistence

The theoretical background for persistence research is multi-disciplinary. The principle theoretical perspectives used to investigate student persistence are sociology, psychology, and economics. Each of these major theoretical threads will be examined to develop the scaffold for the most recent theoretical model used in this study.

Sociology was instrumental in defining persistence research at least since the work of social anthropologist, Talcott Parsons. Parsons (1959) identified education, and

in particular the school class, as a social system which acted as an agent of socialization. Education was described as a primary determinant in the selective process of allocating individuals to various occupational and social roles in society. Background characteristics such as *socioeconomic status, gender, ethnicity and ability* were factors in the process that can aid or hinder the socialization process. Parson's view was that the socialization process was benign in the selecting-out process.

Blau and Duncan (1964) examined the critical contribution that socioeconomic characteristics and education play in influencing social mobility and occupational status attainment. Their research was one of the first investigations of the relationship of social mobility and educational achievement. Only men were studied, which was a reflection of the time, but the results were nevertheless intriguing and relevant. Education has "the strongest direct effect on occupational achievements" (p. 403). Upward social mobility was common but mediated through education and largely predicated on prior socioeconomic status. Children coming from families with higher socioeconomic status and educational attainment were more likely to pursue higher education. Those from low socioeconomic status families were not as likely to pursue an education and therefore less likely to achieve high occupational status. The existence of frequent upward mobility was considered positive and indicative of American society:

...the egalitarian American ideology, which has no real counterpart in nations with a feudal past, is responsible for the stability of American democracy. The egalitarian ideology does not nullify the great differences in wealth

and power that exist in this country, but it alters their significance and thereby robs them of their sting. (p. 436)

Sewell and Shah (1967) further developed Parson's (1959) social allocation model with the addition of *individual ability*. The selecting out process worked through competition and merit. Students with the highest ability and proper socialization within the classroom were selected for continued educational opportunity. Sewell and Shah (1967) reported that socioeconomic status was critical in the choice to attend and complete college for both males and females. "...Many students with high intelligence are unlikely to aspire to a college education or to go to college—especially if they come from families of low socioeconomic status, are females, are members of disadvantaged racial groups, or come from rural backgrounds" (p. 3). Once in college, the influence of socioeconomic status lessened and ability assumed a larger role in the successful completion of a degree program. The decision to "plan" on going to college was pivotal for eventual matriculation to higher education.

Alexander and Eckland (1975) and Thomas, Alexander, and Eckland (1975) extended and replicated the research on occupational attainment through an extensive survey (by the Educational Testing Service) of 40,000 high school sophomores and seniors in 516 schools. *Individual ability, educational expectations, interpersonal variables, career contingency* and *student body composition* were added to background status in predicting educational attainment and occupational status. Using path analysis, the study concluded that background effects were mediated through education and that the level of educational attainment directly influenced both early and present occupational status. Ability was more important than socioeconomic status and

expectations although all were significant in predicting occupational attainment. This was one of the first studies that incorporated social-psychological variables (attitudes/expectations) as a part of the theoretical model and firmly established the importance of including background variables and individual ability in predicting social and economic mobility. It confirmed the important role education played in occupational and status attainment.

The 1970s brought a series of quasi-theoretical and the first major empirical research to the study of college and its impact on students. The initial sociological model of education (Astin, 1970) framed the role of college as a system that acted on students in a manner similar to industrial production. Students were, more or less, passive participants in the educational process provided by the institution. Spady (1970, 1971) added to the quasi-theoretical knowledge through the study of student “dropout” from college. Spady underscored the important role that student characteristics and actions played in their own educational development. The interplay between the student and the institution formed a dynamic relationship creating an environment necessary for student development and intellectual growth. Student involvement and effort were critical to success. These early works added enormously to the conceptual understanding of the student-institution relationship, but provided little in the way of empirical constructs that could be used to test their validity (Pascarella & Terenzini, 1991).

One of the most influential theoretical contributions to the study of student “dropout” came from Tinto (1975). Tinto viewed departure as a function of student academic and social integration into an institution. He borrowed the anthropological concepts of ritual and “rites of passage” from Van Gennep (1960) to describe the

integration process. This introduced both longitudinal and process elements to the study of student departure not found in the earlier work of Astin (1970). Students went through the process of *separation, transition and incorporation* when entering higher education. Students separated from their family and home environments and made the transition to the college environment. Once in college, background characteristics and ability combine with institutional socialization processes to incorporate the student into the higher education environment. These concepts were combined with Durkheim's (1951) sociological analysis of suicide such that a lack adequate social and academic integration (transition and incorporation) resulted in student attrition or "suicide." Tinto built on the earlier work of Astin (1970) expressing the importance of students' background characteristics, *ability, initial dispositions* and *educational aspirations* in combination with institutional characteristics and integration processes that bring together the student and the institution. Tinto's model of departure provided the platform for a large body of research on student attrition and persistence. In contrast to previous research, this model provided theoretical guidance for research based on an empirically defined set of variable constructs that could be evaluated and tested.

Pascarella and Terenzini (1977) first tested the Tinto (1975) model through a longitudinal study of the year-to-year persistence of 1,008 freshmen at Syracuse university. The study controlled for background variables of *sex, aptitude* and *personality attributes* to study the effect of different types of student-faculty interaction in predicting dropout. The results indicated that interactions that concentrated on intellectual and academic matters were the most influential interactions, followed by career discussions and academic advising.

Pascarella and Terenzini (1980) expanded their work by controlling for additional pre-college variables in researching the year-to-year persistence of 10,000 Syracuse University students. The research added the variable of *commitment* to both the institution and to goals toward graduation and degree attainment. Pascarella and Terenzini (1980) developed a thirty-four item instrument to measure the various dimensions of integration. The results indicated that “different dimensions of social and academic integration might have differential influences on decisions to persist or withdraw” (p. 70). Differences on the relative importance of the various interactional dimensions of academic and social integration were related to gender and other student characteristics.

Pascarella and Chapman (1983) examined the ability of the model to predict persistence at 11 four-year and two-year commuter and residential institutions. Persistence was defined as re-enrollment for the sophomore year. Institutional characteristics including *size*, *two-year* or *four-year*, *living on campus*, and *major* situated between background characteristics (*socioeconomic status*, *age*, *affiliation needs*, *achievement needs*, and *high school GPA*) and social/academic integration were incorporated in a statistical path analysis. *Goal commitment* and *institutional commitment* (measures of integration) were the precursors of persistence in this model. Institutional commitment was a greater predictor of persistence in four-year residential and four-year commuter institutions than in two-year institutions. Goal commitment was a better predictor in two-year colleges. Social integration was significant in predicting persistence in residential four-year institutions whereas academic integration had no direct effect. In four-year and two-year commuter institutions, academic integration had an indirect effect

on persistence through its effects on institutional commitment. Social integration had no significant effect at commuter institutions.

Pascarella, Duby and Iverson (1983), and Pascarella (1983) further tested the Tinto model with freshmen year persistence at a four-year commuter and a four-year residential institution. The addition of *intent to leave* was an important variable added to the theoretical model and improved its predictive ability. Two levels of goal and institutional commitment were added to assess changes in attitudes during the first-year experience. The results showed that the predictive nature of the model varied by the type of institution and by student characteristics. At four-year commuter institutions, academic integration was more important in predicting persistence than social integration. In fact, social integration had a negative influence on persistence in the commuter institution whereas in the residential institution it was positive and nearly equal to that of academic integration. For the commuter student, background characteristics were of equal importance to their experience in college, whereas on the residential campus, background characteristics were all mediated through the campus experience. The conclusion was that there were important gender differences critical to the specification of the model. *Intent to persist* had the strongest direct influence on predicting persistence and was an important contribution in the definition of the model.

Pascarella, Smart and Ethington (1986) examined the long-term persistence among two-year college students between the years 1971 and 1980, using data collected by the Cooperative Institutional Research Program. This was one of the first studies to use national data and one of the first to specifically examine two-year colleges. The study sample, 825 students from 85 two-year institutions, was small and generalizations were

difficult, however, the operational definition of variables was important for the research that followed. The variables of background (socio-economic status, parents education, and income), individual attributes (sex, ethnicity, educational goal, marital status), goal commitment I (highest expected degree), institutional commitment I (sum of “satisfied with college” and “expectation of transfer”), academic integration (sum of “average undergraduate grades” and “membership in honor society”), social integration (sum of involvement with peers and faculty), and institutional commitment/satisfaction II (satisfaction with last college attended) were defined in the study. The analysis did not incorporate intent to leave as did the earlier work (Pascarella, Duby, & Iverson, 1983; Halpin, 1990). These independent variables were hypothesized to be predictors of two dependent variables: *degree persistence* (still working on B.A. degree within nine years of enrollment) and *degree completion* (completion of minimum B.S. degree within nine years).

The findings were interesting on a number of levels. The data were disaggregated by gender which revealed that 53% of both male and female students had completed their B.A. degree within nine years of first enrolling. Additionally, 15% of men and 17% of women were continuing their pursuit of a degree. This indicated that persistence over a nine-year period was high for both men (78%) and women (70%). Academic integration, institutional commitment/satisfaction II and social integration were significant and positively correlated with male degree persistence. Academic integration, social integration, and socioeconomic status were significant and positively associated with female degree persistence. Academic and social integration both had a significant and positive influence for males and females toward degree completion, in contrast to earlier

work (Pascarella, Duby, & Iverson, 1983) on year-to-year persistence in two-year and four-year commuter institutions. Institutional commitment/satisfaction II and *secondary school academic accomplishment* were significant and positive influences on males. *Secondary-school social accomplishment* was significant and positively associated with females. The level of commitment to an initial two-year college enrollment was significant and negative for males. Initial goal commitment was not significant for either men or women in the study.

Nora, Attinasi and Matonak (1990) tested the Tinto model on two separate community college campuses and, despite disparate operational definitions of retention, found results similar to those of the previous research on commuter and two-year institutions (Pascarella, Duby, & Iverson, 1983). Halpin (1990) concluded that academic integration had a greater influence on year-to-year persistence of full-time, first-year community college students than social integration. Nora, et al., (1990) concluded that social integration had a negative influence on the retention of community college freshmen. Initial commitments had a significant and positive direct effect on both academic and social integration, but a negative effect on retention. Nora added the qualitative indicators of *getting ready* and *early college-going expectations* to the model. Getting ready was negatively associated with retention and *pre-matriculation on-campus experiences* and early college-going expectations were not significant to institutional and goal commitment and negatively effected retention.

Christie and Dinham (1991) conducted one of the few qualitative examinations of the Tinto theory of departure using the constructs from Van Gennep's, *The Rites of Passage* (1960). A sample of 25 first-time, white, full-time freshmen was selected from a

list of students at a large public four-year university. Ten of the students were interviewed in the fall semester and all 25 were interviewed in the spring. Open-ended interviews were used to explore Tinto's departure model and the constructs represented as the *rites of passage* into the college community. Living on campus and participation in extracurricular activities were important factors and stand out as being representative of social integration. External factors, including high school friends, were found to be important factors for integration. Having high school friends attending the same college was important to integration, whereas, non-college high school friends have a negative influence. During the process of transition and incorporation, students became more attached to college friends than to non-college high school friends. Extracurricular activities assisted in this process. Students became more reliant on themselves than on their parents and those with parents who encouraged living on campus and taking part in extracurricular activities seemed to make the transition quicker. These findings corroborated Tinto's (1988) concepts of *isolation* and *congruence*. Failure of a student to make the necessary contacts (social integration) on campus resulted in isolation and receiving the necessary external and internal support for college commitments resulted in congruence with the institution. This is consistent with Bean's (1980) model of student attrition (discussed below).

Recognized limitations of Tinto's departure model have been expressed in two primary concerns. Tierney (1992) criticized the Tinto model for its reliance on a faulty interpretation of Van Gennep's (1960) *Rites of Passage* as the construct for social and academic integration. The criticism was primarily founded on semantic and philosophical differences over the use of a concept, "rite of passage" that may not apply as well to

modern society as it does to primitive society. There can be no failure to negotiate a rite of passage in primitive society. Tinto (1982, 1988) recognized these limitations as “individuals in college may choose not to become incorporated in the community of the college” (p. 447), and separation, transition and incorporation may not be expressed equally among all people. The model failed to consider gender, ethnicity, social status, and background thoroughly, and did not adequately predict student attrition.

A second major weakness was that the model largely ignored non-institutional and economic variables that influenced one’s decision to attend and remain in college. This reduced the model’s effectiveness to analyze those factors and policies designed to increase access and persistence. Tinto (1982) was very concerned about the model's ability to incorporate student transfer as opposed to complete withdrawal from the system and its failure to represent the economically disadvantaged student: "...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).

Undervaluing the relevance of price/cost related variables, the model failed to adequately incorporate student finances and other factors that are external to the institution.

Regardless of the criticism, the model remains an overarching theoretical framework in persistence research.

An alternative theoretical model came from theories of organizational turnover in the workplace (Bean, 1980, 1982, 1985; Metzner & Bean, 1987). Bean (1980) disputed Tinto’s analogy of suicide in the attrition process as not having sufficient empirical evidence for a theoretical construct. Bean claimed that attrition was more analogous to workplace turnover.

Bean (1982) tested his model of student attrition, defined as the cessation of enrollment at an institution of higher education, at a single midwestern four-year university. A strictly defined survey sample of 1,195 traditional-aged students in English composition classes was selected for the research. Twenty-eight variables were analyzed in both a multiple regression and path analyses to determine direct and indirect effects on attrition. The independent variable set included background characteristics (*performance*, socioeconomic status, *state resident*, *distance to home*, and *hometown size*), organizational characteristics (*routinization*, *development*, *practical value*, *institutional quality*, integration, university GPA was a proxy for pay, goal commitment, *communication*, *distributive justice*, *centralization*, *advisor*, staff/faculty relationship, campus job, *major*, housing, *campus organizations*, *opportunity for transfer*) and intervening variables of satisfaction and institutional commitment.

For women, institutional commitment, institutional quality, and routinization had the strongest effects on attrition. Institutional commitment, routinization, satisfaction, and communication were the strongest factors for men. Institutional commitment was the most significant variable for both sexes, which was consistent with the Tinto model. Bean (1980) concluded that "...the determinants borrowed from the causal model of turnover—including routinization, three measures of development, university GPA, practical value, and institutional quality, along with satisfaction—dominate the model" (p.177). The model supported the notion that men and women leave college for different reasons.

Bean (1982) reduced his model to 10 determinants and added *intent to leave* as an intervening variable important in predicting student attrition (Azjen & Fishbein, 1980;

Metzner, et al., 1987). The background variables were omitted from the reduced model based on Bean's earlier research, which did not find them significant after college entrance. Bean applied 10 determinants (*practical value, certainty of choice, loyalty, grades, courses, educational goals, major and job certainty, opportunity and family approval*) to the organizational, personal and environmental variables to establish their influence on the intervening variable of intent to leave and subsequent attrition. A two-stage longitudinal survey of 1,574 traditional-age freshmen students at a major midwestern land-grant university was conducted in the fall and spring terms of 1979-80 to test the reduced model. The sample was subdivided by gender and by students' *level of confidence*. For all groups, intent to leave had the largest direct effect on attrition followed by grades, opportunity for transfer, practical value, certainty of choice, loyalty, family approval, courses, student goals, major and occupational certainty. The results varied by gender and level of confidence as anticipated by prior research.

Metzner, et al. (1987) refined and adjusted the model by reincorporating the background variables and redefining the personal (psychological), organizational and environmental variables. It was tested on a sample of non-traditional students at a large, primarily commuter, mid-western university. The study indicated that GPA and intent to leave were the best predictors of attrition followed by a background variable: *hours enrolled*. "Background factors were significantly related to GPA as were two of the academic variables" (p. 25) and they also affected the psychological outcomes. Social integration had no significant impact on dropout which was consistent with previous research on commuter institutions (Pascarella, Duby, et al., 1983). Hours enrolled and *study skills* were significant in predicting attrition. Utility had the largest effect on intent

to leave, a key concept coming from research on organizational turnover was, therefore, important in studying attrition. Background characteristics had a larger influence on nontraditional students' psychological, grade and persistence outcomes than they did on traditional students, although nearly all of the effect is indirect. In summary Bean concludes that:

...commuter student dropout was a function of academic performance (GPA and low high school performance) and commitment to the institution (high levels of intent to leave and absenteeism, and enrolling for fewer credit hours per term). In addition, utility, satisfaction, opportunity to transfer, and age influenced dropout through intent to leave. Absenteeism, age, high school performance, and ethnicity had notable indirect effects on dropout through GPA. (p. 33)

Bean (1985) and Metzner, et al. (1987) introduced *finances* as a variable in the model for the first time although it was not significant in the analysis.

Cabrera, Casteneda, Amaury, and Hengstler (1992) analyzed the Tinto (1975) model of student departure model and the Bean (1985) and Metzner, et al., (1987) model of student attrition and merged them into a single theoretical framework identifying eleven significant variables to predict persistence (attrition). The analysis used a statistical modeling technique to reveal the differences and similarities of the two theoretical approaches and to precisely define the variables that predicted student persistence. According to Cabrera, et al., (1992), both of the original theoretical models correctly suggested that student persistence involved many complex “personal and institutional” factors. Persistence involved a match between the college or university and

the student. The constructs contained in the two theories were not mutually exclusive, but complemented each other and could be used to create a new model that integrated both theoretical viewpoints. The use of a combined set of student persistence variables created a valuable tool for researchers to explore, in more detail, the precise nature of these variables and the role that they played in determining persistence. Viewing the interrelationship of these variables through time could have important implications in determining and/or evaluating educational policies developed at the local, state and federal level. The particular utility of this analysis was the delineation of a model consisting of eleven significant variables that could be used in research and policy analysis. These included: intent to persist, GPA, institutional commitment, encouragement from friends and family, goal commitment, academic integration, financial attitudes, and social integration. The inclusion of financial attitude was a key contribution in understanding attrition.

The sociological and psychological components of persistence/attrition research were well established as the foregoing review indicated. Much of the earlier work was descriptive in nature and not specified to take advantage of information collected from large national samples. Most empirical research occurred in single institution samples with the objective of developing a causal model of student dropout/attrition. The results had limited applicability in assessing state or federal policies, especially those dealing with financial aid, which is the primary concern of this study. Economic theory provides an additional dimension to the model that makes it more effective in addressing many of the policy issues that were important to students and institutions of higher education.

Incorporating economic concepts added enormous power to our capacity for assessing the effectiveness of financial aid policies at the federal, state and institutional level. Human capital theory (Becker, 1964) formed the conceptual foundation by incorporating the concept of investment. The investment principle (Rusbult, 1980) suggested that we invest in those things that improve our economic and psychic returns. Investments come in many forms including the acquisition of education and training as a means to create capital for improved social and economic conditions both on a personal and societal level. A college education can be viewed as a choice based on a rational evaluation of investment alternatives. The choices may be to go to college, remain in college, enter the workforce, join the armed services, or pursue other alternatives.

Demand theory added to our understanding of the economic mechanisms of choice. The demand for higher education is a function of available resources, price, the cost of alternative choices, and the predisposition of the potential student toward a specific good. In the educational context this is interpreted to mean that a student will invest in more education if prices are low and less if prices are higher. It is the supply and demand function of elementary economics.

Several demand studies were analyzed by Leslie and Brinkman (1987, 1988). In a meta-analysis of twenty-five student demand studies, a *student price response coefficient* (SPRC) was calculated to predict changes in enrollment based on changes in price. Price was defined as tuition and fees, minus any financial aid received in the form of grants. An aggregate SPRC was calculated for the first-time enrollment of traditional students between 18 and 24 years-of-age. The SPRC calculated was $-.70$ for every \$100 increase in tuition such that for each \$100 increase in aggregate tuition, enrollment should drop by

.70 %. The SPRC was higher for two-year colleges (.90) than for public four-year colleges (.60 to .70) and private schools (.20 to .50). The broader conclusion of this research was that students do respond to price and that enrollments vary by the prices charged. Reductions or increases in price through tuition and/or financial aid changes increased or decreased access, enrollment, and persistence. “Student aid does promote choice. Because of aid, additional low-income students are able to attend relatively costly four-year and private institutions” (Leslie & Brinkman, 1987, p. 16).

Kane (1999) updated the work of Leslie and Brinkman (1987, 1988) and concluded that students in community colleges were more sensitive to tuition increases than their counterparts in four-year public and private institutions. Low-income students were more susceptible to increases in price than other income groups. Low-income students, in the early 1990’s, on average received grant and other aid in excess of the price of tuition at both public two-year and four-year colleges. However, this figure was misleading as it failed to consider the opportunity cost of attending college for low-income students with little ability to pay other living expenses outside the cost of college (Kane, 1999).

Student demand studies captured the important contribution that college price and financial aid played in the study of persistence (Corazzini, Dugan, & Grabowski, 1972). Leslie and Brinkman (1988) explained the importance of further research to assess federal, state and local policies on tuition and financial aid. The weakness of the student demand studies lay in the relative inability of SPRC’s to predict enrollment or persistence during a time of rapid tuition increases and reduced financial aid (St. John, 1993). Some of this variance could be explained by the peculiar nature of education as an investment.

It is much more inelastic (less sensitive to price) than normal consumer items in the marketplace and often is viewed as a trust market (Trow, 1996). Different social and income groups could have different responses to the price of higher education (Heller, 1997; St. John, 1993).

St. John (1993) examined three separate methods of projecting college enrollment using different price response measures. The first method used a traditional standardized price response coefficient based on net price (tuition minus grants). The second method incorporated a *differentiated cash flow elasticity* response measure for tuition and all types of aid. The third model used differentiated cash flow elasticity cross-tabulated with student income. All three models were compared to 1980 and 1985 National Center for Educational Statistics (NCES) data on actual enrollment to determine their relative predictive value compared to NCES (demographic) projections for 1985.

None of the models accurately predicted the enrollment pattern that emerged in 1985 although the differentiated cash flow elasticity model was the most accurate of the three. It was concluded that the *net-price* models had serious predictive limitations and that traditional demographic models failed to consider the effects of student “aid policies on the redistribution of enrollment” (p. 686). Differentiated models would allow policy makers the ability to examine the effects that various combinations of price and subsidy have on enrollment. Importantly, the differentiated models indicated that shifts in price and price subsidy policies affected student enrollment choices and persistence decisions and these influences changed over time. The conclusion was that there were no standard measures that can be used to predict enrollment and persistence since these outcomes change over time as a result of both policy and non-policy related issues.

Persistence theory evolved from the early conceptualization of students as actors in a socialization process over which they have little control (Blau & Duncan, 1964; Parsons, 1959) to the process models coming from social psychology (Pascarella, 1983; Pascarella & Chapman, 1983; Pascarella, Duby, & Iverson, 1983; Pascarella, Smart, and Ethington, 1986; Pascarella & Terenzini, 1977, 1980, 1991), to the economic models based on human capital theory (Becker, 1964) and investment theory (Rusbult, 1980). The economic theories have grown from the early work on standardized student price response coefficients (Leslie & Brinkman, 1987, 1988), to differentiated models based on a combination of price and aid (St. John, 1990a, 1990b, 1992, 1993). Much of the subsequent research on financial aid and its relationship to persistence follows the differentiated approach that incorporated various dimensions of sociological, psychological, and economic theories.

Models that incorporated the best of these concepts should provide the greatest utility for financial aid policy analysis. The need for greater analytical power to investigate the effects of student finances and financial aid led to the development of new models that are more precise at measuring and identifying these factors in a systematic way. This may be characterized as the differentiated model, and it generally followed the work of St. John (1989, 1990a, 1990b, 1992, 1993, 1994), St. John, Oescher, & Andrieu (1992), Terkla (1985), and Voorhees (1985). Financial aid variables including *grants*, *loans*, and *work-study* were incorporated into the model making it particularly effective in evaluating student persistence in terms of financial aid policies. The model was adapted for use with large national data bases such as those published by the National Center for Education Statistics (NCES). It was used in studying the effects of price and

price subsidies in the form of financial aid across the full spectrum of institutional type, and by student gender, ethnicity, and income.

Terkla (1985) conducted an empirical investigation of national financial aid policy using a sample of 343 financial aid recipients to study high-need students at a large urban commuter campus. Persistence was defined as enrollment over a three-semester period. LISREL (Linear Structural Relations) modeling was used to investigate the relationship between a series of fourteen variables (housing, grants, loans, *need*, *minority status*, residency status, sex, *ACT composite score*, high school rank, cumulative GPA and, finally, persistence) in a causal model. The results indicated that all of the federal campus-based aid programs had a positive effect on persistence. Cumulative grade point had the highest effect followed by the National Direct Student Loan, work-study, and grants. This finding was contrary to the previous work of Astin (1975), which found that loans were ineffective.

St. John (1989) performed one of the first studies of financial aid and persistence that used national survey data. The sample was from the National Longitudinal Study of the High School Class of 1972 (NLS:72) collected by the National Center for Education Statistics. Financial assistance was defined as “the receipt of grants, loans, and/or college work-study funds” (p. 11). Persistence was operationally defined as “...any student who (1) enrolled in an academic program at a two-year or a four-year institution by October 1972, (2) had not obtained a bachelor’s degree or an associate’s degree by May 1979, and (3) was no longer enrolled in college in May 1979” (p. 12). Transfers were not counted as persisters. The model included “...student background (socioeconomic status, race, sex), pre-college academic, occupational and education aspirations, institutional

characteristics, college performance and financial assistance” (p. 13) as predictors of persistence. Financial assistance was important in the choice to remain in college. Only high-school GPA and degree goals (aspirations) had higher effects.

St. John (1989) conducted longitudinal analyses of persistence using NLS:72, the High School and Beyond Senior Cohort of 1980 (HSB:80) and the High School and Beyond Sophomore Cohort of 1982 (HSB:82). The research was specifically designed to examine the role of financial aid on persistence (defined as year-to-year in this project) and how it changed over time. St. John defined social background, academic ability, high school experience, college experience, and student financial aid as predictors of persistence. The model was specified to the constraints of the national data bases and was the first example of the differentiated model of persistence as well as the first to analyze the data using logistic regression. This statistical procedure was considered a better method when the outcome variable was dichotomous. Beta coefficients were converted to delta-*p* statistics, which provided a probability measure of effect per unit change in the independent variable.

Results indicated that the effects of all of the variables changed over the course of a students’ academic career (freshman to sophomore to junior to senior) and that there were differences depending on the cohort examined. Effects varied for the same cohort over a single college career, and they varied for different cohorts during different time periods. Social background and high school experience influenced persistence. Aspirations, in the form of postsecondary plans, were consistently important as were college experiences. Attending full-time, grades and beginning school in a four-year institution were all positive indicators of persistence. These results were consistent with

Astin (1975), in that loans were negatively associated with persistence in the first-to-second year of attendance during the 1970's. The results were reversed in the 1980's with loans being positively associated with persistence.

St. John (1990a, 1990b) examined enrollment and persistence at all institutions of higher education in a series of two studies using HSB:82 and NLS:72. The research examined the additional premise that price-response coefficients changed over time as a result of changing financial aid policies. The model was differentiated to investigate student sensitivity to price (tuition) in conjunction with the various types of financial aid (grants, loans and work-study) and student income. St. John introduced the variable of *debt burden* to examine the influence of accumulated debt over time. Family income was a positive influence on both enrollment and persistence. Tuition was significant and negatively associated with enrollment decisions, but was not significant for first-to-second year persistence. All of the aid variables were statistically significant and a positive influence on enrollment. Grants and loans were significant and positive for persistence in the first-to-second year of college. Tuition was significant and negatively associated with persistence from the second-to-third year persistence. All of the financial aid variables were positively associated with second-to-third year persistence. Loans and work-study were positive for third to fourth year persistence but tuition and grants were not significant. Neither tuition nor any of the financial aid variables were significant in the fourth-to-fifth year of attendance. Overall, students were influenced more by the financial aid they received than the tuition they were charged although it was not determined that one type of financial aid was more effective than another. Enrollment decisions were more sensitive to tuition than persistence decisions. Debt was not

significant in any of the transitions. Family income was positively associated with persistence and enrollment indicating the insufficiency of financial aid for students with limited income in the class of 1980. Only middle-income families were responsive to loans in enrollment decisions.

St. John, Kirshtein, and Noell (1991) used the differentiated model to examine year-to-year persistence using the HSB:80 senior cohort. Interestingly in this research, the *price* (tuition) variable was omitted from the model, although it did include variables from the Tinto (1975) model of departure and the attainment model of Thomas, et al., (1979). A series of logistic regressions were performed adding variables to the model to test for predictive capability. The results indicated that background characteristics had differing influences on persistence at differing times in the college experience. “Social background increases in importance and academic preparation decreases in importance over the long term” (St. John, et al., 1991, p. 401). College experience, grades, and attending college full-time were all positive influences on each year of college persistence. Loans and grants were both positive for persistence.

St. John, Oescher, and Andrieu (1992) refined the differentiated model and reintroduced the price (tuition) variable in the first study using the National Postsecondary Student Aid Study of 1987 (NPSAS:87). This was the first national data analysis to break down the study of persistence by type of student (traditional-aged in this case) and type of institution (four-year public v. private) recognizing the variability between institutional type. This research introduced the notion of within-year persistence to the model, defined as “reenrollment during the spring semester after being enrolled in the fall semester” (p. 29), as an effective way to examine the effectiveness of financial

aid to promote persistence (Carroll, 1987). The model included background variables (ethnicity, family income, *mother's education*, age, whether the student was working, and *marital status*), *high school experience* (receipt of high school degree), aspirations (some college, master's degree, and advanced degree), college experience (grades less than C average, C average, and A average, compared to B average), price (tuition, grants, loans and work) all divided by 1,000. Many of the usual variables for persistence studies, especially the social psychological and attitudinal variables, were not available with the NPSAS:87 data and the limitations were noted in the research. Logistic regression was used as the statistical method and the beta weights were all converted to delta p 's as in previous models.

The indicated that being male was positively associated with persistence in both public and private four-year colleges. Age was positively associated with public college persistence, but not in private schools. Being independent was negatively associated with persistence in private colleges but not public colleges. Full-time attendance was negatively associated with persistence in public colleges but not private, a finding which was inconsistent with prior research on year-to-year persistence (St. John, 1989). College grades were significantly associated with persistence at both public and private schools although the relationship was not linear. "Year in college" was positively associated with persistence for freshmen and sophomores but, negatively associated with persistence for seniors in public schools and negatively associated with senior persistence in private colleges. Aspirations were significant and negatively associated with persistence, except for *some college* in public colleges, at both public and private institutions. Tuition was negatively associated with persistence at both public and private colleges. Grants were

negatively associated with persistence in public schools, contrary to previous research, and only significant at the $p < .10$ level in private schools although positive. Loans were not significant at private colleges and only significant at the $p < .10$ level, and negative, in public schools. Working outside of school was not significant in public schools but was negatively associated with persistence in private colleges.

Andrieu and St. John (1993) used the same model to explore the within-year persistence of graduate students and adapted it for use with NPSAS:87. Two variables were added to the model to reflect the different circumstances that surround graduate education. These variables are *expected earnings after graduation* and *assistantships*. Four background variables were significant influences on within-year persistence: students whose mothers had less than a high school degree; students whose mothers had some college (positive); students with mothers holding advanced degrees (negative); and independent students (negative). Two graduate experience variables were significant: being a continuing student (negative) and attending a private college (positive). Expected earnings were not significant in the model. Two of the price variables were significant: tuition (negative) and assistantships (negative). When the model was disaggregated into public versus private colleges there were no significant background variables for private colleges, whereas in public colleges, students whose mothers had some college were more likely to persist, independent students and continuing students were less likely to persist. Expected earnings was significant and negative for public colleges. Students with lower expected earnings were not as likely to persist. Tuition and assistantships were both negative for graduate persistence.

St. John, Andrieu, Oescher and Starkey (1994) repeated previous research on traditional-aged college students (St. John, Oescher, and Andrieu, 1992) by adjusting the model to examine three different combinations of financial aid variables. The first version included the *total amount of aid* (grants, loans, and work-study) and the tuition charged. The second version included the “amount of tuition charged, the amount of the three types of aid received, and unmet need” (p. 459). The third version was differentiated by the tuition amount, “grants only, loans only, grants and loans, grants and work, loans and work and all three types of aid” (p. 459). The fourth version included all of the version three variables plus the variable *unmet need*. The final version contained unmet need, tuition and the amount of grants, loans and work awarded. Sequential logistic regression was used to step in the variables and produce the analysis of the five versions. Tuition had a strong influence on within-year persistence. The type and amount of financial aid influenced within-year persistence although some types of aid had negative influence. The negative influence of financial aid was argued to be the result of the insufficiency of financial aid to promote persistence. It was also noted that there were differences in study findings between year-to-year persistence and within-year persistence. The importance of the work was the refinement and further development of a consistent and replicable model that can be used in analyzing the large national survey databases produced by the National Center for Education Statistics. This was extremely important for evaluation of national financial aid policies.

St. John and Starkey (1994) introduced the model to the study of persistence in two-year public colleges. This is the first use of the model for this segment of higher education and was important in the development of model specifications for the current

research. The model was slightly adjusted to look at the specific elements of community colleges. *Being married* or not was added to the financial background variables.

Vocational training, a common component of community college curricula, was added to the aspiration variables. The differentiated model of financial aid (grants, loans and work) and tuition was used for the analysis. The logistic regression indicated that two background variables were significant: being African-American and age were positively associated with persistence. Having a GED was a positive high school experience indicator of persistence. Three college experience variables were significant: being a full-time student was negative, being a freshman was positive, and having below C grades were positively associated with persistence. This was consistent with the findings for four-year schools (St. John, et al., 1994). None of the aspiration variables were significant beyond the $p < .05$ level but vocational training was positive at a $p < .05$ level of significance. Tuition was significant and negatively associated with persistence. Of the financial aid variables, only grants were significant and negatively associated with persistence indicating the insufficiency of grant awards.

The model was adjusted by St. John, Starkey, Paulsen, and Mbaduagha (1995) to study within-year persistence in proprietary schools. The postsecondary experience variables were modified to include the *number of clock hours*. The variable definition of “aspirations” was modified to include *attain a vocational qualification or some college*. The background variables and price variables remained the same as the previous research (St. John & Starkey, 1994). The variables were stepped into the logistic model in a series of regressions and the model proved to be effective for predicting within-year persistence in proprietary schools. The results of the research indicated that many minorities and

economically disadvantaged students attend proprietary schools. African-Americans and Hispanics were more likely to persist than other ethnic groups. Income had no association with persistence in any model iterations. Not having a high school degree was positively associated with persistence. Tuition had a large and negative association and financial aid had only minor positive or no influence on persistence.

The utility of the differentiated financial aid model for analyzing enrollment and persistence has been fairly well established. Several further adjustments and studies were conducted by St. John and associates using NPSAS:87. These studies included an analysis of the effects of tuition and financial aid for adult students in public and private four-year colleges (St. John & Starkey, 1995b), adult students in two-year colleges (Hippensteel, St. John, & Starkey, 1996), and by ethnicity in two-year and four-year colleges and universities (Kaltenbaugh, St. John, & Starkey, 1999).

In the late 1990s, research conducted with the differentiated financial aid model branched into two different paths. Each path used the differentiated model as the underlying platform for persistence research. The first path was followed by St. John and associates (discussed and summarized above) and the second approach was developed by Cofer and Somers for a more detailed examination of later versions of NPSAS data and to study the effects of debt and changes in financial aid policies.

Somers and St. John (1997) conducted an institutional comparative analysis of student price response using the differentiated model of financial aid developed by St. John to analyze the impact of financial aid on the first-time enrollment of students. Four separate colleges and universities were selected for the study including a public comprehensive four-year college, a private comprehensive four-year college, and two

doctoral granting universities with differing financial aid policies. The major conclusions were: (1) the previous assumption that a universal coefficient for analyzing the effects of tuition and financial aid was not possible, even for enrollment decisions; (2) negative associations between financial aid variables and enrollment might be a function of the sufficiency of financial aid; (3) the types of financial aid have varying effects on different students. The study raised an important question concerning the federal shift in financial aid policy away from grants to loans throughout the 1980s. This concern was the jumping off point for studies that explored the effects of debt on student persistence, which was the focus of the Cofer and Somers line of research.

Cofer (1998) added the variable of *accumulated debt* to study within-year persistence of four-year college students between 1987 and 1996. This provided a detailed look at the effect of changes in financial aid policies over time. The effects of financial aid on different student income strata (low, middle and high) were compared. NPSAS:87 and NPSAS:96 were the survey data used for the analysis and provided a relatively consistent data source for comparison. The results indicated that there were changes in the influence of college experience and financial aid variables on persistence and those changes were different for different income groups.

For low-income students, all of the academic class variables were significant in 1996 as compared to only seniors in the 1987 sample. Tuition was significant and negative in 1987 and significant and slightly positive but negligible in 1996. The influence of grants was significant and positive in both years and at nearly the same effect size. Loans were positive and significant with nearly the same effect size in both years. Work-study was positive and significant in 1987 but had lost its effect by 1996.

The influence of debt changed dramatically with high and low levels of debt being significant and negative in 1996, compared to only high levels of debt in 1987.

The change for middle-income students was not as dramatic. Again, class variables were all significant in 1996 as opposed to just seniors in 1987. The financial variables only displayed minor changes. Tuition was negative and significant in 1987 and in 1996 although the latter effect size was minimal. There was no significant association with any of the accumulated debt levels in either year. Work-study was significant and positive for 1996 as opposed to 1987.

Higher-income students showed a number of changes between 1987 and 1996. None of the ethnicity and background variables that were significant in 1987 remained so in 1996. Like the low- and moderate-income groups, class variables were all significant in 1996. Tuition was still significant and negative in 1996 although, like the other groups, the effect size had become minimal. Grants increased their effect in 1996. Loans became positive and significant in 1996. Work-study was not significant in either year. No accumulated debt levels were significant in 1987, although medium debt had become significant with a very high effect in 1996.

The implications of the analysis for federal financial aid policy are far reaching. While the changes to financial aid policy in the 1992 Reauthorization of the Higher Education Act actually improved the ability of middle-income students to enroll and persist, the growing importance of loans created disproportionately large negative effects on low-income students. “Even though they attended low-cost, public institutions, low-income students were forced to borrow and accumulate more debt...and low-income students were persisting at a lower rate” (Cofer, 1998, p. 167).

Cofer and Somers (1999) applied the model to NPSAS:93 to assess the relative predictive ability of two alternative models: one with *total debt load* and the other using a *threshold of debt*. Total debt load was equal to Cofer's (1998) variable of accumulated debt, and threshold of debt was equal to Cofer's (1998) differentiation of accumulated debt into thirds (high, medium and low) based on frequency distributions of the financial aid data from NPSAS. The results indicated that the threshold of debt model was more effective in analyzing the nuances of financial aid and in particular the accumulation of debt. This research was important in establishing the necessity of looking at student persistence over time and that no model can be uniformly applied to all students. The model used in the study did an excellent job of predicting persistence but was not particularly effective at predicting non-persisters. It was suggested that this might be attributable to variables outside those contained in NPSAS data. Families were willing to incur debt but that willingness seemed to have an upper limit at which point increased debt burden became a negative influence on persistence.

This research spawned a series of additional studies (Cofer & Somers, 2000; Somers, Cofer, Below, & Freeman (2002a); Somers, Cofer, Hoef, Langrehr, & Selsor, 2002b; Martin & Somers, 2002; Freeman, 2003; Hoef, 2002a; Langrehr, 2003; Martin, 2000) using various editions of the National Postsecondary Student Aid Study (NPSAS) to evaluate the effects of financial aid and debt on student persistence. The tabulated results of this research are shown in Table 1 as a summary of the research on two-year colleges, which are the focus of this research. A summary of research results for four-year colleges is displayed in the Appendix. This growing body of research filled important gaps in the research on student financial aid policy and its effects over time.

Table 1

Summary of Significant Delta – P Statistics for Two-Year Colleges

Variable	St. John & Starkey (1994) NPSAS:87	Hippen- steel et al., (1996) NPSAS:87	Cofer & Somers (2001) All Students NPSAS:93	Cofer & Somers (2000) All Students NPSAS:96	Martin (2000) NPSAS:96 First-Time Students BPS	Somers, Cofer, Hoef, et al., (2002)* NPSAS:96 Traditional Age Students
Male	-	-	-	-	-	0.0193
African-American	0.0610	0.0561	-	-	-	0.0289
Other	-	-	0.0734	-	-	0.0746
Dependent	-	-	0.0357	0.0972	-	0.1143
Under 22	*	-	-	-	-	-0.0454
Over 30	*	-	-	0.0623	-	-
Disability	-	-	-	-	-	-0.0603
Income < \$11,000	-	-	-	-	-0.1561	-0.0283
Income > \$60,000	-	-	-	-	0.0960	0.0474
Mother with HiED Exp.	-	-	-	-	-	-0.0344
Father with HiED Exp.	-	-	-	-	-	-
Aspiration Adv. Deg.	-0.0726	-	0.1010	0.0904	-	0.2437
Aspiration Col. Deg.	*	-	0.0745	0.0791	-	-
GED	0.0784	-	-	-0.0725	-0.1799	-
No Diploma	-	-	-	-	-0.1986	-
Public Inst.	-	-	-	0.1000	-	-0.0935

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Summary of Significant Delta – P Statistics for Two-Year Colleges

Variable	St. John & Starkey (1994) NPSAS:87	Hippen- steel et al., (1996) NPSAS:87	Cofer & Somers (2001) All Students NPSAS:93	Cofer & Somers (2000) All Students NPSAS:96	Martin (2000) NPSAS:96 First-Time Students BPS	Somers, Cofer, Hoef, et al., (2002)* NPSAS:96 Traditional Age Students
Low GP A	0.0745	0.0755	-0.1967	-0.0956	-0.3272	-0.3013
High GP A	-	-	-	-	-	-0.0535
No GPA	-	-	-	-	-	-
Live On- Campus	-	-	-	-	-	-0.0882
Work Full-Time	-	-	-0.0773	-	-0.1269	-
Remedial	-	-	-	-	-	-0.0628
Sophomore	-	-	0.1036	-	-	-
Attend Full-Time	-0.0384	-	-	0.2884	0.0774	0.3267
Tuition	-0.1399	-	-0.0057	-4.9 X 10 ⁻⁵	-0.0548	-4.96 X 10 ⁻⁵
Grants	-0.0569	-0.1755	0.0684	0.1214	0.0876	0.0999
Loans	-	-0.0412	0.0245	0.0775	0.0476	0.0515
Work Study	-	-	-	0.1705	-	0.1739
High Debt	-	-	-0.0834	0.1596	-	-
Low Debt	-	-	-	-0.0485	-	-
Met with Friends	-	-	-	-	-	-
Met with Advisor	-	-	-	-	0.0705	-

Table 1

Summary of Significant Delta – P Statistics for Two-Year Colleges

Variable	Somers, Cofer, Below, et al., (2002) All Students NPSAS:96			Somers, Cofer, Hoef, et al., (2002) All Students NPSAS:96			Langrehr (2003) NPSAS:96 First-Time Students BPS		
	White	African American	Hispanic	All	Male	Female	All	Adult	Trad- itional
Gender	-	-	-	-	-0.0193	-	-	-	-
Male	-	-	-0.0980	-	-	-	-	-	-
African American	-	-	-	-	0.0289	0.0810	-	-	-
Other	-	-	-	0.0746	-	0.1100	-	-	-
Minority	-	-	-	-	-	-	-	-	-
Married		0.0940	-0.0790	-	-	-	-	-	-
Dependent	0.057	0.1540	0.2480	-	-	-	-	-	-
Under 22		-0.0970	-0.2680	-0.0454	0.0306	-0.1100	-	-	-
Over 30	0.050	0.0690	-0.1070	-	-	0.0329	-	-	-
Disability	-0.064	-0.2920	0.2490	-0.0603	-0.0953	-	-	-	-
Income < \$11,000	-	-	-	0.0474	0.0421	0.0430	-0.1153	-	-0.112
Income > \$60,000	0.071	-	-	-0.0283	-	-0.0296	0.0726	-	0.0709
Mother wi HiED									
Exp.	-	-	0.1220	-0.0344	-	-0.0808	-	-	-
Father with Adv. Deg	-0.031	-	-	-	-0.0427	-	-	-	-
Aspiration Adv. Deg.	0.4000	-	-	-	-	-	-	-	-
Aspiration Col. Deg.	-0.4200	-	-	-	-	-	-	-	-
Missing Asp.	-	-	-	-0.0368	-0.0771	-	-	-	-
GED	-	-	-	-	-	-	-0.154	-2.108	-0.1265
No Diploma	0.3950	-	-	-	-	-	-0.1680	-	-0.1973
Low Test Scores				-	-0.0843	0.0559	-	-	-

Table 1

Summary of Significant Delta – P Statistics for Two-Year Colleges

Variable	Somers, Cofer, Below, et al., (2002) All Students NPSAS:96			Somers, Cofer, Hoef, et al., (2002) All Students NPSAS:96			Langrehr (2003) NPSAS:96 First-Time Students BPS		
	White	African American	Hispanic	All	Male	Female	All	Adult	Trad- itional
Low GP A	-0.325	-.1970	-0.2280	-0.3013	-0.3183	-0.2907	-	-0.2479	-0.2758
High GP A	-0.092	-	0.1110	-0.0535	-0.0731	-0.0417	0.0460	-	-
No GPA	-0.0231	-.2140	-0.1580	-0.2306	-0.3036	-0.1882	-	-	-
Live On- Campus				-0.0882	-	0.0904	-0.0884	-	-
Work Full-Time				0.3267	0.3514	0.3142	-0.1065	-	-0.1171
Remedial		0.1500	0.1270	-	-	-	-	-	-
Sophomore	0.1390	0.1360	0.1660	0.1325	0.1609	0.1167	-	-	-
Junior				-	-	0.1240	-	-	-
Senior				-	0.0783	0.1579	-	-	-
Attend Full-Time	0.3310	0.3140	0.3600	-	0.3514	0.3142	0.0616	-	0.0618
Less than 2 year	0.0970	0.1920	-	0.0904	-	0.1204	-	-	-
Public	-0.1910	-	-	-0.1388	-0.0935	-	-	-	-
For Profit	-0.1300	-	-	-0.0766	-0.1557	-	-	-	-
Tuition	-0.00005	-.00005	-0.00005	-0.0000496	-0.0000498	-0.0000247	-0.04340	-0.0364	-0.0437
Grants	0.1025	0.1235	0.0953	0.0999	0.0856	0.1062	0.0664	0.0915	0.0552
Loans	0.0576	0.0335	0.0611	0.0515	0.0633	0.0467	0.0381	-	0.0347
Work Study	0.1380	0.1740	0.3380	0.1739	0.3300	0.1459	-	-	-

Table 1

Summary of Significant Delta – P Statistics for Two-Year Colleges

Variable	Somers, Cofer, Below, et al., (2002) All Students NPSAS:96			Somers, Cofer, Hoef, et al., (2002) All Students NPSAS:96			Langrehr (2003) NPSAS:96 First-Time Students BPS		
	White	African American	Hispanic	All	Male	Female	All	Adult	Trad- itional
High Debt			0.1700	-	-	-	-	-	-
Medium Debt	-	-	-	-	-0.0861	-	-	-	-
Low Debt			0.0770		-0.0530		-	-	-
Met with Friends	-	-	-	-	-	-	0.0462	0.0944	-
Met with Advisor	-	-	-	-	-	-	0.0526	-	-

Cofer and Somers (2000) examined the within-year persistence of students at two-year colleges using NPSAS:96. This included all two-year colleges, both public and private. The previous model from Cofer and Somers (1999) provided the framework for the analysis. There was a small and negative effect of tuition on persistence. All of the financial aid variables were significant and positively associated with persistence. It was concluded that the “increased availability of financial aid in all forms had mitigated the effect of rising tuition” (p. 802). Borrowing had similar but not identical influence on persistence compared to the earlier work of Cofer and Somers (1999). Debt was negatively associated with persistence at the low and middle levels of debt but positively associated at high levels of debt. Two-year students were more likely to assume larger debt levels than their four-year counterparts.

Cofer and Somers (2001) continued this line of research and extended it to a comparison of results between NPSAS:93 and NPSAS:96 to review differences over time. The results verified that measures of persistence changed over time. The demographic make-up of two-year college students changed between 1992 and 1995 such that in the 1996 survey “persisters were much more likely to be dependent, full-time students ... more likely to be over the age of 30, to be classified as a non-minority, and to be attending public institutions” (p. 69). The amount of grants and loans increased between 1992 and 1995 and remained ahead of inflation. Debt overall increased for each level of debt, reflecting an increase in the willingness of students to borrow. The influence of tuition decreased over the period, although it was still negative. Debt was significant and negatively associated with persistence at all levels in 1992, but only at the low- and moderate-levels of debt in 1995. There was a strong positive association between high levels of debt and persistence. The greater availability of financial aid was a beneficial influence on persistence. However, most of the new financial aid was in the form of loans, which had a negative effect on persistence for all but the highest level of debt burden.

Martin and Somers (2002) and Martin (2000) used the Beginning Postsecondary Students (BPS) subset of NPSAS:96 to investigate the within-year persistence of 1,814 first-time, first-year students at two-year colleges. The model was constructed based on the prior research of Somers and associates but was reconstructed using the BPS variable set. The results were that low-income students persisted at significantly lower rates than did students of middle- and high-income. Students with a GED were less likely to persist, which is similar to the Cofer and Somers (2000) findings, but dramatically different than

the St. John and Starkey (1994) results, in which there was a positive influence of a GED on persistence. Those with no GED or high school diploma were even less likely to persist. Students with a low GPA were 32.72 % less likely to persist than those with an average GPA. Full-time students were more likely to persist than part-time students and those who worked full-time were less likely to persist. The financial aid variables had effects that were much different for first-time, first-year students than when considering the entire population of two-year students. Tuition was significant and negative as it was in the previous research by Cofer and Somers (2000) but with a much higher effect size. Grants and loans both had a positive association on the within-year persistence of first time, first-year students.

Somers, et al., (2002b) applied the model to study within-year persistence in two-year colleges by gender. The authors recognized the tremendous growth in female participation in higher education and especially in two-year and less-than-two-year schools. NPSAS:96 was used to explore the association of financial aid and persistence of women in two-year colleges. The sample consisted of 5,455 men and 8,425 women enrolled in two-year and less than two-year colleges. [This is significantly different from the sample in the Cofer and Somers (2000) research, which did not include proprietary and less than two-year colleges and consequently had a smaller sample size.] Overall, African-American and non-Hispanic students were more likely to persist than whites. Dependent students were more likely to persist than independent students, and high-income students were more likely to persist than middle-income students. Low-income students were less likely to persist than either middle- or high-income students. Females and students under the age of 22 were less likely to persist. High aspirations, as measured

by aspiration to an advanced degree, were a significant predictor of persistence.

Sophomores were more likely to persist than freshmen, which is consistent with other prior research. Full-time students and students receiving remediation were also more likely to persist. The financial variables were all significant on the total sample with tuition having a slight negative association. Grants, loans and work-study were positively associated with persistence. This is somewhat contradictory to the Cofer and Somers (2000) analysis, where there was a negative association with low and middle levels of debt.

Broken down by gender, the results were somewhat different. Black males and Asian American females persisted at higher rates than whites. Men and women with high family incomes were more likely to persist than those of middle- and low-income. Low-income females were less likely to persist, but there was no significant relationship for men. Male students less than 29 years-of-age were more likely to persist than students in the 22-29 age-group, while with females, the effect was large and negative. Females with low test scores were more likely to persist, whereas males were less likely. Aspiration to an advanced degree was positive for males. Being a sophomore was a positive indicator for both men and women as was attending full-time. All of the college grade variables were significant and negatively associated with persistence, which is a different result from the Cofer and Somers (2000) research.

The price variables were mixed for males and females. All of the variables were significant, however there were some interesting differences when considering debt load. Tuition was negatively associated with persistence for both men and women, although the effect size is small for each group. Grants, loans and work-study were all positive for

men and women, although men were affected by work-study, grants, and loans in that order, while women responded better to grants, loans, and work-study. None of the debt load variables were significant for women, whereas men were negatively affected by low- and medium-levels of debt.

Langrehr (2003) used NPSAS:96 to examine the persistence of students in two-year colleges or less than two-year programs by ethnicity. Tuition increases had a significant but very small negative association with the persistence of African-American students, white students and Hispanic students. The receipt of grant aid increased persistence among African-American students by 12.4 %, white students at 10.3 %, and Hispanic students by 9.5 %. Loans increased the persistence of white students by 5.8 %, Hispanics by 6.1 % and African-Americans by 3.4 %, which indicated a greater reluctance of African-American students to borrow to meet their educational costs. Work-study had the greatest influence on Hispanic students with a 33.8 % point improvement in the likelihood of persistence. This was followed by African-American students at 17.4 % for each \$1,000 in funds received, and white students at 13.8 %. Work-study had the greatest likelihood of improving within-year persistence for all groups but was especially important for the non-white students. Accumulated debt was not significantly associated with African-American or white student persistence, but was significant for Hispanics. High (above \$7,000) and low (below \$3,000) accumulated debt increased persistence by 17.0 % and 7.7 % respectively for Hispanic students. Low accumulated debt was negatively associated with the persistence of white students (-1.3 %). The results clearly indicate differing responses to financial aid by different ethnic groups in two-year colleges. These results were different from the previous two-year research (Hippensteel,

et al., 1996; Kaltenbaugh, et al., 1999; St. John & Starkey, 1994) which indicated that aid was insufficient to promote persistence and that the Delta – p 's for the aid variables were significant and negative.

Somers, et al., (2002a) studied the within-year persistence of adult students in two-year colleges using a sample of 1,814 students from NPSAS:96. The sample was developed using only those students for which BPS climate variables were available. Overall, low-income students were 11.5 % less likely to persist than middle-income students and high-income students were 7.3 % more likely to persist than middle-income students. Tuition was significant and negative with a 4.3 % less likelihood of persistence for each \$1,000 of tuition charged. Grants were significant and positive as were loans. Work-study funds were not significant in contrast to the results of Cofer and Somers (2000) which included students from less than two-year programs and did not include the BPS climate variables.

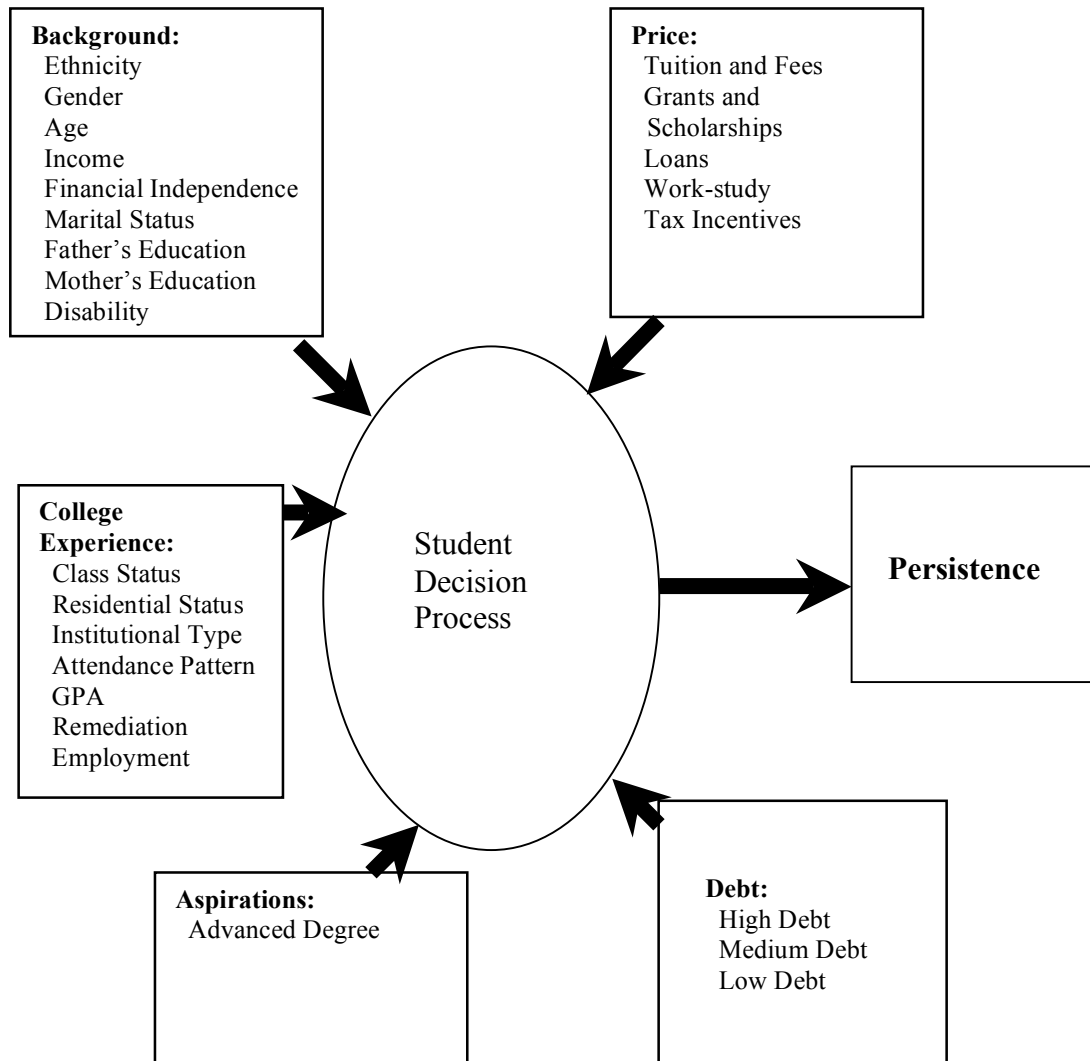
Income was not significant for adult students. Adult students were 3.6 % less likely to persist for each \$1,000 increase in tuition, 9.2 % more likely to persist for each \$1,000 in grant aid. Loans, work-study and accumulated debt, were not significant for this group of students.

High-income traditional-age students were 7.1 % points more likely to persist than middle-income students while low-income students were less likely to persist than middle-income students by 11.2 %. Tuition was negatively associated with the persistence of traditional-age students. These students were 4.4 % less likely to persist for each \$1,000 in tuition charged. Grants improved the likelihood of persistence by 5.5 %,

and loans by 3.5 % for each \$1,000 in loan aid. None of the accumulated debt variables were significant.

It is the intent of the current research to add to this body of knowledge by filling in one of the research gaps in persistence literature. Two-year colleges have generally been overlooked in the empirical research with the general exception of the work begun by Somers and associates. Little, if any, work provided an empirical look at student income and persistence in two-year college students. The Cofer (1998) study analyzed student income and within-year persistence at four-year schools between 1987 and 1996. It is the focus of this research to analyze low-income student persistence and financial aid in two-year public colleges between 1996 and 2000 (the most recent NPSAS surveys) and utilize the model developed by Cofer, Somers and associates to maintain uniformity of comparison through time. It does not include the BPS climate variables, which is both an asset and a limitation. It is well established that academic and social integration are critical components of persistence decisions and the relative lack of these variables in the NPSAS data sets limits the model. However, the inclusion of the BPS climate variables limits the sample size and may introduce a greater likelihood of Type I error. The BPS variables limit the sample to the inclusion of only first time, first-year students which may limit the ability to generalize to national financial aid policy.

Figure 1 Conceptual Model



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