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The relationship of involvement in college activities to persistence towards bachelor's degree completion in nursing

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The Relationship of Involvement in College Activities to Persistence Towards Bachelor's Degree Completion in Nursing

A dissertation submitted in partial satisfaction

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Doctor of Philosophy in Education

by

Kelley Ronay Ballard

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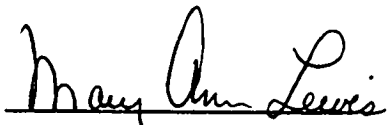

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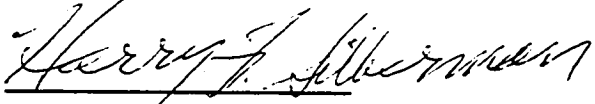

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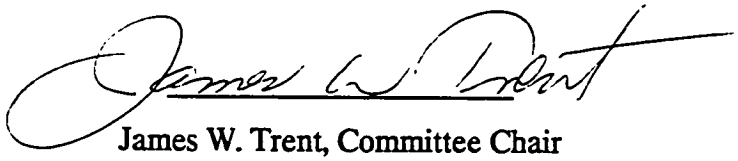

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ABSTRACT OF THE DISSERTATION

The Relationship of Involvement in College Activities to Persistence Towards Bachelor's Degree Completion in Nursing

by

Kelley Ronay Ballard
Doctor of Philosophy in Education
University of California, Los Angeles, 1993
Professor James W. Trent, Chair

Attrition from baccalaureate nursing programs has been cited at between 19 and 57%. College attrition has been associated with students' race, academic performance, and socioeconomic status (SES). Nursing students, generally, are among the more disadvantaged students in terms of academic performance and SES. Additionally, minority representation is increasing among nursing students.

From his study of attrition, Alexander Astin has documented a relationship between students' involvement in extracurricular and academic activities and their persistence in college. The involvement patterns of nursing students differ from those of many other students as they have a greater proportion of required courses and labs in their major and many of them work off-campus as nursing assistants. These activities distance them from other university students and activities but facilitate camaraderie, or a "nursing effect" among the students.

The study examined the relationship of involvement in college activities to persistence in the baccalaureate nursing program. Students majoring in primary education were chosen as a comparison group because they were presumed to be similar with respect to their academic performance, SES, and sex-role identity but lacked the increased course requirements in their major or "teacher effect."

The study comprised analyses of data drawn from 10,746 students who completed the 1985 Freshman Survey and 1989 Follow-Up Survey from the Cooperative Institutional Research Program. The 10,746 students comprised nursing, primary education, and other students -- 354, 537, and 9855, respectively. Contingency and multiple regression analyses were performed to determine academic, extracurricular, and environmental factors associated with persistence.

Contingency analyses revealed positive relationships between persistence and HSGPA, living in student housing, and hours spent in class, and negative relationships between persistence and part-time on-campus and full-time jobs. Among the best predictors were hours spent in class, hours spent working, and high school and college grades. Although most of the data yielded nominal findings, there was some evidence regarding the notion of the nursing effect. That is, there may be a positive effect from the time spent with other nursing students either in class or at work in a health care setting.

CHAPTER 1. THE PROBLEM

In 1986 the U.S. entered a period of nursing shortage from which it showed some signs of recovery in 1991-1992. The national vacancy rate for nursing positions in hospitals was 12.7% in 1989 and declined to 11% in 1990 (AHA, 1992a). The nursing shortage has gone into a temporary state of recovery. Complicating the recovery are the types of nurses most needed -- those who have bachelor's, master's, and doctoral degrees. Virtually every segment of health care requiring more nurses has been requiring more highly educated nurses (Conway-Welch, 1988). Preparation for bachelor's and master's degrees requires additional years of education, making this aspect of the shortage a problem that will take longer to resolve.

One step toward resolving the nursing shortage is to recruit more students to enroll in baccalaureate nursing programs. However, the poor image of nursing is a major obstacle to recruitment. High school seniors are choosing other majors over nursing. When students do choose nursing, failure to complete their nursing degrees further exacerbates the shortage. Although the degree completion rate has been found to be better for baccalaureate students of nursing than for many other majors (Astin, 1977), somewhere between 19 and 57 of every 100 students who begin a baccalaureate education in nursing do not finish their degrees (Benda, 1991; Hutcheson, 1979; Knopke, 1979; Munro, 1980; Rosenfeld, 1988).

College attrition has been found to be associated with students' race, academic abilities and socioeconomic status (SES). Nursing students, generally, are more disadvantaged than other students in terms of academic performance and SES (Green, 1987; Williams, 1988). Additionally, minority representation is increasing among nursing students. Between 1978 and 1988, minority enrollments increased as

follows: Blacks, 5.8% to 10.3%; Hispanics, 1.4% to 2.7%; and Asians, 1.2% to 2.2% (National League for Nursing [NLN], 1989). In general, minority students have lower high school grade point averages (HSGPAs) and come from lower socioeconomic backgrounds (Green, 1987; Williams, 1988). The distinct disadvantage that nursing students suffer, with regard to these factors traditionally associated with attrition, will be further substantiated in the review of the literature.

In addition to those variables previously identified with attrition, Alexander Astin has documented a positive relationship between students' level of involvement in their college experiences and their persistence in college. Student involvement refers to the amount of physical and psychological energy that the student devotes to any aspect of the academic/college experience. In Preventing Students From Dropping Out, Astin (1975) reported that involvement in both extracurricular and academic activities contributes to students' decisions either to drop out or to persist. A major focus of this study is to examine the effect of involvement in college activities on persistence for baccalaureate nursing students as compared with other students. Given the small number of males in nursing, only women were included in this study.

Studying Involvement and Persistence for Baccalaureate Nursing Students

In considering the relationship between involvement and persistence for baccalaureate nursing students, it must be noted that college involvement patterns for nursing students are different from the involvement patterns for most other college students (a review of this literature will follow in a later section). A greater proportion of nursing students, compared to other students, are married or anticipate marrying while in college, live off-campus and work off-campus (Ballard, 1990a; Green, 1987). These factors, which might "distance" nursing students from

mainstream campus activities, may limit their opportunities for involvement with other students and college life; however, this has been debated in the literature (Allen, 1988).

Given the disadvantaged standings of nursing students in academic performance, SES, race, and the distancing factors, one would assume that persistence rates for nursing students would be quite low. However, as previously stated, the persistence rate for baccalaureate students of nursing is better than for most other majors.

The effects of factors which negatively affect persistence may be counteracted by a special kind of involvement that occurs among nursing students, quite separate from mainstream college activities. Nursing students spend more time in lecture and laboratory classes together, apart from other students (Anderson & Schmidt, 1984). In some respects they have greater academic involvement than do many other students. They not only spend more hours per semester in classes and in clinical experiences together, but the experiences they share are more challenging and emotionally demanding than the experiences shared by students in other majors. Sharing these extra hours and experiences may create a special bond or nursing effect. This nursing effect may act as an involvement factor and positively influence persistence in the same way as other involvement factors identified by Astin.

Baccalaureate students of primary education are remarkably similar to students of nursing with respect to their academic abilities, SES, life goals, self-reported personal traits, and patterns of sex-role identity and autonomy (Ballard, 1990a and 1991; and Boughn, 1988). Yet, while there are similarities between nursing and education students with respect to background and personal factors, the curriculum for primary education does not have the intensity of the nursing

curriculum. Therefore, comparing students of primary education with students of nursing adds an element of "control" to this study. It also allows for additional understanding of the involvement patterns distinctive to baccalaureate nursing students and more distinct testing of the nursing effect.

Of students who defected from nursing to another major and career, 20% were found to defect to an alternative career in the health professions. Of those students who traveled the opposite road -- beginning in another major and career group and subsequently defecting into nursing -- 29% were from another career in the health professions (Ballard, 1990b). "Health professionals" was chosen as an additional group for selected analyses to discover whether there are variables predictive of movement between the two career groups. "Health professionals" includes occupational, speech and physical therapists, pharmacists, laboratory technologists and medical technicians.

Purpose of the Study

There were three broad purposes of this study. The foremost purpose was to identify factors that affect attrition for baccalaureate nursing students. Factors that have been traditionally identified as related to attrition were investigated. Of most interest was whether involvement in the college experience (extracurricular and academic activities) positively influenced nursing students to persist towards or earn the bachelor's degree in nursing, and how this involvement occurred. In order to explore this phenomenon, several other relationships were examined. The involvement patterns of nursing students were analyzed and contrasted with those of students of primary education and all other students. Within that analysis, the influence of distancing variables and the nursing effect on persistence were explored.

A second purpose of this study was to refine Astin's theoretical framework by examining the relationship between involvement activities and persistence for the specific populations of baccalaureate students of nursing, as well as primary education and all other students.

The third purpose of this study was to determine whether common denominators exist among nursing students who (a) persist towards a bachelor's degree but switch to another career choice, and (b) persist in nursing. Findings related to all of these purposes are presented in the following chapters.

In sum, the objective of this study was to clarify the factors that determine whether a college freshman who desires to obtain a bachelor's degree in nursing realizes her goal. More specifically, the objective was to assess the extent to which those factors were (a) traditionally associated with persistence, (b) related to the involvement theory of persistence, (c) similar to factors that were significant for other college students or unique to baccalaureate students of nursing.

General Research Hypotheses

The hypotheses underlying the proposed study were derived from both the purpose of the study and the theoretical framework. The principle hypothesis of the study was that baccalaureate nursing students who become more involved in college activities persist toward their degree more than those who do not become very involved.

In respect to the general hypothesis, several expectations follow:

1. Nursing students and students of primary education (compared to others) have lesser academic abilities, come from lower socioeconomic backgrounds, and have a greater representation of minorities. Those factors would be negatively related to their persistence.

2. The distancing factors (working off-campus, living off-campus and/or being married) will be negatively related to persistence for all groups because these activities tend to separate students from involvement in extracurricular and other college activities. These variables would have a greater impact on persistence for students of nursing because more nursing students experience such distancing factors.
3. The persistence of nursing students would be facilitated by the nursing effect, as previously described, which compensates for factors that often contribute to attrition.

The review of the literature and the methodology for the study held implications which led to the development of more specific hypotheses. These hypotheses will be listed following the review of the literature.

Definition of Terms

Student Career Groups

Students were surveyed with questionnaires at the beginning of their freshman year (1985) and returned follow-up questionnaires sent to them during the summer, four years later (1989). Students identified their career groups by marking on the 1985 Student Information Form their desired careers and matching majors. Whether the students persisted in their original career choices was determined by their responses to present career choices and final college majors on the 1989 Follow-Up Survey.

Persistence Towards Degree

In this study, the dependent variable, persistence, is defined as achievement of the bachelor's degree in the originally chosen career. Persistence was operationalized with three different levels. The information used for placing

students into the three levels came from their responses on the 1989 Follow-Up Survey.

GRADUATE: a student who reported on the FUS that she had completed the bachelor's degree within the 4-year period from 1985 to 1989 and that she was maintaining her original career choice.

PERSISTER: a student who reported on the FUS that she had not yet earned the bachelor's degree but planned to continue with enrollment for Fall 1989, in the career originally chosen in 1985.

DEFECTOR: a student who either 1) had not earned the bachelors degree and had no plans to enroll in 1989, or, 2) had changed her choice of career.

These levels were chosen for persistence because the study sought to discover factors related to the retention of students in their baccalaureate nursing programs. The group of "defectors" from nursing were further analyzed to gain information about this important group of students lost to nursing. The "persister" category was used because the proportion of students requiring more than 4 years to complete a bachelor's degree is increasing to greater than 50% (see discussion in the review of the literature).

Involvement Activities

The involvement activities are categorized into two groups:

ACADEMIC: classroom, laboratory, and other academic activities.

SOCIAL: school-related and social activities that are not academic in nature.

Distancing Factors

The distancing factors (those factors which might limit students' opportunities for participation in the academic and extracurricular activities) were categorized into three groups:

MARITAL STATUS: married vs. not married.

TYPE OF RESIDENCE: student vs. non-student housing and the number of hours spent commuting to campus.

WORKING: part-time on campus, part-time off campus, or full-time while going to school, and the number of hours spent working per week.

An Outline of the Remainder of the Study

The review of the literature which follows in Chapter 2 will focus on a discussion of factors related to persistence for all students and for baccalaureate nursing students. The involvement theory of persistence will be discussed in detail, as will characteristics of nursing students that influence them to have involvement patterns different from those of their college peers.

Chapter 3 will outline the research design, methodology and instrumentation. Chapter 4 profiles each student group and examines the likeness of students of nursing and education. Chapters 5 through 8 contain the results of contingency analyses done to discover relationships between the independent variables and persistence for each student group. Findings related to multivariate analysis appear in Chapter 9. The final chapter offers a general summary of the findings and a discussion of the implications the findings have for administrators of nursing programs, as well as recommendations for future research.

CHAPTER 2. REVIEW OF THE LITERATURE

The literature review is arranged in three segments. Segment I provides more detail and documentation of the factors that have contributed to the current supply and demand for registered nurses. The rate of attrition from baccalaureate nursing programs is reviewed. Segment II reviews background characteristics of incoming freshmen and other factors that contribute to their failure to attain the degree.

In Segment III, Astin's theoretical framework of involvement is discussed in detail. Astin's study, as well as others which have looked at the effects of involvement on persistence for nursing students, are reviewed. They provide a basis for the research design. The typical baccalaureate nursing curriculum is discussed, because its influence on involvement patterns for nursing students was investigated in this study.

The Problem

The 1986-1991 Nursing Shortage

Magnitude and Factors Contributing to the Shortage

In 1977 there were about 1.4 million registered nurses (RNs). Twelve years later, in 1989, there were over 2 million individuals with registered nurses' licenses (U.S.D.H.H.S., 1990). The growth in supply is partly due to nursing school graduations. In addition, more RNs have been working for consistently more years than before. Contemporary RNs are more likely to continue working throughout their childbearing years. The National League for Nursing surveyed 53,808 nurses 1 year after they passed their registered nurse licensure exams and found that 97% of them were practicing nursing (Rosenfeld, 1989). This represented a labor force participation rate higher than most job categories dominated by women (Marriner-

Tomey, 1990). Yet, despite the increase in the number of RNs, in 1992 the U.S. is recovering from a serious shortage of nurses. The future availability of an adequate supply of nurses who are educationally prepared to meet the health care demands of the nation is uncertain.

Analysis of the supply-demand dynamics involved in the 1986-1991 shortage reveals an increased number of employed RNs since 1984 (McKibbin, 1990). Simultaneously, there was a substantial decline in the number of hospital inpatient days. This would seem to suggest an over supply of RNs, but instead the demand for RNs outstripped the increased supply. Several factors combined to create an actual shortage of RNs.

Changes in the nation's reimbursement system for health care expenditures resulted in a decrease in the number of hospital inpatient days. The Medicare and Medicaid prospective payment system, which pays a fixed fee for each admission (although there is some variation regionally), in recent years placed many hospitals under increasing financial pressures. Fewer hospital days are reimbursed, so patients who are less ill and do not absolutely require hospital care are discharged sooner and are taken care of on an outpatient basis. This results in a situation of increased acuity (degree of illness) of those patients who are left hospitalized. These patients legitimately require more hours of nursing care per patient (Lind, 1988). While 30,000 short-term, general hospital beds were closed between 1980 and 1987, nearly 20,000 beds were converted to intensive care beds. As a result, in 1988 nearly 90,000 intensive care beds constituted close to 10% of all beds (Roberts, et al., 1989).

Advances in technology and medical care are also responsible for the increased requirement for intensive care beds and RNs per patient day. There has been a significant increase in the utilization of very sophisticated and ambitious

surgeries (such as organ transplants) and in the use of advanced life support and monitoring equipment (Roberts, 1989).

An aging population and AIDS have increased the need for nurses working in nursing homes, skilled nursing facilities and hospices as well as in hospitals. The number of people 85 years old and older was 2.2 million in 1980 and is expected to reach 4.9 million in the year 2000 (Roberts, 1989). Currently patients 65 years old and older use greater than 50% of all hospital beds. It has been estimated that by the year 2000 there will be 10 times as many patients diagnosed with AIDS requiring care as in 1989 (AHA, 1992b). The AIDS population is also an especially heavy user of hospital care.

Two factors especially contribute to the increased use of home health care outpatient clinic visits. The growing populations of the aged and AIDS patients are one factor. A second factor is the push to cut down on the high cost of in-patient hospital days by providing more care in the home and in outpatient clinics. From 1980 to 1987, the number of Medicare home health visits increased 52% (U.S.D.H.H.S., 1988). Although home health visits reduce the need for hospital nursing services, the in-home work also involves nursing services.

The wide variety of specialties and sectors for which nurses are required stresses the supply. For example, with the current popular emphasis on healthy lifestyles, some nurses are drawn to employment in corporate or community health-promotion programs. A 1989 report by the American Nurses Association (McKibbin, 1990) cited nursing shortages of 18.9% in nursing homes, 12.9% in home health agencies, 10.5% in health maintenance organizations, and 12.7% in hospitals (the highest reported job vacancy rate in 20 years).

The substitution of registered nurses for licensed practical nurses, aides, administrators, and other patient services personnel was a contributing factor to the

shortage of RNs as well. Low RN compensation levels relative to those of other personnel encouraged employers' inappropriate utilization of RNs carrying out non-RN functions (Aiken, 1989, and U.S.D.H.H.S., 1988). In light of the growing use and complexity of medical technology and the rising acuity of hospitalized patients, leaders of organized nursing went along with the substitution in order to gain a more highly educated worker to provide optimal patient care. Substitution of RNs for other personnel also made it possible for administrators to make fewer manipulations to obtain a level/mix of personnel to provide for all of the patients' needs.

With a surplus of nurses in the early 1980s, many nursing leaders were advocating some form of "primary care" -- total care of each patient by one RN per shift. Rather than delegating nursing assistants or LVNs to perform the patient care duties that do not require the expertise of the RN, the RN provided all of the patient care herself (Marquis and Huston, 1992). While primary care was thought to be a means of providing more continuity and quality patient care, it also justified greater utilization of the oversupply of RNs during that period (Curran, 1989).

All of these factors contributed to the utilization of registered nurses almost doubling from 50 RNs per 100 patients in 1972 (Selby, 1990) to 98 RNs per 100 patients in 1987 (AHA, 1988). The described pattern of utilization of nurses created a situation where demand consistently outstripped supply in acute care as well as in other sectors of the health delivery system (NLN, 1991).

Signs of Recovery from the Shortage

There have been signs in the past year that suggest the acute phase of this nursing shortage is resolving. The registered nurse vacancy rates in hospitals declined from 12.7% in 1989 to 11% in 1990 (AHA, 1992a). However, overtime for RNs increased 7%, which seems to indicate that overtime was compensating to

some degree for positions that might be considered vacant. It is interesting to note that overtime for licensed practical nurses and nurse aides decreased 10% and 31%, respectively (McMurtry, 1992). This is consistent with the thesis that hospitals require RNs in labor-intensive areas where increased patient acuity requires advanced nursing skills.

Other factors that are contributing to a decreased RN vacancy rate (i.e., shortage) are hospital mergers, a decrease in the number of staffed hospital beds (McMurtry, 1992), the use of nurse extenders to provide care not requiring the expertise of an RN, and recessionary times causing hospitals to use fewer nurses even while expanding services. An additional factor that has softened the shortage has been an influx of nurses who had not been practicing nursing, or who had changed from working part-time to working full-time to increase family earnings during recessionary times (Gray, 1992). Many hospitals in California experienced decreases in job vacancy rates of 30% to 60% in 1992 (Gray, 1992).

Although the 1986-1991 shortage of RNs may be easing, other shortages are surfacing or are predicted. Nurses with bachelor's and master's degrees are, and will continue to be, in particularly high demand. Virtually every segment of health care that is requiring more nurses is requiring more highly-educated nurses (Conway-Welch, 1988). The demand for RNs with master's degrees and doctorates is estimated to be more than twice the growing supply through the year 2000 (Marriner-Tomey, 1990). Bachelor's and master's degree preparation requires additional years of education, which means this aspect of the shortage will take longer to resolve. Bachelor's, master's, and PhD nurses are needed to work as nursing educators (Mullinix, 1990). The 1988 National Sample Survey of Registered Nurses (USDHHS, 1990) reported 40,311 nurses (2.7%) actively employed as nurse educators in 1984, compared with 30,005 (1.8%) in 1988. This represents a 30%

decline. More nursing educators will be needed as enrollments in nursing programs are currently increasing (NLN, 1991).

Some nursing specialties, because of shortage issues specific to the specialties, are experiencing a continuation of the nursing shortage. Obstetrical nursing is experiencing a shortage due to the retirement of senior nurses (a large percentage of whom are in OB), new job opportunities for OB nurses (home care) and a lack of interest among new graduates who were given the opportunity to move directly into other specialties (Hall-Johnson, 1990). To illustrate the dynamics of the recent and specialty-specific continuing shortages, in the late 1980s there was a severe shortage of critical care nurses. It became necessary to allow new graduates to enter nursing in the critical care specialty. Preceptorship (mentoring) programs and programs designed specially for newly graduated RNs were developed to provide training in the critical care areas. New graduates lost interest in obstetrics in favor of critical care, which was higher paying, and, in their perceptions, more exciting and glamorous. Yet it had not been many years since the Obstetrics specialty had itself opened to new graduates.

Preceptorship programs were implemented for many specialties to attract and prepare new graduate nurses. In November, 1990 the American Hospital Association conducted a pilot study of 100 randomly-selected hospitals from across the U.S. (AHA, 1991). The hospitals' chief nursing executives were surveyed on their use of five educational programs designed to improve nursing skills. Preceptorships for new RNs were evaluated the highest for their contribution to improving nurse skill. Preceptorships were reported most frequently for implementation in the next two years. As new graduates flock to preceptorships in the specialty areas, there are now more positions available in the medical-surgical areas of many hospitals. Specialty preceptorship programs helped resolve the

shortage, although, as mentioned, there are current and predicted shortages in some specialty areas.

Although there is currently a dip in vacancy rates, an AHA report, Health Care 2000: A World of Human Resource Differences (1992b) projects a return to a serious 12% vacancy rate for the year 2000. The report advises:

> Given the current economic recession nationwide, many employers have seen a decrease in chronic labor shortages and multifold increases in applicants for all positions. If, in light of the rising unemployment, you feel that the work force diversity issue is no longer relevant, then a closer look at the issues may convince you otherwise. If you are responsible for managing the health care industry, you should realize that the spiking unemployment in 1991 will soon reverse itself. Regardless of the rise and fall of national unemployment levels, the structural unemployment in health care, i.e., the shortage of skilled, licensed, or certified people, will continue indefinitely. According to Ronald Hawkins, writing in the January 1991 issue of HRNews: "The current increase in available workers may be sending a false signal to personnel managers and other top executives. It is a false sense of security. When it goes away, the demographics are going to bite even harder. We have a fundamental, long-term problem."

Admissions and Graduations from Baccalaureate Nursing Programs

Increasing recruitment into baccalaureate nursing programs is one way of increasing the supply of more educated nurses. Horns and associates (1990) studied 102 randomly-selected NLN accredited baccalaureate programs and found that recruitment efforts were a major activity and that 84% of the programs reported an escalation of recruitment activities during the last 3 years. These recruitment efforts are paying off and are partly responsible for resolution of the shortage.

Between 1984 and 1985 there was a 13.3% decrease in admissions (from 39,573 to 34,310) to basic baccalaureate programs (for students who have no

previous education in an associate degree or diploma RN program). The following year there was an additional 18.3% decline. Admissions to basic baccalaureate nursing programs had declined 31.6% over 2 years (NLN, 1991). This decline was a major factor in creating both the shortage and the alarm over expected continued declines in admissions. Media attention during the shortage made consumers of health care more aware of the value of nurses. As the shortage progressed and the supply-demand imbalance grew, salaries for nurses inevitably increased. In some parts of the country where local economies were in trouble, people entered nursing for job security, better salaries and benefits.

In 1987 there was a 1.7% increase in admissions to basic baccalaureate programs and in 1989 there was a further 1.9% increase. Admissions to associate degree and diploma programs experienced larger increases of 11.5% and 19.3%, respectively. Overall, the increase in annual admissions of all new, first-time nursing students increased almost 9.3% in the 1988-89 academic year (NLN, 1991). The factors that fuel the demand for RNs in general also necessitate the need for better-educated RNs capable of performing those sophisticated and complex activities associated with decision making, independent practice, management and patient education. It is germane that the numbers of baccalaureate admissions increase and outstrip those of the associate degree and diploma programs. Additionally, it might be anticipated that the number of graduates will increase as a result of the increase in admissions.

A major obstacle to the recruitment of academically able students into baccalaureate programs of nursing is the poor image of nursing. Although the numbers of admissions are increasing, a greater percentage of the more academically prepared students are choosing other careers. Lynaugh and Fagin (1988) come to the point: "The mission of nursing, giving care, is undervalued in our

society." They add that nursing has its origins in unpaid domestic work and also has powerful historic links with religiously inspired human services. High school seniors are aware that neither domestic service nor the religious sisterhoods are routes to individuals' financial success and prestige. Working Woman (McCandless, 1988) named nursing as one of the 10 worst careers for women, citing low prestige as one of the reasons.

Using a national sample of first-time, full-time freshmen, the UCLA Higher Education Research Institute (Astin, et al., 1987) found that in 1977 8.8% of female students chose nursing as a career. Nursing was the most popular career choice for women. By 1988 the percentage had dropped to 4.4% (Astin, et al., 1988). The 1989 percentage showed a modest increase (supporting NLN data) of 0.4% to 4.8% (Astin, et al., 1989). However, the most popular career choice in 1989 was business executive, which captured 9.9% of first-time, full-time female college students. Although admissions have increased, there are serious ramifications for the proportionately larger numbers of academically "at risk" students entering baccalaureate nursing programs.

Attrition Contributes to the Shortage

Students of nursing who change majors or fail to obtain their degrees contribute to the shortage of nurses and the cost of education. The literature was reviewed for articles citing retention rates for baccalaureate schools of nursing. Two studies involved single institutions and one study involved nine programs located in two midwestern states. Hutcheson and associates (1979) studied 261 students enrolled in the Woodruff School of Nursing at Emory University between 1968 and 1972. Of these students, 80% (52) completed the nursing school program with their respective classes. Knopke (1979) evaluated attrition following reorganization of the baccalaureate curriculum at the University of Wisconsin-Madison School of

Nursing, and found an average yearly student attrition of 19% of the total enrollment. This would average to a 57% attrition rate for each freshman cohort of students.

Benda (1991) sampled basic bachelor's degree students in three public and six private nursing programs in two midwestern states. The retention rate was calculated across class levels. The retention rate overall was 76.1% (82.4% of 188 freshmen, 95% of 141 sophomores, and 92.5% of 236 juniors). These three studies found greatly different retention rates of 43% to 80%

The National League for Nursing is one of three sources for national retention data. The NLN looked at retention rates by analyzing class-by-class enrollment data from their 1985-86 annual survey. The NLN compared national enrollments of baccalaureate nursing students from one class to the next class and combined the retention rates for all four sets (freshman through senior) of classes to arrive at an overall retention rate (Rosenfeld, 1988). Eighty-three percent (266) of the NLN accredited programs responded with complete data. For the 4-year baccalaureate nursing programs, a 75% retention rate was calculated.

This NLN-reported retention rate is problematic in that it is base on cross-sectional data and does not measure the retention rate of each year's entering cohort of baccalaureate nursing students. The number of freshman students enrolled was compared with the number of sophomore students enrolled. Given the hypothetical situation of 100 enrolled freshmen, if 20 dropped out and 20 switched from another major into nursing, the NLN would calculate a 100% retention rate. The retention rate for the freshmen who were initially enrolled would, figured correctly, only be 80%. The number of defectors and recruits were not figured directly into the equation. In this hypothetical situation there is a 20% error for 1 year for which retention must be considered. The NLN retention rate is optimistic.

There are only two other sources of national data available with which to validate the NLN retention rate. Astin (1977) used the 1969-1974 Cooperative Institutional Research Program (CIRP) Follow-Up Survey to study the attainment of career objectives of freshmen students planning to become nurses. The CIRP data were based on a national, longitudinal sample. The criteria for inclusion in the sample were first-time, full-time students desiring nursing careers and bachelor's or higher degrees, who rated the goal of helping others as essential or very important, and who estimated their chances of changing career goals as less than very good. Astin found that 69% of these students who planned to become nurses achieved their objectives.

The third study that used a national longitudinal sample was done by Munro (1980) using a sample of students drawn from the National Longitudinal Study of the High School Class of 1972 (stratified, two-stage probability sample of all schools in the 50 states and the District of Columbia). Included in the sample were 234 subjects who entered baccalaureate programs in nursing on a full-time basis in Fall 1972. Follow-up data were collected in three waves over a period of 5 years. Of these students, 41% withdrew from their nursing programs during the study, yielding a 59% retention rate.

Following a review of the reported retention rates from the national samples (Astin, Munro and the NLN) it becomes evident that these retention rates are greatly lower than the retention rates of the schools which did not represent national rates. Additionally, the rates reported by Astin and Munro (69% and 59%, respectively) are perhaps the most accurate rates because they are based on national longitudinal studies, which should better represent the population of baccalaureate nursing students.

Although there is less attrition from nursing than from most other baccalaureate majors (Rosenfeld, 1988), an attrition rate of 20% to 57% reflects a loss of somewhere between 6,300 and 28,000 newly graduated nurses for 1988 alone. Even more troubling, the NLN tables of student admissions and graduates over the past several years reveal a decrease in graduates greater than the decrease in admissions 4 years earlier. Using the NLN tables that display the numbers of student admissions and graduates over the past 20 years (NLN, 1991), there appears to have been a 31% non-completion rate in 1984-85 versus a 45% non-completion rate in 1988-89. This represents a 15% increase in non-completion between 1985 and 1989. Attrition from baccalaureate nursing programs is a serious contributor to the deficit of nurses in the United States.

It is alarming that the attrition rate may actually be increasing for nursing students, as it has been shown to be increasing for students entering 4-year colleges and universities (Astin, 1987). The cost of attrition to the school, as well as to the student, makes it imperative to uncover the causes of attrition among students being admitted to baccalaureate programs in the 1990s.

Nursing Students and Attrition

Characteristics of Freshman Baccalaureate Nursing Students

Degree attainment for nursing students is related to many characteristics traditionally associated with degree attainment for all students. Unfortunately for nursing students, their lower SES, poor academic histories, more traditional sex-role identities, and increasing proportion of minority representation (which involves factors that are negatively related to persistence) put them at a disadvantage for persistence in college. This section will review studies that cite the characteristics that set apart nursing students, as a group, from many other students. A later

section will explore the effect these characteristics have on degree attainment for the baccalaureate nursing student.

Williams (1988) examined trends in academic achievement, SES, personal attributes, and values of first-time, full-time college freshmen aspiring to nursing careers. Williams used national data from the annual American Freshman Survey administered by the Cooperative Institutional Research Program (CIRP). The basic survey instrument, the Student Information Form (SIF), is administered in the beginning of the freshman year, usually during orientation. The SIF provides a wide range of demographic data as well as information on the students' high school backgrounds, career plans, educational experiences, aspirations, financial statuses, attitudes, and values. Survey results are typically weighted to correct for non-response bias and sampling errors to compute national norms.

Williams selected from the CIRP data bank a random sample of 500 students from each of the 42 career groups specified in the SIF as career options. The cohorts were sampled from the database intermittently from several of the years between 1966 and 1987. These cohorts were used to compare the nursing career group profile with the profiles of non-nursing career groups.

In terms of academic achievement, the great majority of students attracted to nursing in 1982 were students with average ability who achieved B- or B+ HSGPAs. Of the 42 CIRP career groups, nursing ranked 30th in high school grades. The SES data used three measures: income of the student's parents, father's level of education, and mother's level of education. Out of the 42 careers, nursing ranked 37th in all three measures of SES.

The great majority of students who indicated nursing as their career choice in 1966 were White (91.1%). Blacks represented 3.2%, and Chicanos, 0.2% (1972).

By 1987, 81.1% were White, 13.6% were Black, and 1.2% were Chicano. The representation of all minority groups continually increased from 1966.

Green (1987) also used 1986 CIRP data to compare the nursing group to national norms (rather than ranking relative to 42 other career groups). Green investigated a number of characteristics that had been studied by Williams. Most of Green's findings were consistent with Williams'. For example, in Fall 1986 almost one-third more non-nurses than nurses reported having A/A- HSGPAs. Nurses reported lower degree aspirations than their peers. Fifty-one percent of the nurses aspired to only the bachelor's degree, compared to 32.4% of the non-nurses. Nurses came from lower income families in greater proportion than their peers. Prospective nurses came from families with incomes under $10,000 over 50% more often than did non-nurses.

The orientation of the sex-role identities of nursing students also appears to set them apart from their non-nursing peers. Loo (1983) studied 100 first-year female nursing students (whether they were baccalaureate students was not specified) to determine their attitudes toward women's roles in society. The students voluntarily completed the Attitudes Toward Women Scale and were found to have more conservative scores than did the non-nursing female undergraduates reported by Loo and Logan in a previous study. Green (1987) found that 33% of prospective nurses anticipated getting married either during college or 1 year after college graduation, versus only 26% of non-nursing students who had similar expectations.

High school grades, SES, more traditional sex-role identities, and race are characteristics that will be investigated to validate whether they indeed differ for nursing students as compared with their non-nursing peers.

Studies of Persistence Among Baccalaureate Nursing Students

To what extent do these characteristics influence degree attainment for baccalaureate students of nursing? Astin (1982), using the 1969-1974 CIRP four-year follow-up survey, studied the attainment of career objectives of freshmen students planning to become nurses. High school grades carried a substantial positive weight (partial r = .23), but that weight disappeared when students who failed to complete the bachelor's degree were excluded. Therefore, high school grades appeared to be crucial in increasing a student's chances for completing a bachelor's degree. Negative weights were associated with plans to change major fields of study, and with being Black.

The relationship of race to persistence is becoming more important because the representation of minorities in nursing schools is increasing (as discussed previously). According to a combined measure of the 1976 National Longitudinal Survey and the 1973-1979 Current Population Survey cited in Astin (1982), 59% of White freshmen, 42% of Black freshmen, 31% of Chicanos, and 31% of Puerto Ricans eventually receive the bachelor's degrees they set out to attain. Membership in a minority race is negatively associated with persistence for nursing students.

While most other researchers identified college grades as influential in degree attainment for nursing students, it is interesting that nursing was the only one of the 10 careers Astin analyzed in which attainment of the objective was not related to undergraduate GPA. As long as they completed college, students were equally likely to go into nursing regardless of their undergraduate grades. However, Allen and co-workers (1988) had findings that contradicted those of Astin. They found that both nursing and non-nursing grades were strong predictors of program completion.

Dunkelberger & Aadland (1984) used the National Longitudinal Study (NLS) of the high school class of 1972 to study the respective persistence rates of three groups based on career interest in nursing and ultimate occupation attainment: (a) those who expected to become nurses when in high school and did so; (b) those who expected to become nurses in high school but did not; and (c) those who had other occupational expectations in high school but became nurses. The study did not specify the types of degrees attained, only that the students earned Registered Nurse licenses and began work as nurses.

The 1972 NLS sample identified 601 respondents who planned to become nurses. Of these, 207 achieved nursing credentials. The chi-square statistic was used to determine the significance of the relationship of background variables to the respondents in the three recruitment types. High school students who planned to become nurses but had failed to achieve their goal within 7 years were much more likely to be from low SES backgrounds than were those in the other two groups. The group that planned to, and did, become nurses had the highest aptitudes; the group that had not planned to, but did, become nurses had medium aptitudes; and the group that planned to become nurses but who failed to do so were of lower aptitude. Significantly more non-Whites were found among youth in this last group. Nearly 38% of the youth in this group were nonwhite, compared to only 11% of those who planned to, and did, become nurses and 17% of those who did not plan to, but did, become nurses.

In addition to the contingency analyses, multivariate analysis was also applied to determine the independent and aggregate effects of the variables in differentiating the three recruitment topologies. The group that planned to but did not become nurses was differentiated by two factors: members had the lowest

aptitude of the three groups, and many more non-White were included in this group than in the two other groups whose members became nurses.

Those who planned to and became nurses differed most in aptitude; their aptitude was the highest among the three groups. This group was disproportionately comprised of Whites. Those youth who did not plan to, but did, become nurses were not differentiated by any of the four descriptive variables -- SES, race, size of home-town community, or aptitude.

Dunkelberger and Aadland suggest that a major finding of their study was that SES was not a significant differentiator among the three groups in multivariate analysis, whereas in the contingency analysis it was highly significant. They suggest that much of the impact of SES is shared with other variables -- in particular, aptitude and race. However, they do not show the step-by-step changes of the beta coefficients, which would have provided the information necessary to evaluate their conclusion.

Munro (1977) used the same NLS data to perform path analysis to test a theoretical model of college nursing student dropouts. Munro's findings reflected those of Dunkelberger and Aadland, confirming a lack of relationship between SES, aptitude, and dropping out.

Alichnie and Bellucci (1981) conducted a study of freshmen nursing students (1975 and 1976) at Wilkes College in Wilkes-Barre, PA, to determine cognitive and non-cognitive variables which best predicted withdrawal from the nursing program at the conclusion of the freshman year. Students' participation was voluntary. The 1975-76 class had a sample of 99 and the 1976-77 class had a sample of 93. The 1975-76 class was the criterion group and the 1976-77 class was the cross-validation group. The tests used were administered in the beginning of both freshman years and included the following: the Aptitude Test for Nursing; the Otis-Lennon Mental

Ability Test; two sub-tests (paragraph meaning and word meaning) of the Multiple Aptitude Test; mathematics and arithmetic formulation sub-tests of the Gordon's Survey of Values; and the six tests of Gordon's Survey of Interpersonal Values. High school rank (HSR), SAT scores, and college GPA for science and nursing courses were obtained from the students' college records.

Step-wise multiple regression analysis was used to determine which variables were predictive of dropping out during or following the freshman year. In comparing results of the two classes, nursing and science GPAs were significantly related to dropping out from nursing in both classes. The remaining variables did not hold under cross-validation.

Knopke (1979) conducted a study to evaluate nursing student attrition following reorganization of the baccalaureate curriculum at the University of Wisconsin-Madison. A prediction model that would identify students as potentially successful or unsuccessful in the school evolved from use of the discriminant analysis technique. The use of the technique allowed for the maximal discrimination between two groups of students -- dropouts and continuing -- from the first 3 years of the new program. Student measures used as the independent variables to predict group membership included: first semester GPA; high school percentile rank in class; the College Qualification Test (CQT) "Science" subpart; the learning style score (a numerical index representing a continuum of learning preferences from other-directed to self-directed) obtained by the Nursing Student Self-Disclosure Inventory; and the achievement, order, autonomy, succorance, dominance, change, endurance, and aggression personality needs scaled from the Edwards Personality Preference Schedule.

Data from 63 students identified as having left the school in the 3-year period under study, and data from a random sample of 173 active students from the same

time period, were used as bases for the discriminant analysis. Variables that were found to be predictive of group membership included first semester GPA, high school percentile rank, and the science subpart of the CQT. Students in the dropout group scored lower on all three variables. The three significant personality variables --order, dominance, and aggression -- depicted students in the dropout group as expressing a greater need for structure and organization than those in the continuing group. Members of the dropout group also expressed lesser needs for exhibiting leadership and self-assertion than did the continuing students.

Allen and associates (1988), concerned about a decline in the quality of applicants to baccalaureate nursing programs, attempted to identify factors that might discriminate between those at-risk students who were not likely to complete the program and those who would. Data were abstracted from the academic records of 296 students admitted to the Intercollegiate Center for Nursing Education in Spokane, Washington between Fall 1979 and Fall 1981. Completion of the program was found to be related to previous grades and college grades, as well as to lower scores on self-regard and thought organization.

Schwirian (1984) reviewed research related to outcomes of nursing programs and noted a common deficiency of the studies was that there were virtually no descriptions of the students' academic environments beyond the fact that they were located in an associate degree, diploma, or baccalaureate program. Astin (1977) did study environmental variables and found several to be predictive of attaining a career objective in nursing. Chances were substantially increased by attending a selective or prestigious institution; chances were substantially reduced by attending a 2-year public college.

From this review of the literature, it is evident that most of the studies used academic records or psychological tests to determine predictors of withdrawal.

Munro (1980) also asked students why they were withdrawing. The most frequently cited reasons for withdrawal were related to losing interest in nursing and becoming interested in other fields of study. Many of the students persisted in college but switched to alternative majors. Kopke (1979) also examined records from students who had withdrawn. The major reasons given by students leaving the program were categorized as changes in career, difficulties with one or more courses in the basic science component, and perceived inability to work with sick people.

This review indicates that persistence for baccalaureate nursing students has been shown to be related to variables found typically with all groups of students -- race, socioeconomic background, high school and college grades, and attending a selective university. Other variables include gaining an interest in other fields, expressing a lesser need for exhibiting leadership and self-assertion, and having lower scores on thought organization and self-regard.

A Definition of Persistence

Defining persistence (or, alternatively, attrition) is complicated by the fact that a student may leave college for a brief time and return at a later date. The Postsecondary School Transcripts Study (a supplement to the National Longitudinal Study of the High School Class of 1972) was conducted by Hill and Owings (1986) to study completion time for bachelor's degrees. The sample consisted of 4,440 graduates who received the bachelor's degree by December 1984. The study found that 49% of the students who eventually earned the degree entered college by the Fall after high school graduation and completed their degrees within 4 years. Three-fourths earned their degrees within 5 years after high school graduation, and 24% took 6, 7, or more years.

A more recent report by the California State Postsecondary Education Commission (1988) indicates that the statistics have not changed: fewer than half of America's college graduates now earn their bachelor's degrees within 4 years.

An alternative framework for studying the problem of attrition is to define as "persisters" all students who earn a degree, or who persist to complete it, within a specified time. Astin (1975) has used this definition in his studies; he defines anyone who is still enrolled after 4 years as a persister. Astin (1982) also found that roughly two-thirds of White students and one-third of minority students who enter college persist to eventual completion of their degrees.

The definitions of persistence used in this study were presented in Part I. We now turn to a detailed discussion of Astin's theory of involvement.

Astin's Theory of Involvement

Attrition from college has been shown to be related to many academic and socioeconomic variables. The particular effect of these factors on attrition for the baccalaureate nursing student were discussed in Part II. Aside from those variables, Astin postulates a theoretical framework outlining the effect of "involvement" on college attrition. Astin's theoretical framework of involvement constitutes the foundation for the purpose and hypotheses of this study.

The theoretical framework of student involvement has its roots in a longitudinal study of college dropouts which Astin reports in Preventing Students From Dropping Out (1975). The study endeavored to identify factors in the college environment which significantly affect students' persistence in college. In Four Critical Years (1977) Astin examined the relationship between student involvement and satisfaction with the college environment, and the association of student involvement with changes in student characteristics since entering school. In a later

publication (1984) Astin gives definition to the construct of "involvement" and elaborates to reveal a theoretical framework of involvement.

> Quite simply, student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience. Thus, a highly involved student is one who, for example, devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students. Conversely, a typical uninvolved student neglects studies, spends little time on campus, abstains from extracurricular activities, and has infrequent contact with faculty members or other students (p. 297).

Astin acknowledges that the involvement concept as a theory is early in its development. He has identified five basic postulates for the theoretical framework of involvement (p. 298):

1. Involvement refers to the investment of physical and psychological energy in various objects. The objects may be highly generalized (the student experience) or highly specific (preparing for a chemistry examination).
2. Regardless of its object, involvement occurs along a continuum; that is, different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times.
3. Involvement has both quantitative and qualitative features. The extent of a student's involvement in academic work, for instance, can be measured quantitatively (how many hours the student spent studying) and qualitatively (whether the student reviews and comprehends reading assignments or simply stares at the textbook and daydreams).

4. The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program.
5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement.

The first three postulates have to do with the nature, characteristics and measurability of "involvement." They define and communicate the construct in such a way that it is clearly understood in the context of students in an educational experience/setting.

The fourth postulate was tested in this study to ascertain which types of involvement were advantageous for nursing students. The final postulate begs the question, "to what degree do our policies and practices facilitate student involvement and what is their measurable effect on student outcomes?" A discussion of the findings of this study regarding the manner in which different forms of involvement affect outcomes for baccalaureate nursing students will appear in a later chapter.

Astin brings to light two additional principles inherent in the theoretical framework of involvement. That the psychic and physical time and energy of students are finite is explicitly acknowledged, as is the suggestion that student time may be the most precious institutional resource. The extent to which students can achieve particular developmental and educational goals is a direct function of the time they devote to activities designed to achieve the goals (p. 301), because "time devoted" translates to involvement. The location of buildings and availability of dormitories, the number and type of extracurricular activities, financial aid policies, and the rigorous nature of a curriculum can significantly affect how students spent their time and energy, and how much opportunity they have for involvement (p.

302). Institutional policy and practice, and even the physical plant, can affect the way students spend their time.

The final point to be made about the theoretical framework of involvement is that it readily lends itself to observation and measurement. "Motivation" and "effort" are less-easily measured psychological states. Involvement, however, connotes the behavioral manifestation of those states. "Involvement, in other words, is more susceptible to direct observation and measurement" (p. 301). This study will benefit from this characteristic of the involvement theory, in that many of the independent variables are reports of behaviors, rather than reports of attitudes or feelings.

Studies Pertaining to the Relationship Between Involvement and Persistence

Astin, and others, have researched the influence of involvement on a number of educational outcomes including satisfaction with college, changes in entering student characteristics, academic performance, and attrition from college. In Preventing Students From Dropping Out, Astin (1975) reported that involvement in extracurricular and non-classroom academic activities contributes to students' decisions either to drop out or to persist. The most important involvement factor was the student's residence. Living in a campus residence was found to be positively related to persistence, regardless of type of institution, sex of the student, race, ability, or family background. Other positive involvement factors included joining fraternities or sororities, participating in extracurricular activities or sports, enrolling in honors programs, getting involved in ROTC, and participating in professors' undergraduate research projects. Holding a part-time job on campus was found to promote retention, whereas working full-time off-campus was found to negatively

affect retention. The CIRP database was used in this study by Astin, as it was in a later Astin study which supported these findings.

In the later study (1977), Astin found that students' ratings of the undergraduate college experience and environment were strongly influenced by various forms of involvement. The more involved students reported greater satisfaction. Involvement was positively associated with retention, and many of the involvement variables were also associated with aspirations for graduate or professional degrees.

Studies of Involvement and Persistence for Baccalaureate Nursing Students

A few studies of persistence among baccalaureate nursing students have included some type of involvement variables. Smith (1990) analyzed questionnaires returned by 117 students who did not continue their enrollment in a baccalaureate nursing program. The questionnaires included 27 Likert scale items directed at academic and financial/employment factors that might contribute to attrition. The top five reasons for not continuing schooling were: dissatisfaction with class scheduling, not having enough money for living expenses, interference of work with studies, dissatisfaction with program requirements, and demanding work responsibilities. Working off-campus is an activity that distances the student from college activities and decreases the time available for involvement.

Astin (1975) utilized data from the 1966-70 CIRP Follow-Up Survey with multiple regression analysis to study persistence. He found a substantial negative weight associated with plans to marry while in college. This was consistent with his earlier studies which revealed that early marriage is a major cause of dropping out. Being married while in college also distances the student from other college activities and involvement.

A pilot study for this study was done (Ballard, 1990b) using a smaller sample from the CIRP 1983 Freshman Survey with 1987 Follow-Up Survey (FUS). There were 82 women in the FUS who had complete data and as freshmen chose to major in nursing and to earn at least a bachelor's degree. Multiple regression analysis was used to determine factors influential in attainment of the bachelor's degree (or continued pursuit of that degree) and perpetuation of the choice for a career in nursing. Of the 82 women, 50% (41 women) persisted.

The variables found to be predictive of persistence for a bachelor's degree and career choice in nursing included high school grades, being married while in college (negatively related), and being a full-time student. Being a full-time student reflects a high degree of involvement, as opposed to being a part-time student.

Allen and co-workers (1988) had findings that contradicted those of Smith and Astin. They found that marital status, the amount of time spent working, and the number of hours spent in course work were not related to persistence.

The involvement activities cited by these researchers were investigated in this study. The involvement patterns of nursing students are also impacted by the curriculum for baccalaureate nursing education.

The Influence of the Nursing Curriculum on Involvement: The Nursing Effect

The basic baccalaureate nursing curriculum requires more credits in the major than do most baccalaureate majors. An analysis of Directory of Degree Programs in Nursing (Anderson & Schmidt, 1984) establishes that the average basic baccalaureate nursing program requires 128 semester hours of credit of which 59, or 45%, are specifically nursing credits. Horns, Smith, & Miller (1990) randomly sampled 200 NLN-accredited baccalaureate programs and obtained virtually the same information. On 102 questionnaires it was revealed that the average number of semester hours required was 127, of which 57 (45%) were credits in nursing.

In most baccalaureate nursing programs, the general studies courses are taken in the first 2 years and the bulk of the nursing courses are taken in the last 2 years (Anderson & Schmidt, 1984). Thus, the typical baccalaureate nursing student may have an average amount of interaction with other students during the first 2 years, but may spend much of the last 2 years with the same 20, 30, or 40 other nursing students. This would limit interactions with other students and potentially limit opportunities for involvement in extracurricular activities during the last 2 years.

Another characteristic of the nursing curriculum which may further limit nursing students' opportunities for involvement is the time spent in clinical courses. For each credit hour devoted to clinical study, there must be 3 hours of clinical activities. Typically, baccalaureate nursing programs require about 18 credit hours of clinical studies (Anderson & Schmidt, 1984). This means that 54 credit hours are actually spent in various clinical settings with other nursing students. The time-consuming clinical courses represent an additional limitation for contact with other students, and also limit the amount of time for involvement in extracurricular activities. However, these courses, which are usually concentrated in the last 2 years of study, greatly increase nursing students' interactions and involvement among themselves.

In addition to the amount of time involved in clinical courses, the experiences shared during these courses add another dimension to student involvement. Performing invasive procedures on another person, dealing with illness or death and dying, negotiating with difficult family members or other health care personnel -- these situations, especially when confronted for the first time, are emotionally stressful and sometimes frightening. Students who share such experiences form strong bonds which leads to group cohesiveness. This

cohesiveness may work as an involvement factor which facilitates professional socialization and propels the nursing students to persist, or "hang in there," together. This nursing effect prototype of involvement may have the same positive effect on persistence as do the more typical kinds of involvement activities identified by Astin.

The nursing effect was investigated in this study by comparing nursing students with students from another major (education) who have similar background characteristics but a typical undergraduate curriculum. The involvement patterns of the education students would therefore not be influenced by the nursing effect.

Students of Education - A Comparison Group

As noted at the outset, persistence for nursing students was compared with persistence for students of primary education. Students of nursing and education are found to be similar in their academic achievements, SES, patterns of sex-role identity, and autonomy. Ballard (1990a) used national data from the Cooperative Institutional Research Program's (CIRP) 1989 Freshman Survey to contrast characteristics of freshman women who reported career aspirations as teachers, nurses, business women, attorneys, and physicians. The groups were compared on a number of variables that reflect academic ability, SES, life goals, and self-reported personal traits. Chi square analysis demonstrated similarities between nursing and education students as compared with the students of business, pre-law, and pre-medicine.

Nursing and education freshmen were found to have lower HSPGAs and to have parents with lesser incomes than the other students. They placed more importance on the goals of getting married and raising children. They also reported lower intellectual self-confidence and drive to achieve. Green (1987) using 1986 CIRP data, also found that students choosing a career in nursing were far less likely

to have a goal of developing a meaningful philosophy of life than those choosing other careers (21% vs. 44%).

Boughn (1988) used the Krutines Autonomy Scale and a modified Bem Sex-Role Inventory Scale to study whether female nursing students were as autonomous as female students in both traditional and non-traditional occupations. There were 1,046 baccalaureate students from the schools of nursing, education, business, and arts and science who participated in the study. Students from the schools of nursing and education received the lowest scores on autonomy and masculinity and the highest scores on femininity. There was no significant difference between the scores of students in the School of Nursing and students in the School of Education.

Comparing the nursing students with the education students will add an element of "control" for these background characteristics. As previously discussed, the nursing curriculum includes many courses in the major and many hours of laboratory classes. Therefore, a comparison of the persistence of nursing students with the persistence of education students facilitates the isolation of the involvement variables. Findings appear in a later chapter.

Hypotheses

Several topics in the review of the literature make it relevant to expand the general hypotheses to several more detailed hypotheses. College attrition has been found to be associated with students' race, academic performance, and SES. Students of primary education have been found to be similar to students of nursing in terms of these characteristics and also in terms of their sex-role identities. The curriculums for these two student groups are, however, dissimilar: students of nursing spend more time in classes and labs than do students of education. The students of primary education were included as a comparison group to add an

element of control for the background characteristics which they have in common with the students of nursing.

Greater involvement in the college experience has been found to foster students' persistence in college. Nursing students have been found to be more engaged with activities (marriage, off-campus jobs and non-student housing) that might limit their involvement with the academic and social activities that make up a significant element of the college experience. However, the nursing students spend more hours in classes and labs than do most other students. The increased hours in classes and labs and the unique experiences shared by nursing students may act as a counter force to the activities that limit their involvement in college, and actually increase their persistence in college.

The main research hypothesis was presented in Chapter 1. This hypothesis is elaborated upon in the seven hypotheses that are listed below. The hypotheses were tested by a series of contingency analyses and multiple regression analysis. The specific analyses will be detailed subsequently as the data for each hypothesis is examined.

1. Freshman students of nursing and primary education, as opposed to all other students, will be similar with respect to HSGPA and variables related to SES and sex-role identity.
2. The background characteristics of race, SES, and HSGPA which influence persistence for students in general will have similar influences on students of nursing and primary education.
3. Characteristics of the college that have previously been found to be related to persistence for students generally will similarly influence persistence for the students of nursing and primary education.

4. Students with higher levels of participation in academic and extracurricular activities will persist more than will students who participate at a lower level (for all three student groups).
5. Students who are committed to a distancing activity (being married, working off-campus or full-time, and/or living off-campus) will have less involvement with the academic and extracurricular activities than students who are not. The distancing activities have a negative relationship with the other involvement activities.
6. Distancing activities will have a negative impact on persistence for all three student groups. Among students of nursing and primary education there will be more withdrawal associated with being married, because more of them are married. The impact of off-campus or full-time work will be greater for nursing students because more of them engage in these activities.
7. Education students will have lower persistence rates than the other two student groups due to the negative effects of their background characteristics and their engagement with distancing activities. Nursing students will have the highest rate of persistence despite their background characteristics and involvement with distancing activities. Their increased persistence will be largely a factor of their increased hours in classes and labs. However, the rate of persistence will be higher than can be explained by their increased hours in classes and labs alone. The unexplained variance will be greater than the unexplained variance for the students of education and all other students. This increased portion of unexplained variance is the nursing effect.

CHAPTER 3. METHODOLOGY AND DESIGN

Instrumentation

The data used for this study were drawn from the Cooperative Institutional Research Program (CIRP) 1985 Freshman Survey and 1989 Follow-Up Survey (FUS). CIRP is a national longitudinal study of the American higher education system and is administered by the Higher Education Research Institute (HERI) at UCLA, under the sponsorship of the American Council on Education. The Freshman Survey has been conducted with more than 7 million students since it was begun in 1966. The FUS has been conducted with more than 500,000 students over intervals ranging from 3 months to 9 years after college entry (Astin, 1991).

The Freshman Survey exists in the form of a four-page Student Information Form (SIF), as described in Astin, et al., 1983:

> The SIF is designed to serve two functions: first, to obtain student input data for longitudinal research; and second, to obtain standard descriptive and normative data for general information. The form thus contains standard biographic and demographic items that have been administered annually to each entering class, as well as research-oriented items that have been modified from previous years.
>
> The SIF....was developed in collaboration with students, professional associations, participating institutions, government agencies, educational researchers, administrators, policy makers, and members of the CIRP Advisory Committee. It is designed for self-administration under proctored conditions and for processing onto magnetic tape with an optical mark reader. (p. 111).

Specifically, the SIF asks for a wide range of demographic data as well as information on students' high school backgrounds and educational experiences, career plans, opinions on a wide range of political and social issues, values, and self-

perceptions. There are data pertaining to the institution: type, selectivity, geographic region, racial mix, and other information (see Appendix A for a copy of the SIF).

A Follow-Up Survey (FUS) is presently administered by CIRP 2 and 4 years after college entry. The purpose of the longitudinal follow-ups is to assess student experiences and achievements during the undergraduate years and to determine how different kinds of college environments influence student development. The FUS includes many of the same areas of questioning as the SIF, thus providing a sort of pre-test and post-test profile. Additionally, there are questions pertaining to the college experience: satisfaction, participation in academic and extracurricular activities, years of college, reasons for stopping out or dropping out, and plans for, or report of, degree attainment and career choice (see Appendix 1 for a copy of the FUS). As previously stated, this study used the 1985 Freshman Survey and its corresponding 1989 Follow-Up Survey.

Sampling Procedure

Freshman Survey

The Freshman Survey's four-page Student Information Form (SIF) is generally completed during registration, freshman orientation, or the first few weeks of school. In 1985, 288,432 freshmen from 546 institutions participated in the Freshman Survey. A sampling process and weighting procedure were used to generate a sample that was a normative representation of all first-time, full-time freshmen. All institutions with entering freshman classes which had responded to the U.S. Department of Education's Higher Education General Information Survey were invited to participate in the 1985 CIRP Freshman Survey. The normative

sample selectively includes data only from institutions where the coverage of entering freshmen was judged to be representative. This judgment is based on the percentage of first-time freshmen who completed the 1985 SIF and on the procedures used to administer the forms. Four-year colleges are included in the national norms if over 85% of their first-time, full-time freshmen completed the SIF; universities were required to have over 75% participation, and the 2-year colleges, 50%.

To allow for consistent evaluation of the influence of college on the student, only first-time freshmen registering as full-time students are included in the normative sample. This normative sample of freshmen students was the sample from which further sampling was done for this study.

The sampling process and weighting procedure used to create the normative sample are described in The American Freshman: National Norms for Fall 1985 (Astin, et al., 1985). Stratification sampling was used to obtain the most representative sample of college freshmen. The strata were defined by the type, control, size, selectivity and predominant race attending the institution. Astin cautions that "a potentially important source of error in the stratification sampling is the nonrepresentativeness of the samples within each stratification cell. Although reasonable precautions are taken to minimize known sources of systematic bias, the data are subject to some unknown degree of constant and random sampling errors." Additionally, because this study uses sub-samples of nursing and primary education students, there is a greater potential for nonrepresentativeness of these sub-samples due to the stratification sampling.

From the 288,432 freshmen who completed the survey in 1985, 192,453 were first-time, full-time freshmen from 365 institutions included in the normative sample published in The American Freshman: National Norms for 1985.

Follow-Up Survey

Not all 192,453 students in the normative sample were included in the follow-up study. The 1989 follow-up data were requested in five different sampling groups from 91,164 of the 1985 normative sample of freshmen. The sample used for this study utilized two of the five sampling groups. Stratified random sampling selected 20,317 students and an additional 34,323 were from 53 institutions that agreed to participate in the follow-up as part of the Exxon Foundation Study.

The stratified random sampling for the follow-up was aimed at having approximately 175 respondents in each of 23 stratification cells, equally divided between males and females. Based on patterns of response observed in earlier follow-up studies, a sample size which would yield the desired number of respondents in each stratification cell was computed and then randomly selected from the population of freshman survey respondents included in the 1985 normative sample. A 22% response rate to the 20,317 mailed follow-up surveys yielded approximately 4,470 returned surveys.

The response rate to the second sample of 34,323 students from the Exxon Education Foundation Study was 42%, yielding 14,417 responses. The higher response rate perhaps resulted because these institutions administered the FUS themselves and were able to update the students' mailing addresses and to add a cover letter of their own to the survey packets. The random sampling from the 1985 normative group had been administered by a HERI sub-contractor using a generic cover letter from HERI and the address given by the student on the SIF at the beginning of her freshman year.

Of the random and Exxon combined sampling groups of 54,640 surveyed, 18,887 responded. It should be remembered that the CIRP database is already limited to first-time, full-time students. Of those, 10,755 were women who attended

a four-year college or university. This additional limitation was placed because there exists great variation in student outcomes, especially regarding persistence, between students who attend 2-year and 4-year colleges (Astin, 1982). Because this study focused on completion of baccalaureate education, the sample included only those students attending 4-year colleges or universities.

The states of California, Idaho, Montana, and Oregon require more than a bachelor's degree to obtain certification to teach in elementary school. Therefore, students from these four states were eliminated from the sample of primary education students. Given all of these restrictions, the sample size for each student group under study were as follows: nursing, 354; primary education, 537; and all others, 9,855. (See Table 1 for a schematic of the sampling structure.)

Representativeness of the Sample

There were 354 students who chose nursing as a career and major in 1985. Choosing nursing as a career in 1989 was operationalized by questionnaire responses that indicated the student (a) chose nursing as a career and major in 1985, (b) chose nursing as the career choice in 1989, and (c) reported nursing as the final or most recent undergraduate major in 1989. When persistence data was analyzed, the number of freshmen who chose nursing in 1985 dropped to 346. This occurred because eight students who declared nursing as a career and major in 1985 did not answer all of the items that involved the operationalization of persistence in the 1989 FUS (for example, the question of whether the student planned to enroll in the Fall of 1989). Therefore, analyses that involved any questions from the FUS involved smaller samples: 346 nursing students, 535 primary education students, and 9,791 other students.

Table 1. Sampling Design

1985 Normative Sample:	192,453
Total # in 1989 follow-up:	
	91,164
Of those:	36,542 not used
	20,317 from random sample
	34,323 from Exxon sample
Response rates were:	
	4,470 or 22% from random sample
	14,417 or 42% from Exxon sample
Total:	18,887 follow-up
Females from 4-year colleges or universities:	
	10,755
Eliminating CA, ID, MO, WY from the primary education group:	
	354 nursing
	537 primary education
	9,855 all other students
Total:	10,746

Of the 346 freshman nursing students recognized through analysis of 1989 data, 40% graduated in 4 years, 11% persisted and enrolled in 1989, and 49% defected (either changed careers or did not persist in school). Analysis of the defectors revealed that of the 169 defectors, 45% graduated in another career, 36% persisted in another career, and only 18% of the defectors left school (did not complete a bachelor's degree and did not plan to enroll in Fall, 1989). The outcomes of the 346 freshman nursing students appear in Table 2.

Table 2. Career and Degree Outcomes of Nursing Students, in Percent

	Nursing		Defected From Nursing			
	Grad	Persist	Grad	Persist	Quit	Total
	40	11	22	18	9	100
(N)	(140)	(37)	(77)	(62)	(30)	(346)

Two observations are particularly notable: (a) only 51% of the nursing students either graduated or persisted in nursing, and (b) only 9% left school. The 51% retention rate will be discussed in a later chapter. The low percentage of students who left school is subject to misinterpretation. Care must be taken in comparing this "dropout" rate with rates cited in other studies; it must be remembered that, in this study, leaving school was operationalized by failing to earn a bachelor's degree and planning not to enroll in school in Fall, 1989. Some of these students might have attained an AA degree within the 4 years and subsequently left school. It stands to reason that this study's dropout rate was deflated by the manner in which it was operationalized. Likewise, the persistence rate could also have been underestimated if there were students who had attended several semesters of school, did not plan to re-enroll for 1989, but did plan to re-enroll at a later date.

Eckland and Henderson (1981), using data from the National Longitudinal Study of the Class of 1972, found that approximately 65% of first-time entrants to the 4-year college sector will eventually obtain 4-year college degrees, and approximately 29% will withdraw from all forms of formal participation in higher education. The difference between the withdrawal rate cited in this study and the withdrawal rate cited by Eckland and Henderson is partly due to the manner in

which withdrawal was operationalized in this study. The manner in which withdrawal was operationalized represents a threat to the internal validity of the study.

There was a second factor which might have caused an underestimation of the withdrawal rate and thus impacted the ability of the study to accurately measure persistence. This factor involved greater response to the follow-up questionnaire by those students who persisted in college and lesser response by those students who did not persist. This would cause the percentage of students who withdrew from nursing school and college to be underestimated. The file from which this material was taken includes only those cases for which complete (Freshman Survey and Follow-Up Survey) data are available. Therefore, it is not possible to compare Freshman data for responders with that of non-responders to assess the degree of bias or direction from which the study's data might have come.

A third factor might also have been involved --students who attend college part-time are less likely to achieve their degrees. The exclusion from the study of the part-time students could have caused the percentage of students who withdrew to appear lower than it actually was. NLN data (1991) reveal that 86% of baccalaureate nursing students enroll full-time and 14% enroll part-time. Therefore, the deletion of the part-time students would have had a nominal impact on the persistence rates.

There are a few aspects of this study that pose limitations to the generalizability of the findings to the population of nursing students. The study included only full-time students who had not previously attended college. Students who had studied in a different major and switched to nursing, students who previously obtained associate or diploma degrees and licensure as RNs and were returning to obtain bachelor's degrees, and students who attended college part-time

were not incorporated into the study. The findings will only be generalizable to basic baccalaureate nursing students.

A second factor that limits the generalizability of the study is that sampling for the study was not entirely random. Roughly one-third of the sample was randomly sampled. To determine the degree to which the sample was representative of the population of basic baccalaureate nursing students, the study sample was compared with NLN data on the variables of geographic representation and representation based on control of the college.

The NLN is the accrediting body for schools of nursing in the U.S. and publishes data on the population of nursing students. Examination of the geographic representation of the population of nursing students reveals representation of nursing students in the North Atlantic, Midwestern, Southern, and Western regions to be 24%, 30%, 34%, and 12%, as compared with 43%, 29%, 20%, and 8% for the study sample, respectively. The CIRP data is known to sample more heavily from the Northeastern region and less from the Southern and Western regions, because more schools in the Northeast participate in the study.

According to NLN data (1991), of the 28,883 admissions to baccalaureate programs in 1985, 56% were admitted to public programs and 44% were admitted to private programs. The study sample was comprised of 28% of students entering public programs and 72% entering private programs. The discrepancy between the NLN and study sample is in part due to the fact that the Northeastern region was over-represented in the sample and there are more private schools in the Northeast. Additionally, there is better response to the survey from those students who attend private schools (they have better grades, which are associated with greater response rates) and more private schools participated in the study.

To summarize, the reliability of the study is somewhat threatened by the manner in which withdrawal was operationalized, the occurrence of non-response bias, and the inclusion of only full-time students in the study. Generalizability of the study is limited by over-representation of students attending private schools and students attending schools in the North Atlantic region. Given that the great majority of baccalaureate nursing students attend college full-time and that the study examined factors that influenced students to persist, the limitations of the study do not invalidate the findings which do bear some functional implications for the administration of undergraduate nursing programs.

Methodology and Design

The purpose of the study is to discover factors that are related to persistence for baccalaureate students of nursing. These students are compared with students of primary education because the two groups have previously been found to be similar with respect to variables related to SES, academic performance, and sex-role identity. The comparison will provide a sort of "control" for those variables. The factors being studied include those that have previously been found to be related to persistence (academic performance, SES, and sex-role identity) and factors related to students' involvement in the college experience.

Contingency analyses (using Chi Square analysis as the test of statistical significance) were done to discover how the three groups of students (nursing, primary education, and all others) were distinguished by variables related to SES, sex-role identity, and level of participation in the distancing and involvement activities. This was done for two reasons: (a) to validate whether the nursing and primary education students were indeed similar to each other and different from all other students in terms of their SES and sex-role identities, and (b) to establish where the three groups varied on the independent variables. Additional

contingency analyses were then done to identify the relationships between the independent variables and persistence for all three groups of students. This was done to begin identifying which variables were, indeed, related to persistence. The variables were then entered into multiple regression equations to determine the contribution of each variable to persistence for each group.

In the multiple regression equation the variables were arranged in a step-wise fashion in accordance with Astin's Input-Environment-Outcome (I-E-O) model. In his book, Assessment for Excellence (1991), Astin explains how the I-E-O model can be used to arrange variables in a step-wise manner in multiple regression analysis, providing for the effect of background variables and earlier academic experiences to be identified and measured prior to measuring the effect of variables that occur during the college experience. The I-E-O model is specifically designed to produce information on how educational outcomes, such as persistence, are affected by different educational policies and practices, such as the student's level of involvement in the educational experience.

Input refers to the background factors, i.e. the condition, characteristics, accumulated experiences, personal qualities, and academic performance that the student brings to her higher education experience. For this study, the independent variables in the input stage include race, SES and high school grades.

Environment refers to the baccalaureate program and the student's experiences in the program. There were four categories of environmental variables in the study. Each category constituted a step entered into the multiple regression equation. The first category of environmental variables included the distancing variables -- working while attending college, being married, and living in student vs. non-student housing. The second category of variables related to the institution -- type (4-year college vs. university), control (public vs. private) and selectivity. The

academic and social activity variables are intermediate outcome variables and were entered in the third step. They were entered after the distancing variables so that the influence of the distancing variables on the involvement variables could be evaluated by examining the partial correlation coefficients generated by the multiple regression equation. The fourth category included the most frequently-cited contributor to persistence in college --college grades.

The outcome, or the dependent variable, for this project is persistence towards a bachelor's degree in nursing. Rather than a dichotomous variable, persistence was defined in a continuum with three different values. These values were labeled graduate, persister and defector, as described in Chapter 1.

The multiple regression analyses and the contingency analyses are described in further detail within the context of the hypotheses which they test. These descriptions and the results of the analyses are presented in the chapters that follow.

CHAPTER 4. STUDENT PROFILES AND COMPARISONS

Comparing Students of Nursing and Primary Education with All Other Students

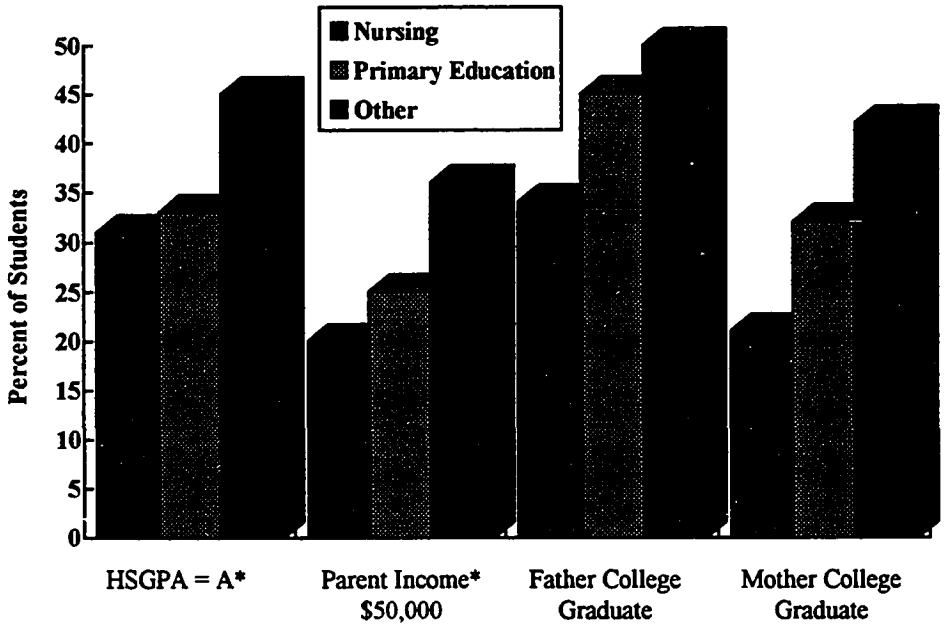
Students of primary education were compared with students of nursing on background variables to add an element of "control" for the characteristics that they have in common, so that other characteristics unique to nurses might be more evident. The background variables included the SES variables of parents' income and education, HSGPA and seven variables related to sex-role identity.

To conduct this analysis of "likeness," contingency analyses (using a Chi square value of 0.05 to designate statistical significance) involving only the nursing and education groups was performed on variables of HSGPA, SES, and sex-role identity. If there was no significant difference, the nursing and primary education students were found to be similar. In such cases, a second Chi Square analysis was then computed comparing the nursing and primary education students with all other students. When a significant difference was demonstrated among the three groups, the assumption was that the nursing and education students were alike on these variables and different from all other students.

These comparisons are shown in Table B-1 in Appendix B. The first column of Chi Square values applies to the test of similarity between the students of nursing and primary education. The second column applies to the test of likeness among the three groups. Where significant differences were found in the variables among the groups, the Chi Square value is designated with an asterisk. Figure 1 presents a summary of the comparison of students of nursing and education with all other students. There were moderate differences among the groups and the data did support the likeness of the nursing and primary education groups and established them as being different from all other students.

The nursing and education students were distinguished from all other students by having lower HSGPAs, more traditional sex-role identities, and parents with lesser incomes as can be seen in Figure 1-a. The percentage of students who earned an A average in high school were 31%, 33%, and 45% for the students of nursing, primary education, and all other students, respectively. Only 20% of nursing students had parents with incomes of $50,000 or more as compared with 25% of students of primary education and 36% of all other students.

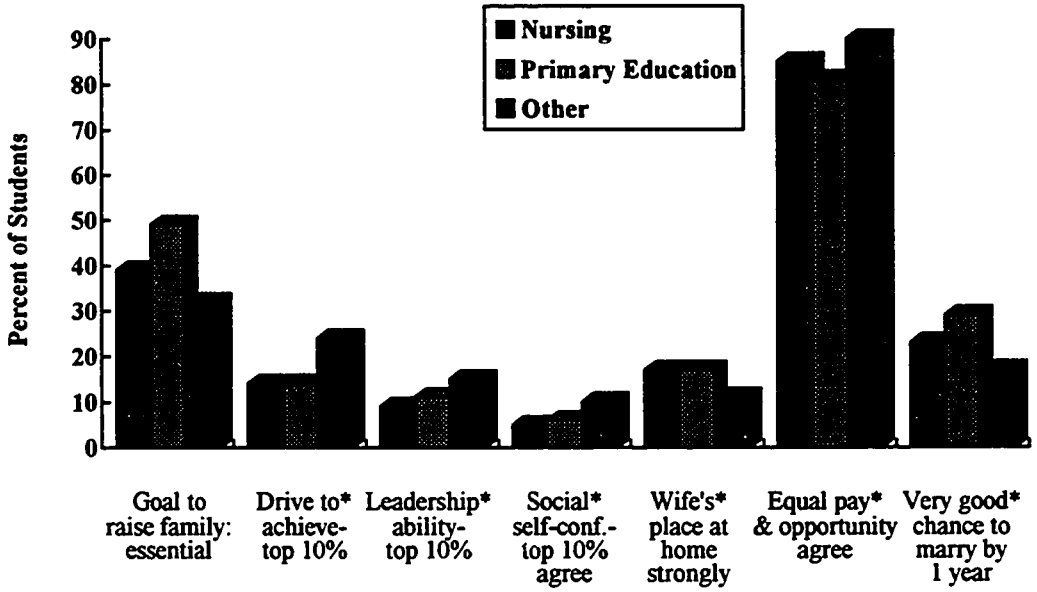
The students of nursing and primary education were not found to be alike in the other two SES variables --father's education and mother's education -- although there was a difference among the three groups with nursing students having the lowest educated parents and other students having the highest. Nursing students had fewer fathers and mothers who were college graduates than did the group of all other students - 34% vs. 50% and 21% vs. 42%, respectively.



* Students of Nursing and Primary Education Alike as Compared with All Others ($p \leq .01$)

Figure 1-a. Establishing the Likeness of Students of Nursing and Primary Education as Compared with All Other Students in HSGPA and SES, in percent

As can be seen in Figure 1-b, the students of nursing and primary education were found to be similar to each other and different from all other students with respect to all but one of the variables depicting sex-role identity. The primary education students had stronger goals of raising a family than did the nursing or other students -- forty-nine percent of them regarded the goal of raising a family as essential as compared with 39% of nursing students and only 32% of other students. For each of the other six sex-role identity variables the nursing and primary education students were found to be like each other and different from all other students, although some of these differences were not very remarkable.



* Students of Nursing and Primary Education Alike as Compared with All Others ($p \leq .01$)

Figure 1-b. Establishing the Likeness of Students of Nursing and Primary Education as Compared with All Other Students in Sex-Role Identity

The nursing and primary education students were distinguished by their lower drives to achieve, stronger beliefs that married women should be at home with their families, and less strong beliefs in equal pay and opportunities for women. The nursing and education students also reported lower levels of leadership ability

and social self-confidence than did the group of all other students. A significant difference was shown between all three groups in their estimates of whether they might marry while in college or within one year of finishing college; students of education reported the greatest chance and all other students reported a lesser chance.

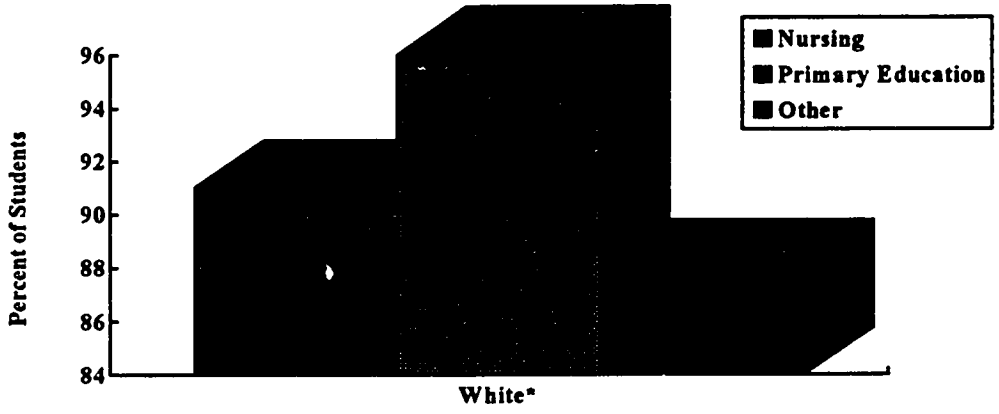
Hypothesis 1 was therefore generally supported: the students of nursing and education were similar to each other and different from all other students in terms of the variables related to HSGPA, sex-role identity and parent's income. Therefore, the students of education appear to serve as a suitable comparison group for the students of nursing because they are basically alike on key background variables, but are distinguished by their curriculums (as was described in Chapter 2).

Student Profiles

Following profiling of the groups with regard to background characteristics, they were further profiled with the study's remaining independent variables. The profiles were constructed from a single contingency analyses which tested whether the three student groups were different in terms of the independent variables (race, type and selectivity of the college, distancing activities, academic activities, and social activities). These profiles were necessary for interpretation of subsequent analyses.

The profiles are shown in Table B-2 in Appendix B. Figure 2 presents a summary of the profiles. For most of the variables there were small but significant differences. For students of nursing, education, and all other students, the representation of White students was 91%, 96%, and 88%, respectively (see Figure 2-a). The low representation of non-whites may be due to the fact that only four-year colleges and universities were sampled, there was greater representation of

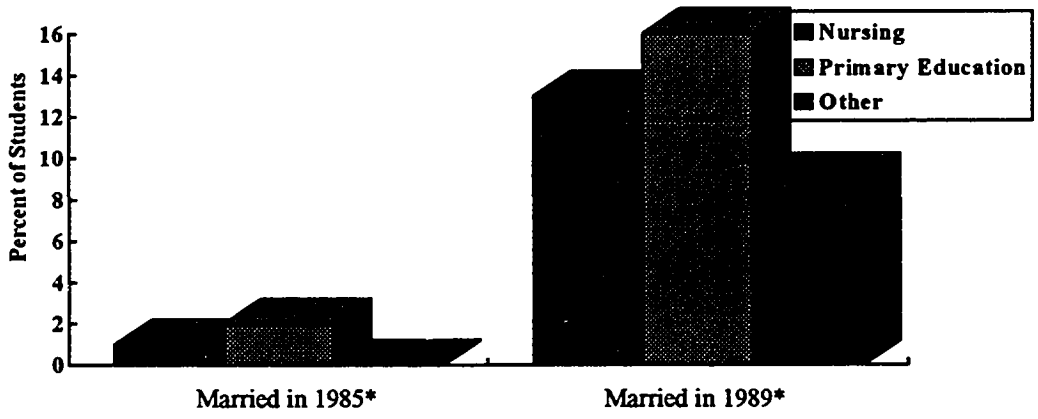
students from the north-east, and more students who attended private universities were sampled. It is also possible that there was greater non-response among those students who were non-white.



* p≤.01

Figure 2-a. Profiles for White

The distancing activities included marital status, amount and location of paid work, and type of residence. The greatest number of students who were married in both 1985 and 1989 were from the primary education group and the smallest number were from the group of those not in nursing or education (see Figure 2-b).



* p≤ .01

Figure 2-b. Profiles for Marital Status

Although the review of the literature indicated that more nursing students were married as compared with most other students, among the students surveyed this was not the case. As freshmen, only 1% of nursing students were married as compared with 2% of primary education and less than 1% of all other students. By their fourth year of college the differences were greater with more of the primary education students being married and the least being all other students, 16% and 9%, respectively.

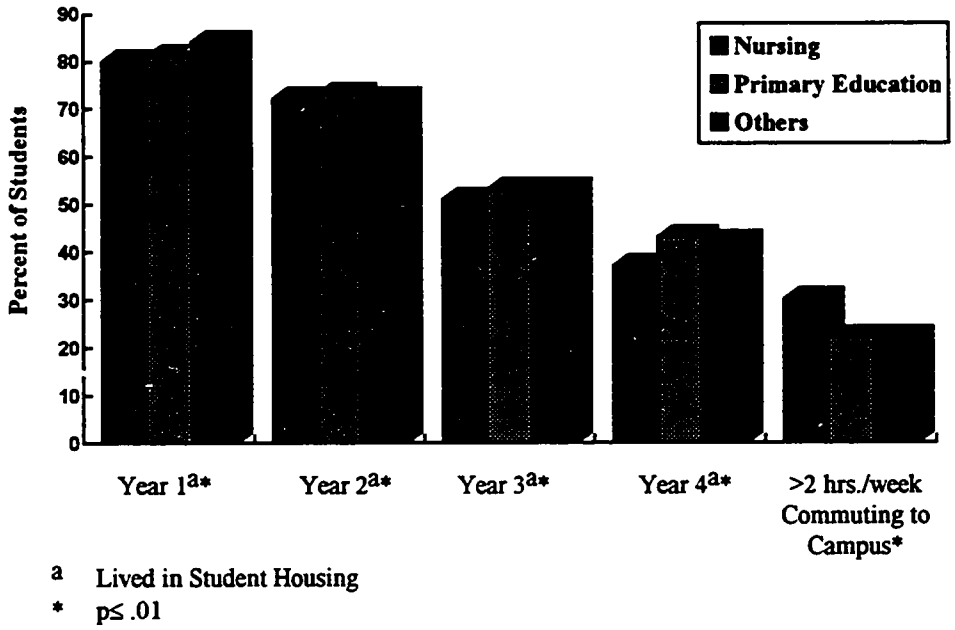


Figure 2-c. Profiles for Residence

From Figure 2-c it can be seen that there was no difference among the groups in the percentage of students who resided in student housing; however, the nursing students spent more time commuting to campus during their last year of school. Thirty percent of the nursing students spent 3 or more hours commuting to

campus as compared with only 21% and 20% of students of primary education and all other students, respectively. This contrary finding might be explained by the fact that nursing students were not only spending time driving to campus, but were also driving to off-campus settings for clinical experiences.

Figure 2-d reveals that the nursing students held negligibly more part-time jobs off-campus, while negligibly more of the other students held part-time jobs on-campus, and the nursing students worked the most hours per week and the primary education students worked the least. These were small but significant differences. There was no difference among the groups in the numbers of students working full-time.

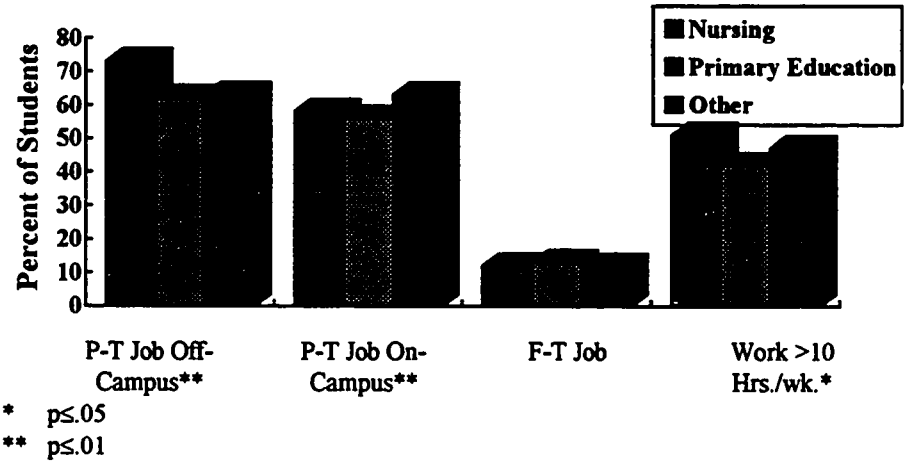
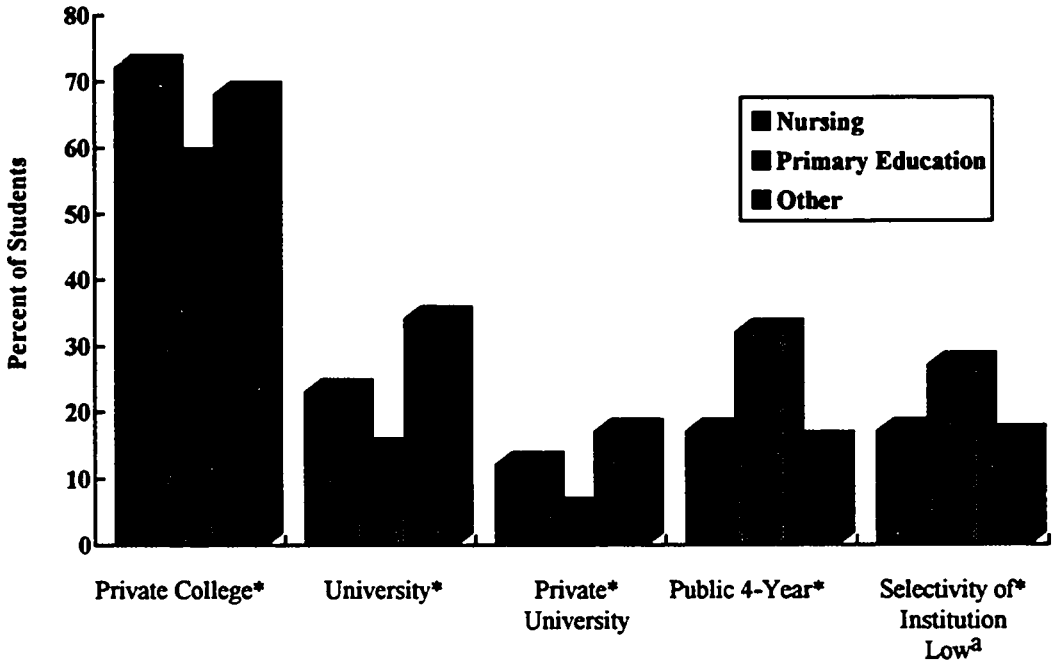


Figure 2-d. Profiles for Employment

There were greater differences for the variables related to the characteristics of the institution --institution type and selectivity of the institution. Twice as many primary education students as students from the other groups attended public 4-year colleges and less selective schools (see Figure 2-e). Private universities were more widely attended by students of nursing and even more so by the group of all other students.



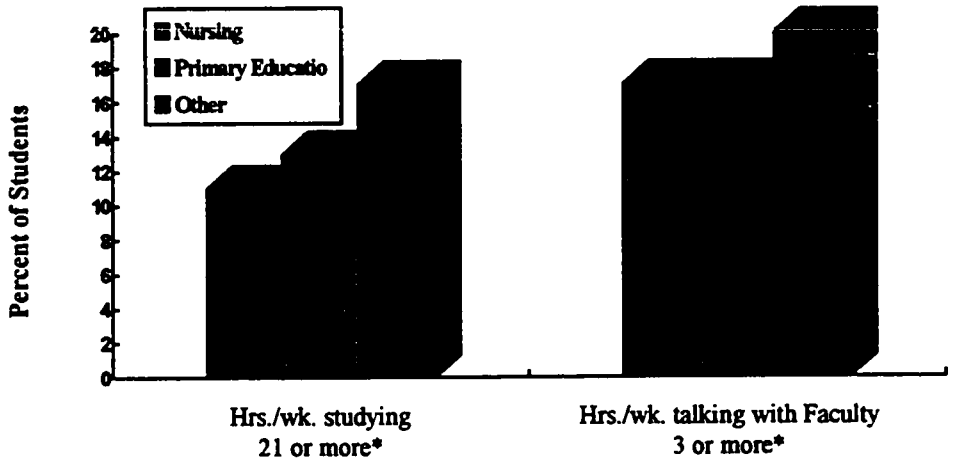
[a] Selectivity = SATV + SATM. Low= 0-924, Med. = 925 - 1074, High = 1075 - 1600

* $p \leq .01$

Figure 2-e. Profiles of Institutional Variables

The academic activities included the number of hours per week during the student's last year in college spent in classes/labs, studying, and talking with faculty outside of class, and the activities of having worked on a professor's research project or assisted in teaching a course. Figures 2-f and 2-g pertain to these activities.

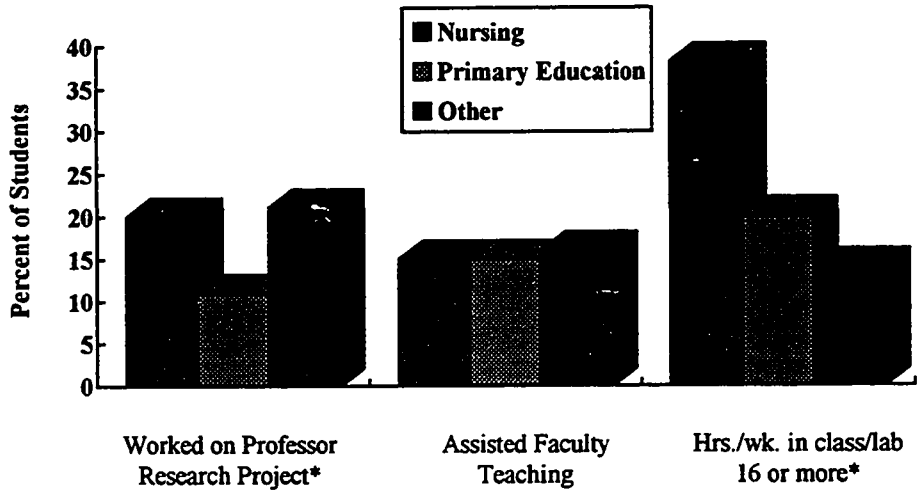
The most pronounced difference among the groups was in the greater number of hours per week spent by nursing students in classes and labs -- 38% of nursing students spent more than 20 hours per week in such activities. In contrast, 20% of students of primary education and 14% of all other students spent more than 20 hours per week in classes and labs. A much smaller relationship in the opposite direction occurred for the number of hours per week spent studying -- 11% of nursing students spent 21 or more hours per week studying as compared with 17% of the group of other students.



* p≤ .01

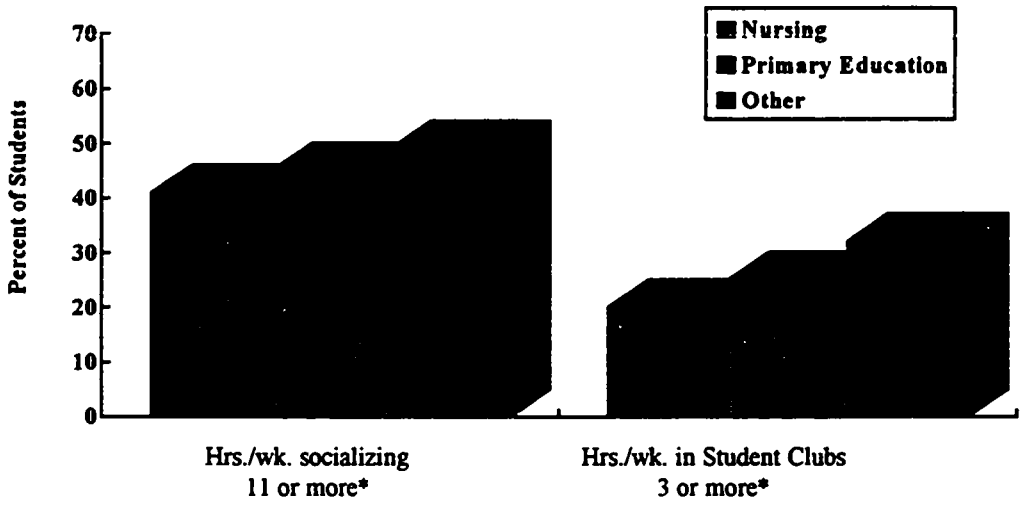
Figure 2-f. Profiles for Academic Activities

Students of primary education had fewer experiences of working on a professor's research project. Faculty for nursing programs are encouraged to conduct research and they frequently involve their students. This might also be true for the non-nursing/non-primary education faculties. Perhaps there is less research being done by faculty of primary education. There were no differences among the groups in the amount of time spent talking with faculty outside of class or the experience of assisting faculty in teaching a course.



* p≤ .01

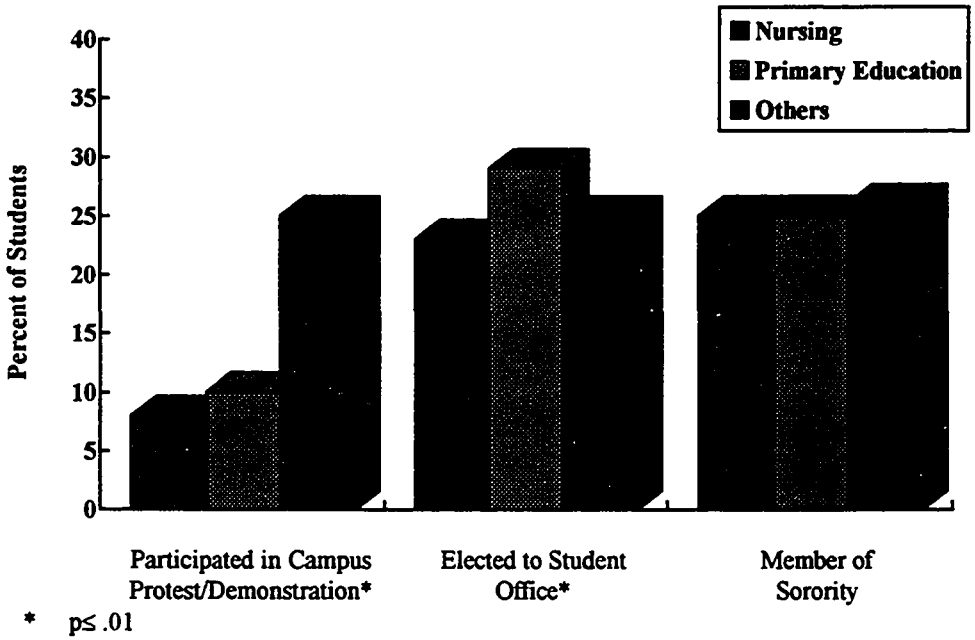
Figure 2-f, continued. Profiles for Academic Activities



* p≤ .01

Figure 2-g. Profiles for Social Activities

The social activity variables included activities that were social and not directly academic in nature. Figure 2-g shows that nursing students spent moderately less time in student clubs and slightly less time socializing with friends. Forty-one percent of nursing students reported spending no time with students clubs or groups



* p≤ .01

Figure 2-g, continued. Profiles for Social Activities

during their last year of college as compared with 32% of the group of other students. There was much less participation in campus protests and demonstrations by the nursing and primary education students. Students of primary education were more often elected to student office. Sorority membership did not vary among the three groups.

To summarize, most differences among the groups were marginal. Significant differences that were worth noting included: (a) the nursing students spent more time commuting to campus and more time in classes/labs; (b) primary education students had lesser participation in professors' research projects, attended less selective schools and more of them attended public 4-year colleges; and (c) more students in the other group attended private universities and had greater participation in campus protests and student clubs. The chapters that follow discuss the relationships between these variables and the persistence of students towards achieving their bachelors degree in their originally chosen career.

Given these profiles, there was an additional opportunity for evaluating whether the primary education group was appropriate as a "control group" for the nursing group. A general comparison of these two groups (from Table B) reveals that nursing students spent more hours commuting to school, participated in professors' research projects to a greater degree, and spent more hours per week in classes and labs. The primary education students attended less selective schools. The number of independent variables in which the primary education and nursing groups differ is small. The number of hours spent in classes and labs is a major involvement variable. Results of multiple regression analyses (Chapter 9) will demonstrate how this variable interacted with the other independent variables to contribute to persistence for the two groups.

CHAPTER 5. RELATIONSHIP OF BACKGROUND CHARACTERISTICS TO PERSISTENCE

Persistence

It was hypothesized that the background characteristics that have been found to be associated with persistence in college for most students would likewise influence the persistence of students of nursing and education. In reading this discussion, it should be remembered that persistence was operationalized with three levels: (a) graduate -- a student who graduated with a bachelor's degree within 4 years and maintained her original career choice, (b) persister -- a student who had not attained the bachelor's degree but who planned to enroll in 1989, also in the originally chosen career, and (c) defector -- a student who had not completed the bachelor's degree and did not plan to enroll in 1989, or a student who changed from the original career choice to another career, regardless of whether she graduated, persisted, or withdrew from school. Therefore, the defector group included both students who withdrew from school and students who changed from their original career choices into any other careers. Persistence was defined in this manner in order to discover factors related to retention in baccalaureate nursing programs.

Table 3 shows the patterns of persistence in the original career choice for the three groups of students. The students of primary education, who had a combined graduation and persistence rate of 58%, were the most persistent in pursuit of their degrees. The students of nursing were nominally less persistent, with a combined rate of 51%. Although nursing students have been cited as having higher persistence rates than most students, this study found that students of primary education were even more persistent. The group of all other students had a combined graduation and persistence rate of only 24% which was substantially lower than the rate for students of nursing and primary education.

Table 3. Persistence Towards Degree Achievement in the Career Originally Chosen, in Percent

	Graduated	Persisted	Defected	(N)
Nursing	40	11	49	(346)
Primary Education	49	9	42	(535)
All Other Students	20	4	77	(9,791)

$\chi^2 = 440.27$; $p \leq .01$

A 24% combined graduation and persistence rate for the non-nursing and non-primary education students leaves 77% as students who defected. This defector group included both those students who quit school and those who switched to another course of study and career choice. Therefore, although they may have been categorized as defectors in this analysis, a substantial number of the other students may have persisted and graduated in another career.

Women who enter college having chosen a professional career in primary education or nursing are perhaps more certain of their career choices than are most other students, and hence have a lower rate of defectors. As shown in Table 4, bivariate analysis revealed that 69% of the nursing students and 67% of the primary education students reported in 1985 very little or no chance that they would change their career choices, as compared with 35% of all other students. It appears that the other students were indeed more likely to change their choice of career given the high rate of defection.

Table 4. Predictions of Changing Career

	Nursing	Prim. Ed.	Others
Some/Very Good Chance	31	33	65
No/Very Little Chance	69	67	35

$\chi^2=372.53$; $p\leq.01$

In defining the nursing and primary education students, both the major and the career choices were used. For the group of other students, only career choice was used to specify the group. Because there was more strict criteria for membership in the freshman nursing and primary education groups, their persistence rates might have been "pumped up".

The Relationship of Background Variables to Persistence

The background characteristics studied included (a) being White, (b) the SES variables of parents' income and education, and (c) HSGPA, and were hypothesized to be related to persistence for each student group. Contingency analyses, using Chi Square as the test for statistical significance, revealed that the data could not support the hypothesis. For the group of students not in nursing and not in primary education, there was a higher percentage of graduation within 4 years in the career initially chosen among those who had good grades in high school, whose parents had greater income and education than other students' parents, and who were White. However, the findings for the students of nursing and primary

education did not follow this pattern. The data are presented in detail in Table C (see Appendix C), and are graphically summarized in Figure 3.

For the students of nursing, HSGPA was the only background variable with a statistically significant relationship to persistence towards completion of the bachelor's degree in nursing. From Figure 3-a, it can be seen that students who averaged A's in high school graduated within 4 years in nursing at a greater rate (55%) than did those students who had averaged B's (36%) or C's (5%). This finding is especially significant because the nursing students had significantly lower HSGPAs than did all other students. This study, which used contingency analyses, and Astin's study (1977), which used multiple regression analyses, both found that HSGPA was positively related to completion of the bachelor's degree and attainment of the nursing career, which is to be expected.

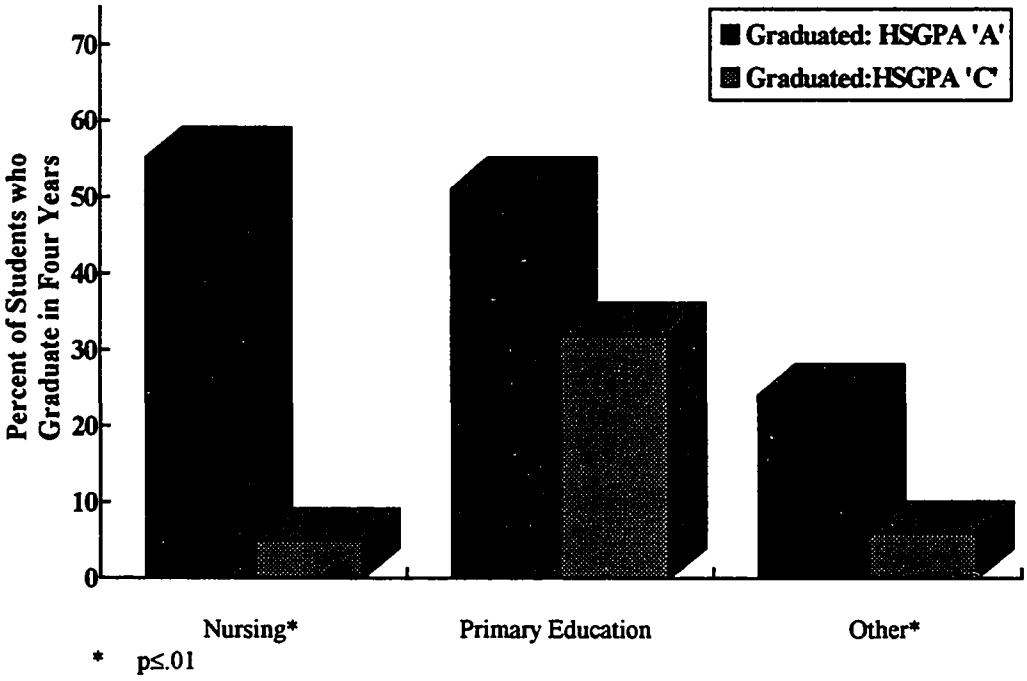


Figure 3-a. The Relationship of HSGPA to Graduation in Four Years

Dunkelberger & Aadland's study (1984) did not look at HSGPA, but did find that obtaining the RN degree was related to aptitude, as defined by individual test scores obtained from high school seniors on vocabulary, reading, mathematics, and letter groups tests. Knopke (1979) also did not look at HSGPA, but did find a positive relationship between nursing students who left their educational programs and low high school percentile ranks.

Dunkelberger & Aadland (1984) and Astin (1977) found that being Black was negatively associated with degree achievement for nursing students. Those findings were supported by this study which revealed an apparent strong relationship between persistence and race for students of primary education and students of nursing. However, the sample size of this study restricted the analysis to White vs. non-White and did not allow for analysis by individual races.

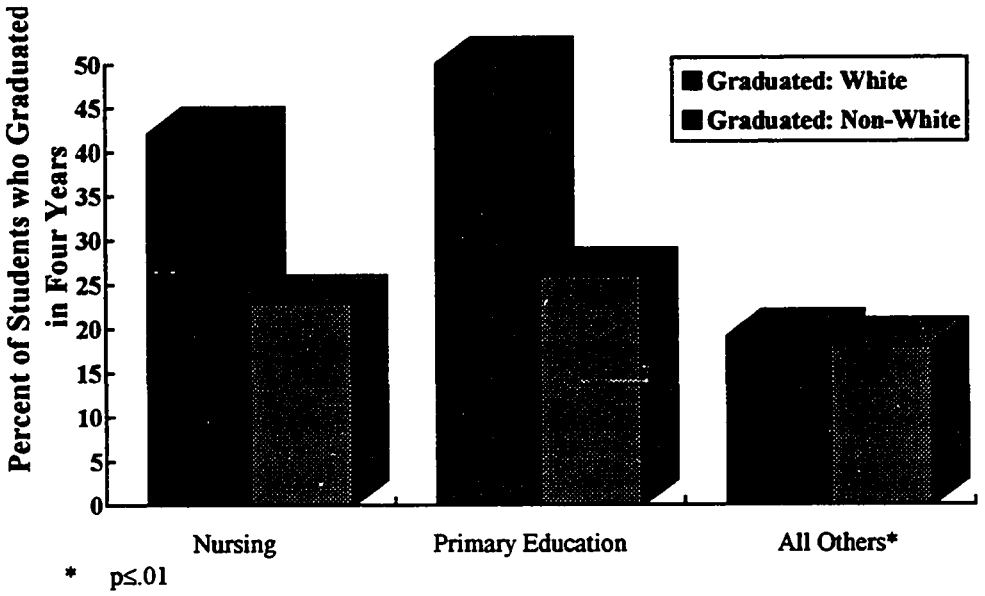


Figure 3-b. The Relationship of Being White to Graduation in Four Years

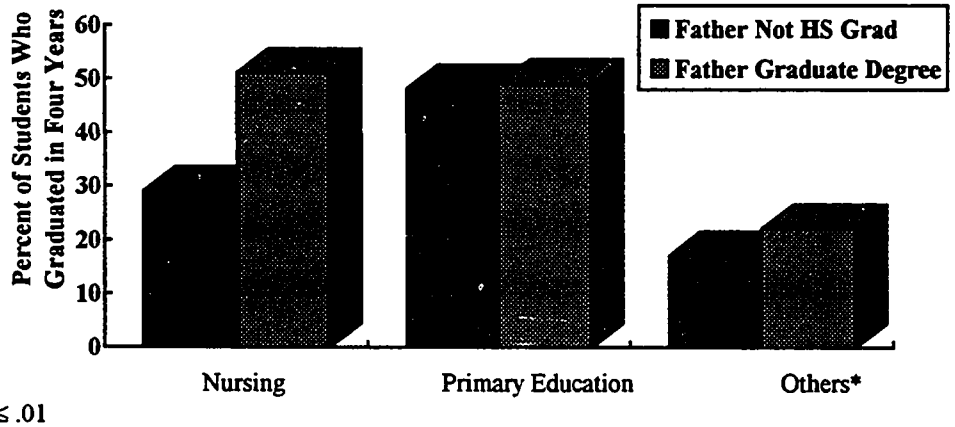
The representation of White students was 91% for the nursing students and 96% for the primary education students. Of the nursing students, almost twice as many White students graduated in nursing within 4 years than did non-White nursing students -- 42% vs. 23% (see Figure 3-b). In practical terms, a 90% increase represents a substantial difference. However, the Chi Square value (4.54; $p=.10$) did not indicate a statistically significant relationship. With the primary education students, a similar relationship between persistence and race was observed. Despite the seemingly larger effect of being white for the nursing and primary education students, the significant level did not meet the .05 criteria, and therefore, the conclusion must be that there was not a statistically significant effect. In several other analyses there will appear to be a greater effect for the nursing and primary education students, but again, the p level will not meet criteria for statistically significant relationships.

The difference in persistence between the White and non-White students for the group of other students appeared to be negligible -- 19% vs. 18%. However, that was a statistically significant relationship (18.04; $p\leq.01$). The fact that there were more non-White students among the group of other students (88% were White) might have strengthened that relationship.

A greater factor is the sample size for the nursing and primary education groups -- there were only 354 nursing students and 537 primary education students in this analysis as opposed to 9,855 students in the other group. Had there been a larger sample of nursing and primary education students, the significance levels might have increased to at least $p=.05$. This limitation of sample size will be discussed in other situations where it is suspected of affecting statistical significance or practical interpretation of the data.

Of the three measures of SES -- parents' income, father's education, and mother's education -- all appeared to be related to bachelor's degree attainment among the nursing students, but none of the relationships were statistically significant. Careful examination of Table C reveals that the relationships among the three SES variables and persistence for the groups of nursing students is similar to the relationships for the group of other students. However, the relationships were statistically significant only for the group of other students.

For example, for both groups, the numbers of students who graduate within 4 years generally increased as the levels of students' fathers' educations increased. The number of students who withdrew generally increased as their fathers' levels of education decreased. Twenty-nine percent of nursing students whose fathers were not high school graduates completed their degrees in nursing within 4 years, as opposed to 51% of students whose fathers held graduate degrees (see Figure 3-c). The significance level for this Chi Square analysis was $p=.09$. For the group of other students, the analysis was significant at a level of $p \leq .01$, even though there did not appear to be as strong a relationship between father's educations and students' 4-year degree completion as among the group of nursing students.



$p \leq .01$

Figure 3-c. The Relationship of Father's Education to Graduation in Four Years

Once again, had there been a larger sample of nursing students, the significance level might have increased to at least p=.05. The impact of the smaller sample of nursing and education students affected the statistical significance for the variables of mother's education and parents' income, as well (see Figure 3-d). The implications of the relationship between parents' income and education are greater for students of nursing because their parents had significantly less education and income than did the parents of all other students.

Dunkelberger and Aadland (1984), using contingency analyses, found a relationship between SES and persistence for nursing students that was not corroborated with a subsequent multiple regression analysis. Their study used data from the National Longitudinal Study (NLS) of the High School Class of 1972, which utilized an index for SES which included father's education, mother's education, parental income, father's occupation, and a household items index.

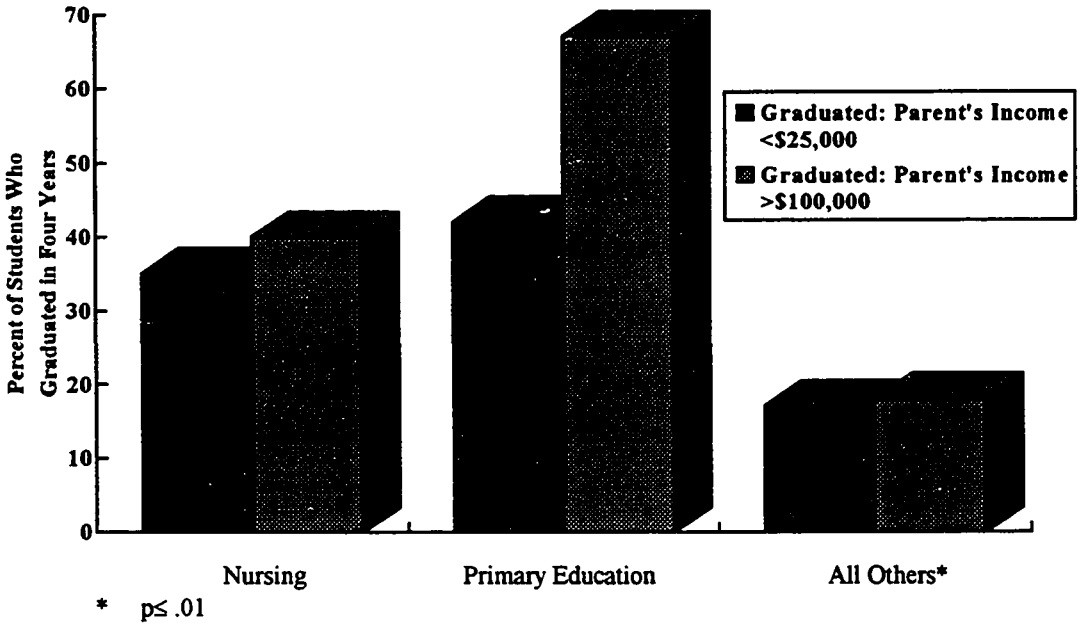


Figure 3-d. The Relationship of Parents' Income to Graduation in Four Years

Munro (1977), using the same NLS data, performed path analysis to test a theoretical model of college nursing student dropouts and also found that SES played no significant role. Astin (1977), likewise did not find a relationship between SES and persistence using multiple regression analyses. Findings from this study corroborated these previous studies.

In the case of the students of primary education, none of the background variables were found to have a statistically significant relationship with persistence towards bachelor's degree attainment in primary education. Findings for all three groups are summarized in Table 5.

Table 5. The Relationship of Background Characteristics to Persistence

	Nursing	Prim. Ed.	Others
White			**
Parents' Income			**
Father's Education			**
Mother's Education			**
HSGPA	**		**

* $p \leq .01$

For the group of students not in nursing and not in primary education, persistence towards a bachelor's degree in the original career choice was found to be related to all of the background variables of HSGPA, SES, and being White. For the group of nursing students, statistical interpretation of the data reveals that HSGPA was the only background variable related to persistence. None of the variables were found to have statistically significant relationships with persistence

for the students of primary education. Had the sample size been larger, being White and the SES variables might have been found to be associated with degree completion for the students of nursing and primary education.

Students of nursing and primary education were found to be similar with respect to HSGPA's, parents' income and parents' education. Further analyses revealed that parents' income and education had no relationship with persistence in the original career choice for either the students of nursing or the primary education students.

HSGPA was found to be related to persistence in nursing for the nursing students but was not found to be related to persistence in primary education for the primary education students. Remembering that the students who persisted in another career choice were included in the defector group sheds light on this finding. Perhaps there was a group of higher GPA students of primary education who persisted, but in an alternate career. They would be counted as defectors or non-persisters. If the group that persisted in another career had been excluded from the study, the proportion of high GPA students who persisted in primary education might have increased and revealed a positive relationship between persistence in primary education for the students who started with that career choice.

Although this theory is based largely on supposition, it is supported by volumes of literature that establish a positive relationship between HSGPA and persistence in college in a career chosen at the time of admission or at a later time.

The inclusion of the alternate-career persisters in the defector group in this study's design confounded the analysis of the relationship between HSGPA and persistence in the original career choice. This design issue confounded the analysis of other relationships studied and will be discussed within the context of the findings.

Not withstanding, considering the analyses discussed thus far, the primary education group appears to serve as an adequate pseudo control group for the nursing students in terms of the profiles of background characteristics and their relationship to persistence. It would be anticipated that multivariate analyses will reveal similar effects of these background characteristics on persistence for those two student groups.

CHAPTER 6. THE RELATIONSHIP BETWEEN DISTANCING ACTIVITIES AND ACHIEVEMENT OF DEGREE OBJECTIVE

This study hypothesized that involvement in distancing activities -- being married, living in non-student housing, working off-campus, or working full-time -- would have a negative association with students' achievement of their degree objectives. Data from contingency analysis largely supported this hypothesis. Findings are presented in detail in Table D (see Appendix D), and are graphically summarized in Figure 4.

Astin's research (1975) found student housing to be the most important involvement factor for the persistence of all groups of college students. Holding a part-time job on campus was also found to have a positive relationship with persistence, while holding a full-time job was found to be negatively related to persistence. The findings from contingency analysis in this study for the group of students not in nursing and not in primary education concurred with Astin's findings. For the group of other students, there was greater degree and career achievement for students who lived in student housing or worked part-time on campus, and less achievement among those who worked part-time off campus, full-time, or more than 10 hours per week, or who were married in 1989.

Astin (1977), using multiple regression analysis with the 1969-1974 CIRP cohort of nursing students, did not find positive or negative associations between persistence and any of the distancing activities. Ballard (1990b), using a 1983-1987 CIRP cohort of nursing students, found marriage to be negatively related to persistence. Smith (1990) found that students reported their top reasons for not continuing in school to be interference of work with studies and demanding work responsibilities. The findings of Allen and co-workers (1988) supported those of

Astin by finding no association of persistence either with marriage or with the amount of time spent working.

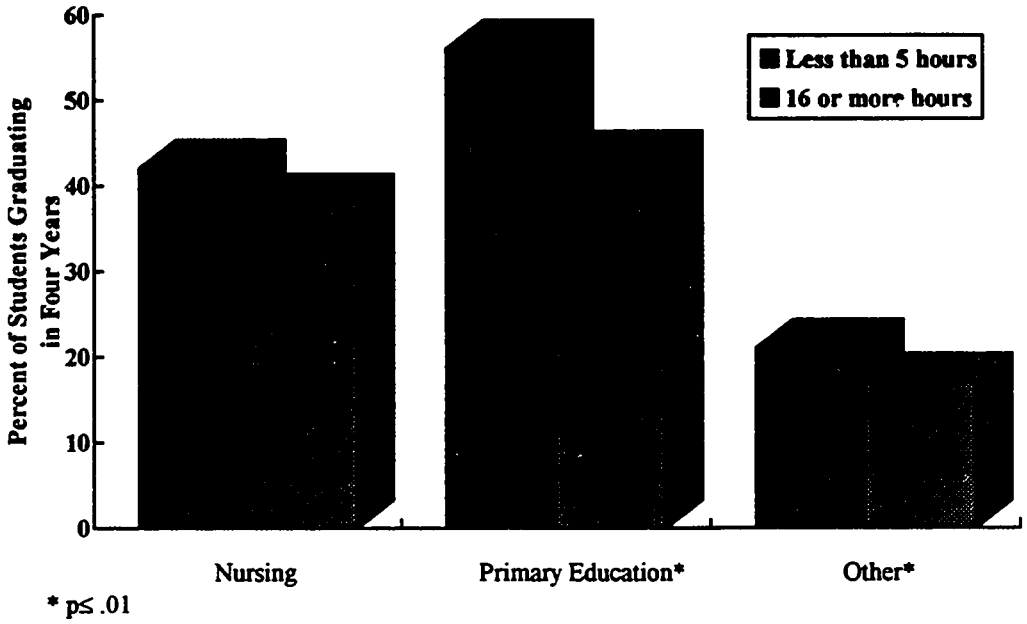
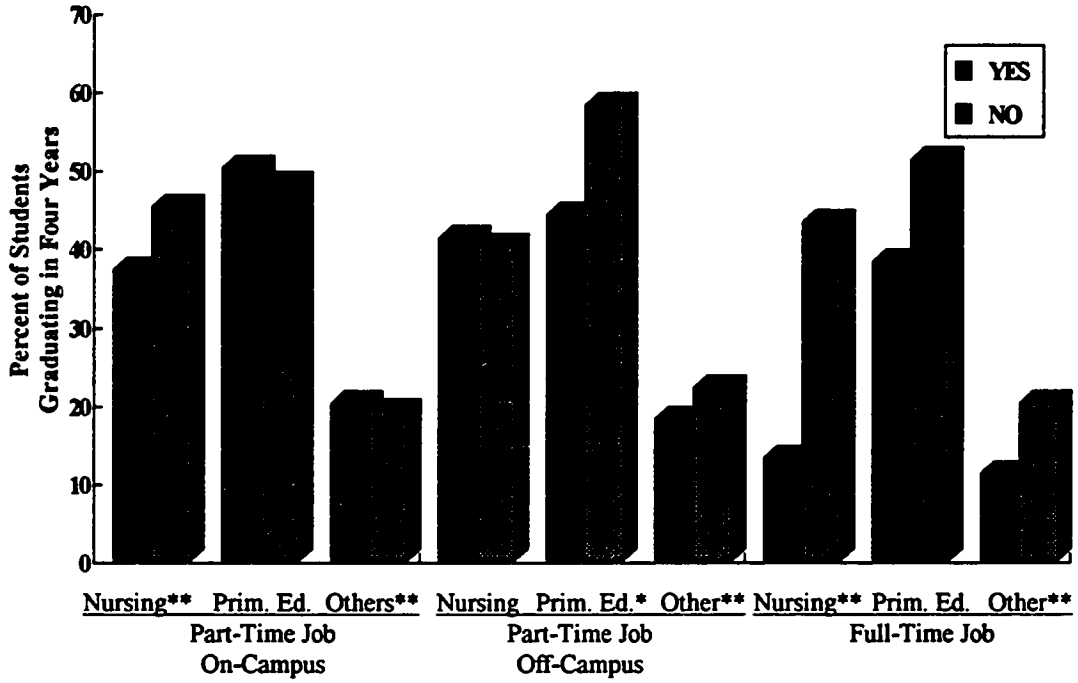


Figure 4-a. Relationship of Hours Worked per Week to Graduation in Four Years

Findings from this study supported Allen's and Astin's findings of no relationship between the amount of time spent working and persistence among nursing students. Figure 4-a reveals this study's finding of no association between persistence in nursing and the number of hours per week spent working for pay during the last year of college. This is significant, because nursing students worked more hours per week than did other students. It was also fortuitous for the nursing students that more of them held part-time jobs off-campus and fewer of them held part-time jobs on-campus or full-time jobs, since the two latter activities were related to lower degree achievement for them (see Figure 4-b). Only 13% of nursing students who worked full-time were able to graduate within 4 years, as compared to 43% of those who did not work full-time.

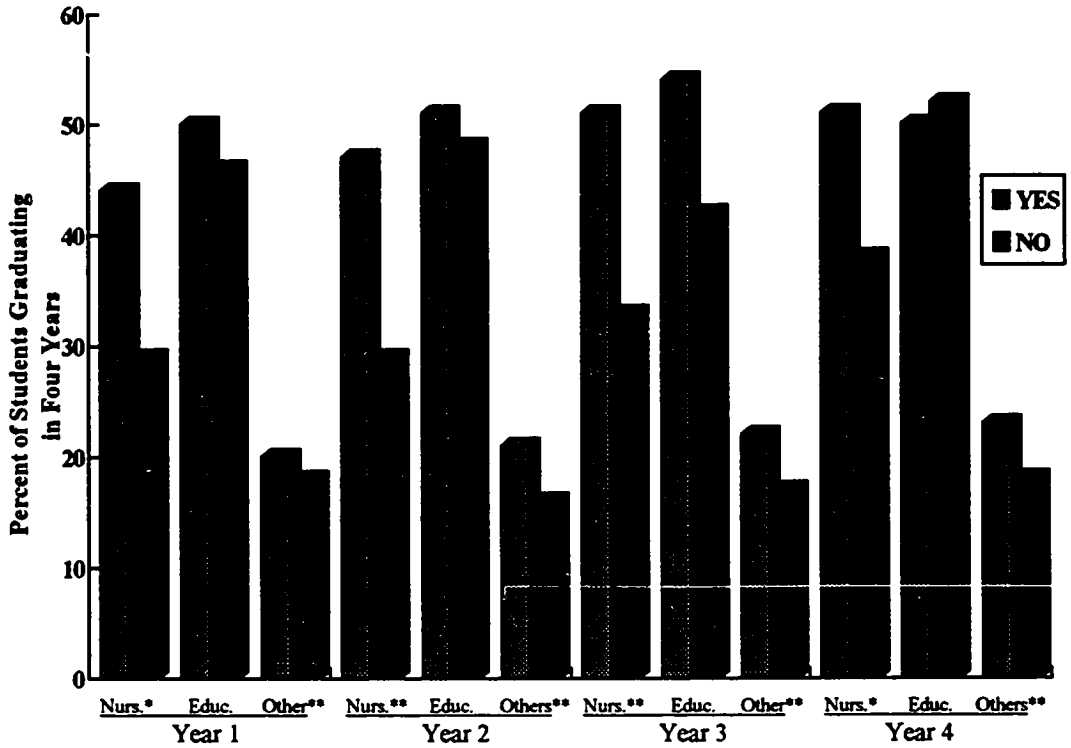


* p≤ .05
** p≤ .01

Figure 4-b. Relationship of Working while in College to Graduation in Four Years

The difference in persistence rates for nursing students who held part-time jobs on campus was less, but was also a negative relationship. This finding is contradictory to Astin's findings that generally speaking, part-time jobs on campus are positively associated with persistence. For the nursing students, only part-time jobs off-campus were not negatively related to persistence -- there was no statistically significant relationship (see Figure 4-b). Many nursing students work in hospitals during college. This type of off-campus work relates to their courses and career objective and perhaps encourages persistence in both school and the career.

The nursing students lived in student housing as often as did other students. For each of the four years of college, more of the nursing students who lived in student housing achieved their nursing degrees than did those who did not live in student housing (see Figure 4-c).

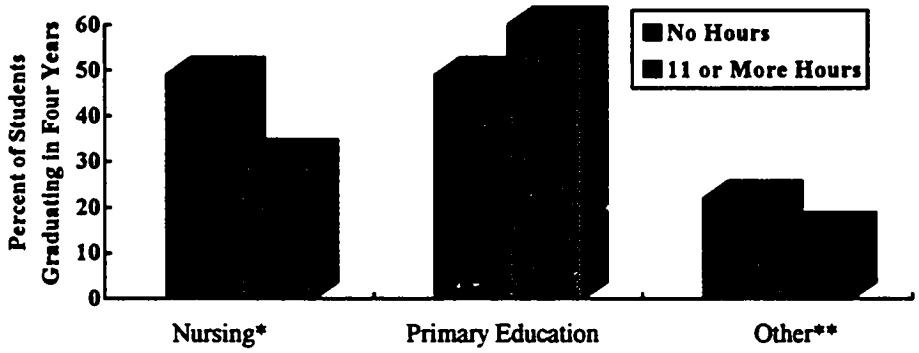


* p≤ .05
** p≤ .01

Figure 4-c. Relationship of Student Housing to Graduation in Four Years

Nursing students spent more hours per week than did other students commuting to campus during their last year of school. This finding is perplexing given that the same percentage of nursing students lived in student housing during their last year of school as did all other students. There was a negative association between lengthy commutes and persistence. From Figure 4-d, it can be seen that forty-nine percent of those students who did not commute at all during their last year of college graduated in nursing within 4 years of entering college. Of those students who spent 11 or more hours per week commuting to campus, only 31% were able to graduate within 4 years. Perhaps those students who were spending fewer hours commuting were living on campus and their greater persistence was due

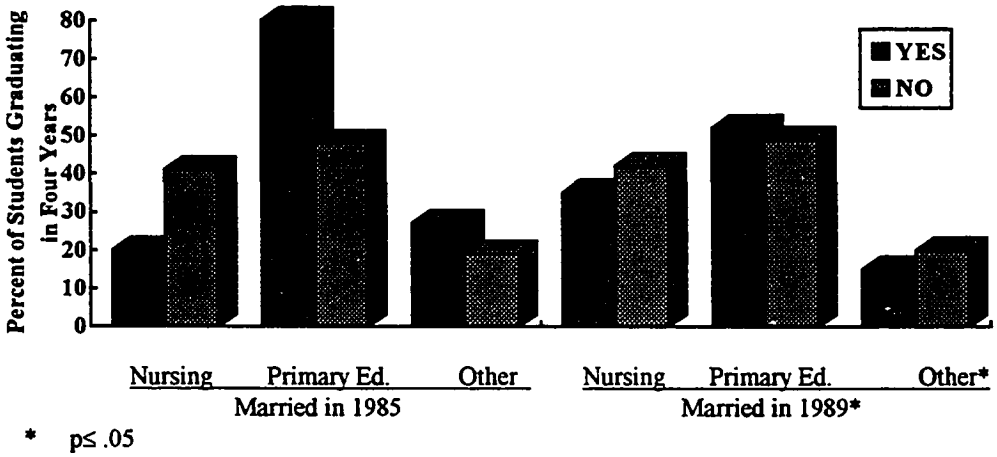
in part to their student residence. Had there been a larger sample, this relationship would have been further explored.



* p≤ .05
** p≤ .01

Figure 4-d. Relationship of Hours per Week Spent Commuting to Graduation in Four Years

This study confirmed another of Allen's findings --there was no statistically significant relationship found between persistence and marriage among the nursing students. However, in 1985 there were only five nursing students who were married. With such a small number, any findings could have been spurious. There were 43 (14%) married nursing students in 1989 and there was no relationship between their being married and their persistence in nursing (see Figure 4-e).



* p≤ .05

Figure 4-e. Relationship of Marriage to Graduation in Four Years

The students of primary education behaved less like the other students than did the students of nursing. Only two of the distancing activities were related to persistence in primary education. For primary education students, working part-time off campus was negatively associated with persistence -- 44% of those students who worked part-time off-campus graduated within 4 years, as compared with 58% of primary education students who did not work part-time. There was also a statistically significant negative relationship between hours per week spent working and persistence for this group of primary education students. Fifty-six percent of students who worked less than 5 hours per week graduated within 4 years, as compared with 43% of students who worked 16 or more hours per week. Both of these findings are consistent with the findings for the group of other students and with Astin's previous research.

Interestingly, while more of the primary education students were married than were any other students, there was no statistically significant relationship found between marriage and persistence for this group. It is also interesting that only two of the distancing activities were related to persistence in primary education while four were related to persistence in nursing and seven were related to persistence in any non-nursing or non-primary education careers. These relationships will be further explored with correlations and multiple regression analyses.

Findings for all three groups are summarized in Table 6. For the group of students who were not in nursing and not in primary education, the study's findings entirely supported those of Astin. There was greater persistence among those students who lived in student housing, spent less time commuting to campus, worked part-time on campus, spent fewer hours working, did not work full-time or off campus, and were not married in 1989. Findings for the nursing students differed in

that their persistence in nursing school (a) was not related to the amount of time they spent working, and (b) was negatively related to holding a part-time job on campus. Graduation in primary education was negatively associated with two of the distancing activities -- hours worked per week and part-time off-campus jobs.

Table 6. The Relationship of Involvement in Distancing Activities to Persistence

Distancing Activity	Nursing	Prim.Ed.	Others
Student Housing			
Year One.	*		**
Year Two	**		**
Year Three	**		**
Year Four	**		**
Hrs/Wk Commuting to Campus+	*		**
Part-Time Job On Campus	**+		**
Part-Time Job Off Campus+		**	**
Full-Time Job+	**		**
Hrs/Wk Working+		**	**
Married in 1985			
Married in 1989+			**

* $p \leq .05$
** $p \leq .01$
\+ Negative relationship

The Relationship of Distancing Activities to Involvement in Academic and Social Activities

There was a second aspect to the hypothesis involving the distancing activities -- that students who were involved with distancing activities (marriage, living in non-student housing, and working full-time or off-campus) would be less involved in academic and social activities than would be students who were not so involved with distancing activities. If a student was married, lived off-campus or worked off-campus, the student would be less likely to be involved with student groups, professor's research projects, and the other academic and social activities.

To test this hypothesis, the distancing, academic, and social activities were arranged into "scales" (described below) before contingency analysis was conducted to determine whether there were relationships between the distancing activities and the academic and social activities. The scales were logical groupings of like independent variables. Factor analysis was not done because the purpose was to determine whether these three groupings of independent variables had any relationship with the two groups of intermediate outcome variables. Findings are shown in Table 7.

Table 7. The Relationship of Distancing Activities to Involvement in Academic and Social Activities, in Percent

	Nursing		Prim. Educ.		Others	
	Acad	Soc	Acad	Soc	Acad	Soc
Married in 1985 or 1989	*	**			**	**
Employment				**	**	**
Student Housing	**	**	*	**	**	**

* $p \leq .05$
** $p \leq .01$

The academic and social activities were given equal weights and positive values in their scales. The more activities in which the student was involved the higher her sum for the scale. The distancing activities were also equally weighted and placed in three "scales". In the employment scale, the activity of working part time on campus was assigned a negative value and the activities of working full time, working part time off campus and working more than 16 hours per week were assigned positive values so that a higher sum would equate to greater involvement in the negative aspects of work (off campus, full time, and long commute). Marriage in 1985 or 1989 and living in non-student housing were assigned positive values for the same reasons.

Participation in academic and social activities was negatively associated with involvement in any of the three categories of distancing activities for the group of students who were not in nursing or primary education. It is interesting to note that although more of the primary education students were married, for them neither their persistence nor their ability to become involved in academic and social activities was negatively related to being married. Their employment status was negatively associated with their social involvement and living in non-student housing was negatively association with both their academic and their social involvement.

Living in non-student housing had a negative association with involvement in academic and social activities for the nursing students as well. More nurses held part-time jobs off campus but this relationship had no relationship with either their persistence nor their involvement in other activities. Marriage was not associated with persistence for the nursing students but it was negatively related to their involvement in the academic and social activities. Whether being involved in distancing activities contributes negatively to the student's involvement in academic

and social activities, and whether that relationship subsequently contributes to persistence will be explored in multiple regression analyses to follow in a later chapter.

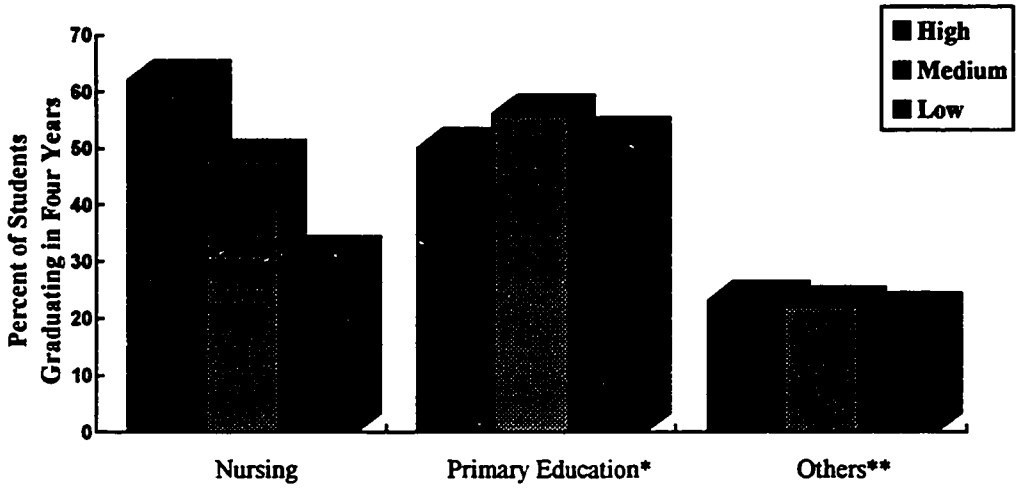
CHAPTER 7. THE RELATIONSHIP OF INSTITUTIONAL CHARACTERISTICS TO PERSISTENCE

Studying college dropout among the 1968-1972 CIRP cohort of college students, Astin (1975) found that persistence was associated with attending (a) a private university in any region or a 4-year college located in the northeastern or southern states, (b) a college with Roman Catholic or Protestant affiliation, and (c) a more selective college. For this study, it was hypothesized that degree achievement for the three groups of students would differ based on the three institutional characteristics investigated: selectivity of the college, the type of college (university vs. 4-year college), and the control of the college (public vs. private).

Although the hypothesis was not supported for the nursing and education students, Astin's findings were supported by the findings for the group of students who were not in nursing and not in primary education. Among these students, there was greater persistence among those who attended schools that were more selective, private, and had university standing. When the variables of control and type of college were merged, there were more graduations among the students who attended private universities. The associations between persistence and these variables were strengthened by the fact that more of this group of non-nursing and non-primary education students attended universities and highly selective schools. The data are presented in their entirety in Table E (see Appendix E) and are graphically presented in Figure 5.

In a later study (1982) using the same cohort, Astin found chances of completing a bachelor's degree in nursing was substantially increased by attending a selective college and substantially reduced by attending a 2-year public college. The nursing students attended less selective schools than did either of the other two

groups, but there was no statistically significant relationship between selectivity and degree achievement in nursing for the nursing students (see Figure 5-a). Selectivity was calculated from a summation of the verbal and math SAT scores for all of the students entering the college. Therefore, selectivity may be acting as a proxy for SAT scores. Selectivity also served as a measure of peer group ability.



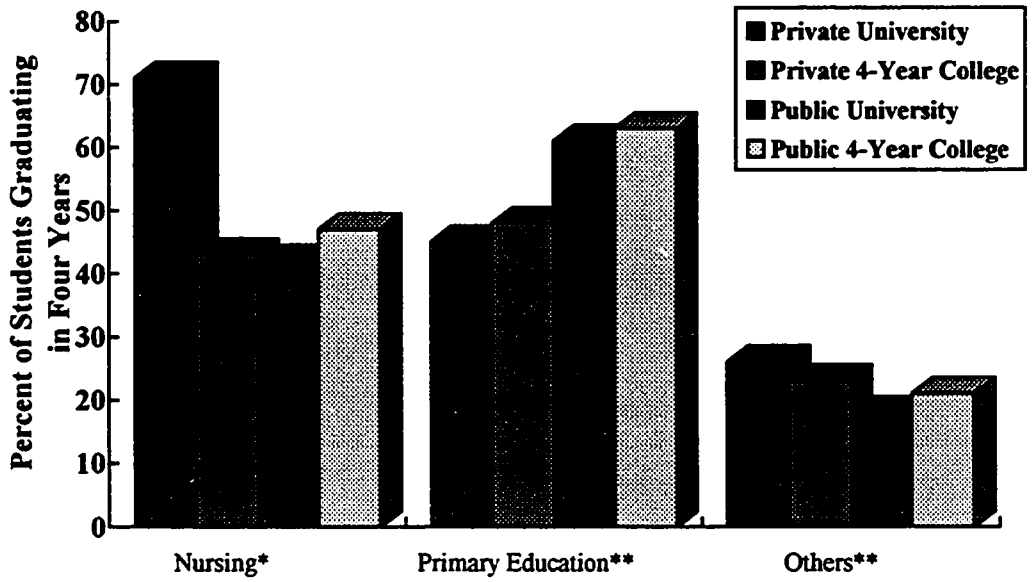
* p≤ .05
** p≤ .01

Figure 5-a. The Relationship of Selectivity to Graduation in Four Years

Attendance at a 4-year college versus attendance at a university narrowly missed having a statistically significant relationship (p=.08). Whether the school was public or private did not at all relate to persistence for the nursing students.

When the variables of control and type of school were combined, there was a statistically significant relationship demonstrating greater degree attainment in nursing for nursing students who attended private universities -- 71% graduated within 4 years -- than for any other combination of the two variables (see Figure 5-b). There were also more graduations within four years for the group of other students who attended private universities. This finding might have occurred

because of the smaller class sizes and greater resources inherent in private universities -- both factors have been found to foster greater persistence. Also, universities are more likely to be affiliated with medical centers. Proximity to a medical center may facilitate the professionalization and peer group effect for nursing students. It is unfortunate that only 12% of this group of nursing students attended private universities (60% attended private 4-year colleges, which were associated with a graduation rate of only 43%).



* p≤ .05
** p≤ .01

Figure 5-b. The Relationship of Type and Control of the School to Percentage of Students Who Graduate in Four Years

The findings for the group of primary education students were, once again, quite different from the findings for the group of other students. Graduation in primary education was associated with attending a moderate or less selective public school, whether it were a university or a 4-year college. When the variables of control and type of school were combined, there were more graduations among the

education students who attended public 4-year colleges than among those who attended private schools. This finding is not surprising given that many public 4-year colleges were originally teachers' colleges.

To summarize, findings for the group of other students conformed to the hypothesis: more students who attended schools that were selective, private, and had university standing graduated in their 1985 career choices. Findings for all three groups are summarized in Table 8.

Table 8. The Relationship of Institutional Characteristics to Persistence

	Nursing	Prim.Ed.	Others
Selectivity[a]		*	**
Public vs. Private		**	**
4-Yr College vs. University			**
Public vs. Private with 4-Yr College vs. University	*	**	**

[a] Selectivity = SATV+SATM
* $p \leq .05$
** $p \leq .01$

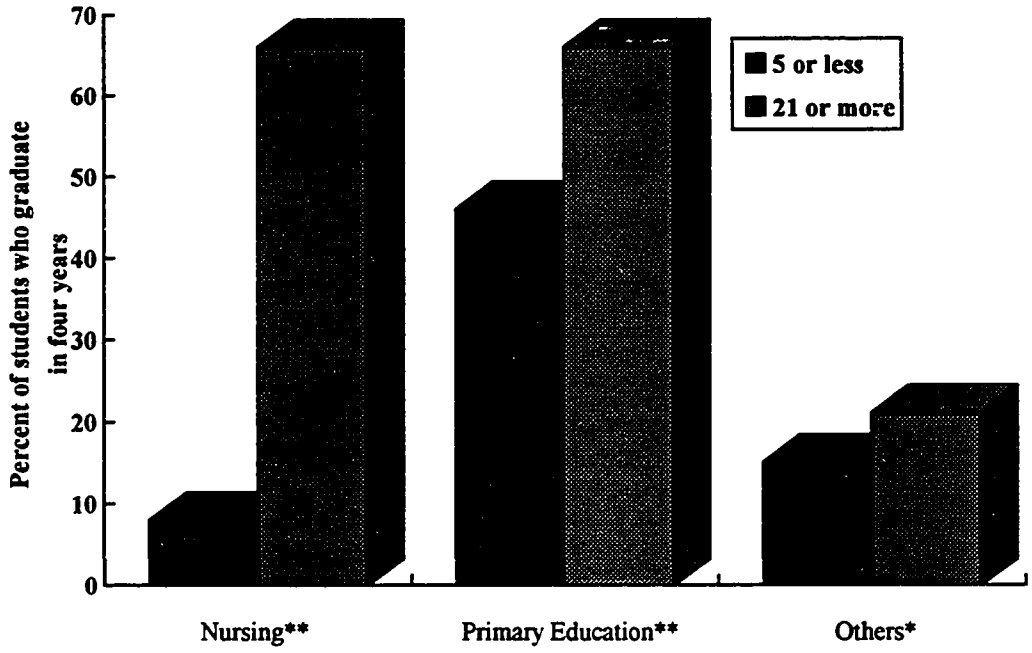
CHAPTER 8 THE RELATIONSHIP OF ACADEMIC AND SOCIAL ACTIVITIES TO PERSISTENCE

In Preventing Students From Dropping Out, Astin (1975) reported that involvement in extracurricular and academic activities contributes to students' decisions either to drop out or to persist in college. This study examined the relationship between persistence and five variables that characterize academic activities, and between persistence and five variables that characterize social activities associated with college life. A main hypothesis of this study was that students with greater involvement in the social or academic activities would persist toward degree achievement more so than those students who were not so involved. For the group of nursing students, only four of the 10 variables were found to have a statistically significant relationship with persistence in nursing. Only two of the variables were related to persistence for the group of primary education students and eight were related to persistence for the group of other students. Therefore, the hypothesis is only partially supported by the data.

Academic Activities

The data are shown in Table F (see Appendix F) and are graphically displayed in Figure 6. Astin's findings for the general student population were supported by the findings: all of the academic activities were positively associated with persistence in the original career choice for the group of students who were not in nursing and not in primary education. Students who worked on professors' research projects, assisted faculty in teaching classes, spent more time during their last year in school in the classroom, and studied and talked with faculty outside of class, experienced greater persistence than did those students who were not so academically involved.

Among all three groups of students, students who spent more time in classes and labs exhibited greater persistence than those who did not. While this finding might be expected, it is more significant for the nursing students because their curriculum demanded that they spend many more hours per week in classes and labs which they did to a greater extent than did the other two groups of students. Figure 6-a demonstrates that those nursing students who were in class 21 or more hours per week graduated within 4 years at a rate of 66% as compared with 8% for those who were in class only 5 or less hours per week, and 20% for those who were in class 6-15 hours per week.

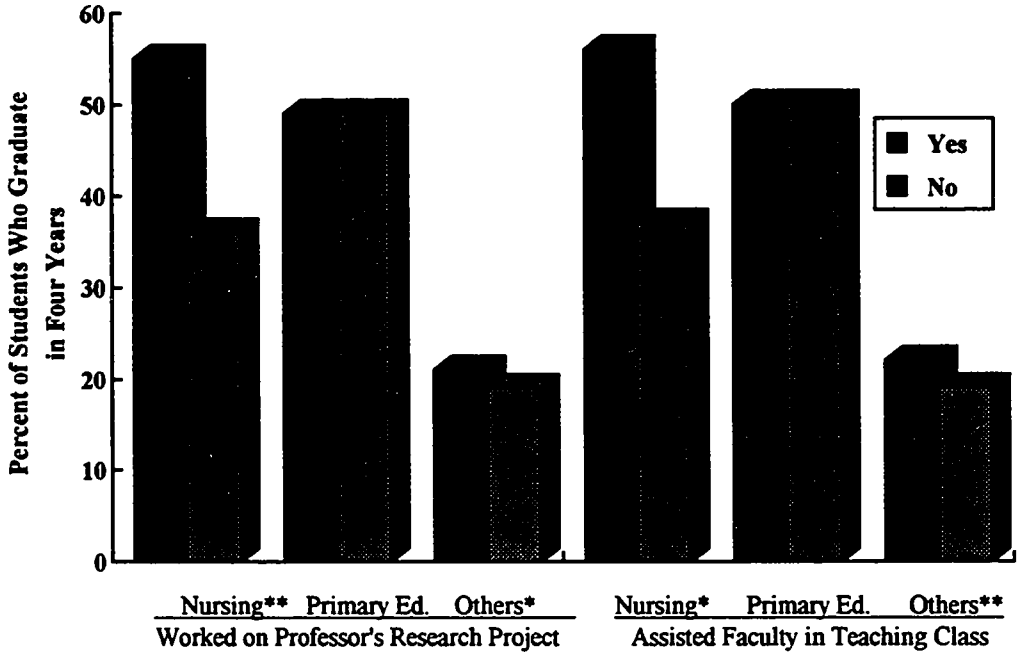


* p≤ .05
** p≤ .01

Figure 6-a. The Relationship of Time Spent in Classes and Labs to Graduation in Four Years

More students from the nursing and other group worked on professors'

research projects. These students achieved their degrees at a greater rate than their fellows -- 55% of nursing students who worked on a professor's research project graduated in nursing within 4 years, as compared to 36% who were not so involved. This finding is demonstrated in Figure 6-b, as is the finding that nursing students who assisted faculty in teaching a class also graduated in nursing within 4 years at a higher rate than nursing students who did not assist in teaching a class.

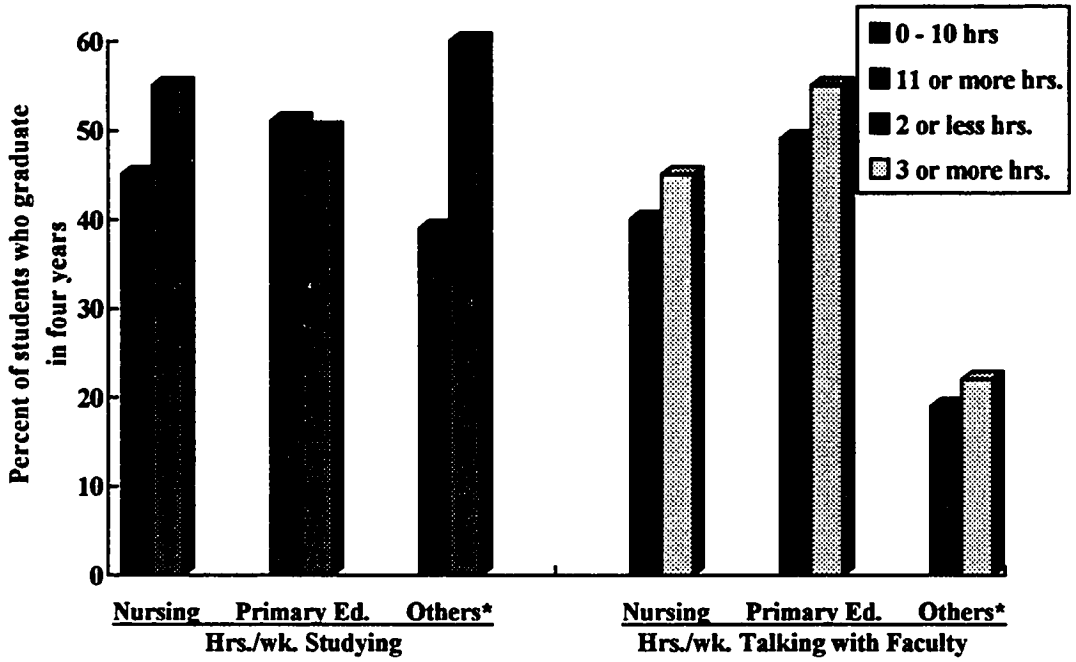


* p≤ .05
** p≤ .01

Figure 6-b. The Relationship of Working on a Professor's Research Project and Assisting Faculty in Teaching Class to Graduation in Four Years

There was no relationship between persistence in nursing and the number of hours per week the nursing students spent talking with faculty. The group that spent 3 or more hours per week talking with faculty outside of class graduated, persisted, and withdrew at rates of 45%, 11%, and 45%, respectively (see Figure 6-c). Those

students who spent 2 hours or less talking with faculty per week graduated, persisted, and withdrew at rates of 40%, 11%, and 49%, respectively. Hours per week spent studying also did not have consistent or significant relationships with degree completion for the nursing students.



* p≤ .01

Figure 6-c. The Relationship of Talking with Faculty and Studying to Graduation in Four Years

As previously mentioned, there was a positive relationship between persistence and the number of hours spent in classes or labs for the students of primary education. The other four academic activities had no relationship to persistence for this group of students. It is interesting that the results are so different for the primary education students. As discussed in Chapter 5, perhaps there was a group of high-achieving and high-involvement primary education students who

defected to alternative careers and therefore were included in the defector group. Hence the finding that involvement in academic activities was not related to persistence. Table 9 summarizes the findings for all three groups.

Table 9. The Relationship of Academic Activities to Persistence

	Nursing	Prim.Ed.	Others
Hrs/Wk in Classes/Labs[a]	**	**	*
Hrs/Wk Studying[a]			
Hrs/Wk Talking with Faculty[a]			**
Worked on Professor's Research Project	**		*
Assisted with Teaching Class	*		**

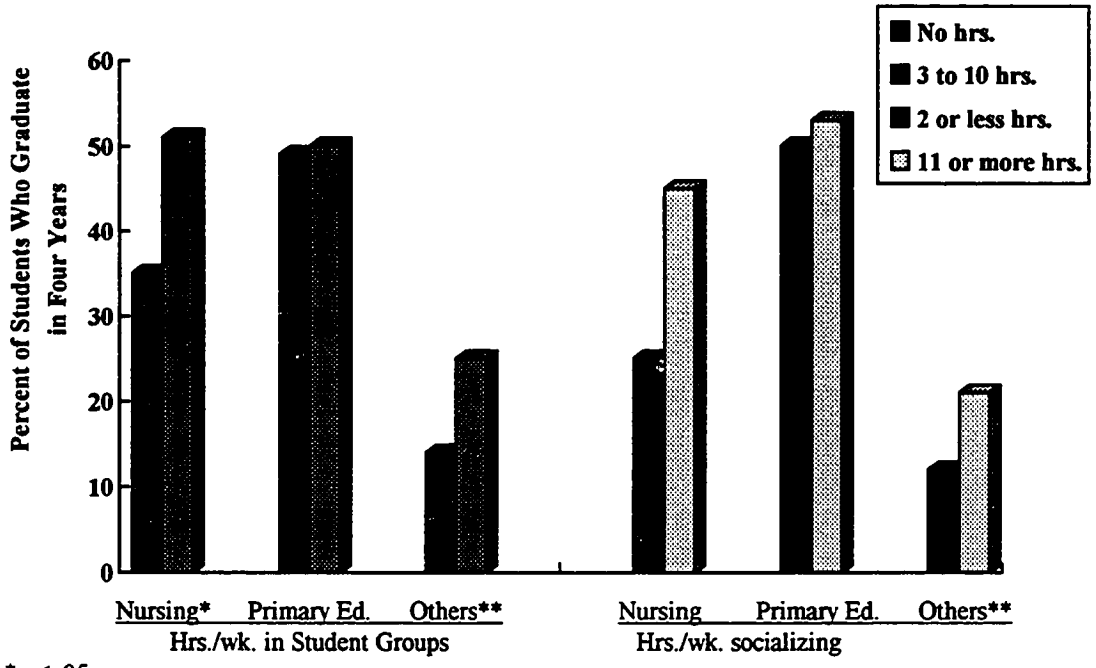
[a] During the student's last year in school
* $p \leq .05$
** $p \leq .01$

Social Activities

Involvement in social activities was largely related to persistence in the career originally chosen for the group of all other students. Significant involvement activities included being elected to a student office and spending more hours per week during the last year of school in student groups and in socializing with friends. Social activities not related to persistence for this group included participating in campus demonstrations and belonging to a sorority. Once again, the nursing and primary education students generally did not follow this pattern. Data are

presented in Table G (see Appendix G) and are graphically summarized in Figure 6.

The only activity that had a statistically significant relationship with persistence for the nursing students was participating in students clubs or groups. Generally, graduation within four years increased with increased time spent in students clubs or groups (see Figure 7-a). However, the highest category spending 11 or more hours per week in student clubs or groups was associated with a decrease in graduations in four years to 15%, 35%, and 23% for the students of nursing, primary education and others respectively.



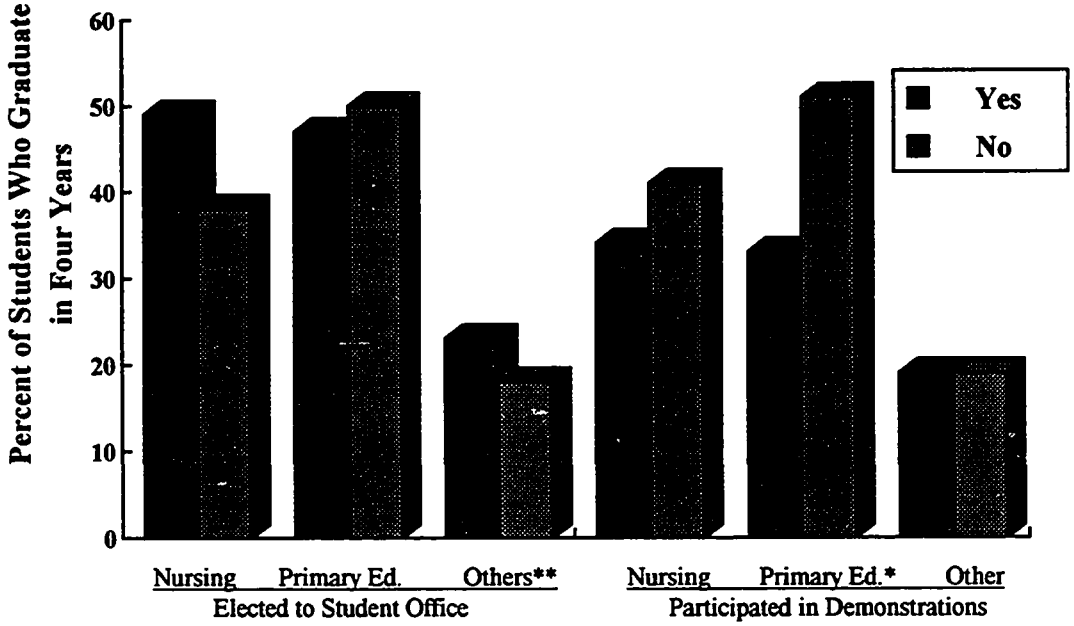
* p≤ .05
** p≤ .01

Figure 7-a. Relationship of Time Spent in Student Groups and Time Spent Socializing to Graduation in Four Years

Figure 7-a reveals that the direction and strength of the relationship between persistence and hours per week spent socializing with friends appeared to be as strong for the nursing students as for the group of other students. However, the significance level fell short at p=.10. The different rates of graduation within 4

years between nursing students who spent 2 hours or less per week socializing with friends and nursing students who spent 11 or more hours per week was 25% and 45%, respectively. For the group of other students, the difference was 12% versus 21%.

There also seemed to be a positive relationship between persistence and being elected to a student office, and negative relationships between persistence and participation in protests and demonstrations (see Figure 7-b). However, the significance levels fell short. Forty-nine percent of those nursing students elected to office graduated within 4 years, as compared to 38% of nursing students not elected. Nursing students who participated in demonstrations graduated within four years at a rate of 34%, whereas those who did not participate graduated at a rate of 41%.



* p≤ .05
** p≤ .01

Figure 7-b. The Relationship of Election to Student Office and Participation in Campus Demonstrations to Graduation in Four Years

Only one social activity, participating in demonstrations or protests, was associated with persistence for the students of primary education. Only 33% of the education students who participated in demonstrations or protests graduated within 4 years, as compared with 51% of those who did not participate in demonstrations. No other activity revealed any reasonable proximation for a relationship with persistence in primary education. Findings related to social activities and persistence for all three groups are summarized in Table 10.

Table 10. The Relationship of Social Activities to Persistence

	Nursing	Prim.Ed.	Others
Hrs/Wk Socializing[a]			**
Hrs/Wk in Student Groups[a]	*		**
Elected to Student Office			**
Participated in Demonstrations		*	
Member of a Sorority			

[a] During the student's last year in school
* $p \leq .05$
** p.01

The data for the group of other students generally supported the hypothesis that involvement in social activities was positively related to persistence in the career originally chosen. There was no difference in the degree to which nursing and primary education were involved in social activities as compared with the level of involvement of the group of other students. However, the nursing and education students had only one social activity each, out of five, that was related to persistence in those two careers. Perhaps the increased level of persistence in these two careers

in those two careers. Perhaps the increased level of persistence in these two careers is less influenced by involvement. It is also possible that for both groups a large percentage of high achievers ad high involvement students may have been in the defector group and confounded these findings. The contributions of these activities to persistence were also evaluated with multiple regression analyses. These findings appear in a later chapter.

CHAPTER 9. FINDINGS FROM MULTIPLE REGRESSION ANALYSES AND ANALYSES OF DEFECTORS FROM NURSING

Results of Multiple Regression Analysis

For the multiple regression analyses, the variables were blocked in the I-E-O format and entered in a step-wise, forward manner. The first block included the background variables and the second through fifth blocks included the distancing activities, institutional characteristics, involvement activities, and college GPA, respectively. These variables are shown in the order in which they were blocked in Table 11. The dependent variable was persistence towards both the bachelor's degree and the initial career choice with three levels: (a) withdrawal (from school or the original career choice), (b) persistence in college and in the original freshman career choice, and (c) graduation with a bachelor's degree within 4 years in the career originally chosen.

Table 11. Model of Step-wise Forward Entry
for Multiple Regression Analyses

STEP 1: Background Variables
White
Parents' income
Father's Education
Mother's Education
HSGPA
STEP 2: Distancing Activities
Lived in student housing year-1
Lived in student housing year-2
Lived in student housing year-3

STEP 2: Distancing Activities, continued

Lived in student housing year-4
Hours per week spent commuting to campus(a)
Part-time job on campus
Part-time job off campus
Full-time job
Hours per week spent working(a)
Married in 1985
Married in 1989

STEP 3: Institutional Characteristics

Private
Public
University
Four-year college
Selectivity of the institution(b)

STEP 4: Involvement Activities

Hours per week spent in classes/labs(a)
Hours per week spent studying(a)
Hours per week spent talking with faculty outside of class(a
Worked on a professor's research project
Assisted faculty with teaching a class
Hours per week spent socializing with friends(a)
Hours per week spent in student clubs/groups(a)
Elected to a student office
Participated in campus protests/demonstrations
Member of a sorority

STEP College GPA

---

[a] During the student's last year in college
[b] Selectivity of the institution = SATV + SATM

Of the 32 independent variables, seven entered the equation to predict persistence toward bachelor's degree completion in nursing. These seven variables predicted the outcome with moderate accuracy with a multiple R of .51. A multiple R is the multiple correlation coefficient which shows the simple correlation between the outcome variable (persistence) and the estimate of that outcome derived from the regression equation (all of the independent variables found to be predictors of persistence).

A beta coefficient of 0.11 corresponded to a level of significance of .05. A beta coefficient is a standardized regression coefficient. The actual magnitude of regression coefficients depends on the units in which the variables are measured. Regression coefficients are made more comparable with the calculation of BETA weights, which are the coefficients of the independent variables when all variables are expressed in standardized (Z-score) form. Standardizing the regression coefficients allows for a comparison of the relative predictive power of each independent variable. The regression table appears in Appendix G.

Of the background variables included in the first block, only HSGPA entered the equation with a beta coefficient of .26. The final beta coefficient was .12. The beta coefficient decreased significantly with the entry of two variables with which it was positively correlated --hours per week spent in class (.18) and college GPA (.50). Means, standard deviations, and intercorrelations among the variables are shown in Table G-2 in Appendix G.

Of the distancing activities included in the second block, two entered the equation. Having a part-time job on campus was the second strongest predictor of persistence with a negative effect: a simple correlation of -.16, and a final beta of -.19. A negative correlation indicated a negative relationship between the independent variable and the dependent variable. In this case, students who held

part-time jobs on campus persisted less than did those who did not hold part-time jobs on campus. This is a variation from previous research.

HSGPA, living in student housing during the third year of college, and college grades had small suppressor effects which caused the beta to increase with the entrance of those variables. The beta coefficient increased because the multiple regression equation eliminated (controlled for) the advantages enjoyed by the students who worked part-time on campus. These students had better HSGPAs, better college grades, and more of them lived in student housing during their third year of school. Controlling for these variables allows the actual relationship of working part-time on campus to degree completion to be revealed. The beta did decrease slightly with the entrance of the number of hours per week spent in classes and labs, with which holding a part-time job on campus was positively correlated.

Living in student housing during the third year of college contributed to persistence with a simple correlation of .14 and a final beta of .12. This contribution was diminished by variance shared with spending more time in classes and labs, and, to a smaller extent, by HSGPA, college GPA, and selectivity. Because fewer of these students had part-time jobs on campus and they spent less time working (two suppressor effects), the final beta was larger than it would have been otherwise.

It is interesting to note from Table G that living in student housing during the first, second and fourth years were not predictors and the third year had a much higher simple correlation. Perhaps this reflects that the largest drop in the percentage of students living in student housing was between the second and third years. Those who remained in student housing for the third year were especially benefited by that involvement.

None of the institutional characteristics included in the third block entered the equation. Of the involvement activities included in the fourth block, hours per week spent in classes and labs had the largest simple correlation with persistence and the largest final beta in the equation -- .36 and .31, respectively, which brought the multiple R to a level of .45. A correlation of .18 with HSGPA left an initial beta of .32. The beta fell slightly with each step until hours per week spent working entered in the sixth step, at which point the beta increased from .28 to .31. Hours per week spent working had a negative correlation with hours in class, and both had a positive relationship with persistence -- a suppressor effect. Controlling for hours spent working reveals the true contribution of hours spent in class.

The fifth block included only college grades, which had a simple correlation of .25. The initial beta was only .16 because the correlation between college grades and HSGPA was high -- .50. Subsequently the beta fell slightly to a final beta of .14.

A sixth block, which specified no variables, provided the opportunity for any variables that had been suppressed in previous blocks to show their true predictive value. Two variables entered in this step -- hours per week spent working and selectivity of the institution. Hours working had a simple correlation of only .06, but the beta coefficient increased with most steps and did not decrease with any step. Hours per week spent working had a suppressor effect on three variables that had previously entered the equation. As Astin (1991) noted, "the suppressor effect is always symmetrical in the sense that controlling either independent variable will strengthen the correlation between the other and the dependent variable." The factor of hours spent working during the last year of school contributed positively to persistence. That contribution was strengthened when the other variables were controlled (more worked part-time on campus, fewer lived in student housing during the third year, they spent less time in class, and attended less selective colleges).

The final variable to enter the equation was selectivity of the college, which had a simple correlation of .16. The beta fell to .13 with the entry of HSGPA in the first step and had a final beta of .12. The final multiple R was .51.

Contingency analyses (presented in previous chapters) showed several variables to have relationships with persistence in nursing. Student housing in all 4 years, time spent commuting, having a full-time job, working on a professor's research project, assisting with teaching a class, and time spent in student clubs were such variables. The simple correlations and beta coefficients of several of these variables are shown in the regression table as variables not in the equation. From this table it can be seen that, in general, parents' income, student housing, and assisting with teaching a course all had small simple correlations with persistence and lacked suppressor variables to a degree that would bring their beta coefficients to the significant magnitude of .11.

Holding a full-time job had a simple correlation of -.18, which meant that holding a full-time job had a negative impact on persistence. At step three, the beta was still .12, but it fell to -.06 with the entry of hours per week in class with which it shared variance. Working on a professor's research project had a simple correlation of .11, but sharing variance with five other variables left a final beta of only .05.

Nursing students spent approximately 40% more hours per week commuting, and that variable appeared to have a moderate relationship with persistence in contingency analysis. The simple correlation with persistence was only -.09 and it fell to a final beta of -.06. More nurses held part-time jobs off campus than did other students and there appeared to be a positive relationship with persistence with contingency analysis. However, the simple correlation was only .07 and the final beta was -.02 (the effect became negative after controlling for the positive effect of hours worked). Attending a university had a moderate relationship with persistence

in contingency analysis. The simple correlation was .11 but the final beta was only .04 after a drop from .09 with the entry of selectivity in the final step (universities being more selective than 4-year colleges).

As expected, based on the number of significant relationships found in the contingency analyses, many more of the variables predicted persistence for the students who were not in nursing and not in education, i.e., the other group (see Table G-4 in Appendix G). The 12 variables predicted bachelor's degree completion and maintenance of the original career choice (other than nursing and primary education) with minimal accuracy -- the multiple R was .15. The prediction by these variables was less than twice as accurate as the same variables' prediction for the nursing students, in part because the persistence rate (maintaining the career chosen in 1985 and graduating in 4 years or planning to enroll for a fifth year) of the group of other students was half that of the group of nursing students --23% vs. 51%.

None of the SES variables (parents' income or parents' education) entered the equation and all of the SES variables had minimal simple correlations with the dependent variable (see Table H-4 in Appendix H). HSGPA, the only other variable in the first block, had the highest simple correlation and the largest final beta -- .11 and .08, respectively. HSGPA was fairly constant until college GPA entered the equation in step 12, at which point the beta for HSGPA fell to .08. College GPA, which was actually the last variable introduced (the only variable in the fifth block), had the second largest final beta: .05. The beta for college grades decreased only once, from .09 to .05, with the entry of HSGPA in the first step. Not surprisingly, these two variables had the highest correlation among the independent variables: .47.

Between these two extremes, in placement and in predictive power, fell the distancing activities, characteristics of the institution, and academic/social activities

which had been introduced in the second, third, and fourth blocks, respectively. In general, beta coefficients were relatively stable and, with the exception of HSGPA and college grades, changed little from their simple correlation to their final betas. Variables related to each type of distancing activity (work, marriage, and student housing) entered the equation, although not always with the direction of relationship that would support Astin's theory.

For example, being married in 1985 was a positive predictor, but being married in 1989 was a negative predictor. This finding is likely the result of artifact. It would be expected that if being married in 1989 was negatively related to persistence then being married in 1985 would be even more negatively related. Whether being married distances the student from college activities and deters from persistence requires further exploration.

Full-time jobs contributed negatively to persistence, as did, surprisingly, part-time on-campus jobs. Also contrary to Astin's earlier findings, living in student housing during the first year of college negatively contributed to persistence, while living in student housing in the third year of college was a positive contributor.

Of the institutional characteristics -- type, control and selectivity -- only private colleges were found to be predictive of persistence for the group of other students. Of the 10 social and academic activities, only hours per week spent in clubs and hours spent studying positively predicted persistence. Participating in demonstrations and protests contributed negatively to persistence.

A few other variables warrant discussion. Being White had a small negative simple correlation. It did not gain enough from suppressor effects to make it significant, but neither did it change its sign. Three variables -- living in student housing during the fourth year, selectivity, and being elected to a student office -- had larger simple correlations with persistence (greater than .03), but their betas

decreased to insignificance with the entry of HSGPA, with which they shared variance. It is interesting to note that once HSGPA was controlled, selectivity and being White were negative predictors of persistence.

With contingency and multivariate analysis of persistence, the students of nursing did not behave as hypothesized as much as did the group of other students. The group of primary education students were the most different (in terms of which variables predicted their persistence) in contingency analysis and also in multivariate analysis. Only two of the variables included in the analysis predicted persistence toward a bachelor's degree in primary education. The two variables contributed to a final multiple R of 0.27.

Having a part-time job off campus had a simple correlation of -.17. The beta was higher, at -.18, after controlling for attendance at private schools. Both the simple correlation and the final beta of private school was -.20. Hours per week working and participating in demonstrations were the only variables that had sizable simple correlations. Those correlations were negative and fell to insignificance when the two predictive variables entered the equation.

It is interesting to note that while primary education students persisted in their original career choice slightly more than did the nursing students -- 58% either graduated within 4 years or planned to re-enroll for a fifth year -- the multiple R was much smaller. Perhaps the variables studied are less related to persistence for the primary education group than for other students. That is, there must be other background characteristics or experiences, institutional variables, college experiences, or other factors that predict persistence for the primary education students.

More likely, as mentioned in previous chapters, there was a group of high-ability and high-involvement primary education students who defected to other

careers. This situation therefore confounded the dependent variable by having high ability involvement students in both the highest and lowest levels of the dependent variable: graduated in four years and defected. Had the defectors who persisted in another field been left out of the sample the findings would not have been confounded in this way.

Discussion

Findings from the multiple regression analyses are generally unconnected, contradict previous research and vary greatly among the three student groups. This may have been due to the situation described above which might have caused confounding of the findings for all three groups. There were a few instances in which data were logical and confirmed previous research.

Previous research supporting a positive association between high school grades and college grades and persistence is voluminous. This study did find HSGPA and college grades to contribute to persistence for the students of nursing and the group of other students. High school and college grades were not, however, found to predict persistence for the students of primary education. Given the greater number of variables that entered the equations to predict persistence for the groups of nursing and other students, it is perplexing that only two variables predicted persistence for the students of primary education: holding a part-time job off campus and attending a private college were both negative predictors. Attendance at a private college is usually associated with greater persistence. The results for the primary education students were probably confounded, as previously discussed.

The SES variables of parents' income and education were not found to be related to persistence for any of the student groups. This finding partially supports

Astin's findings (1975): parents' education was predictive of persistence but parents' income was not (partly because it shared variance with academic aptitude and parents' education). Most studies of nursing students do not find a relationship between persistence and SES, and suggest that much of the impact of SES is shared with aptitude and race, of which aptitude was found to be a predictor. In contradiction to those studies, being White did not contribute to persistence for any group in this study.

Also in conflict with Astin's findings were the findings from this study that persistence was negatively related to (a) holding a part-time job on-campus for the nursing and other students, (b) living in student housing during the first year of college for the other students, and (c) attending a private university for the primary education students. Additional findings that were also somewhat inconsistent with previous research: persistence was positively related to (a) the number of hours worked per week by the nursing students and (b) being married in 1985 for the group of other students.

A few findings did not contradict previous research. The persistence of nursing students was related to spending more hours in classes and attending more selective schools. The persistence of the group of other students was positively related to attending a private college, being more involved in student clubs, and spending more time studying; and was negatively related to holding a full-time job and attending campus protests and demonstrations.

It would seem that the variables that involved greater academic involvement should have induced greater persistence for all of the student groups: spending more hours in class would be associated with greater persistence for the other students as it was for the nursing students; spending more time studying would be associated with greater persistence for the nursing students as it was for the other

students; and that both activities would be associated with greater persistence for the primary education students. The differences in the results for each group might have logical explanations.

The ability of hours per week in classes and labs to predict persistence only for the group of nursing students may reflect the nursing effect. That is, there was something qualitatively different about the time spent in classes and labs for the nursing students. Additionally, there was a correlation of -.21 between hours spent working and hours spent studying for nursing students. If some of these students were working in hospitals, the time spent working would also have contributed to their clinical skills and compensated for the fact that they were spending less time studying.

Once again, results for the primary education and other students might have been confounded by having high ability/involvement students on both ends of the continuum of the dependent variable. Analysis of the defectors from nursing (see next section) reveals the nursing group was probably not affected by this situation. The students who defected from nursing and persisted in another career had lower grades than did the students who persisted in nursing. More of the high ability students were those students who graduated in four years and fewer were defectors who persisted. Therefore, the high ability students were concentrated at the higher level of the dependent variable -- graduation, and fewer were in the lower level -- defectors. Confounding of the dependent variable with high ability students at opposing levels did not occur.

Defectors from Nursing

In Chapter 5 it was demonstrated that only 40% of those students who began college with degree-oriented career choices of nursing achieved their bachelor's

degrees in nursing in 4 years. A second group, which comprised 11% of the freshman nursing students, had not yet earned bachelor's degrees but planned to enroll in the Fall of 1989, maintaining their majors and career choices in nursing. Combined, the two groups are considered the persisters in nursing in this study and they represent 51% of students who began with the career choice of nursing. A third group of students were defined as (a) those who had not earned the bachelor's and were not planning to enroll in 1989, and (b) those who left nursing, regardless of their subsequent degrees or career achievements. These three groups comprised the three levels of the dependent variable, persistence.

The third group, called defectors, accounted for 49% of those who entered their freshman years as students of nursing. One purpose of this study was to examine the defectors' career and degree outcomes and to explore whether there were commonalities among members of the group. Of the 177 defectors from nursing (49% of the 354 women who started in nursing in 1985), 128 either graduated or persisted in another career, and 49 withdrew from school.

Contingency analysis, using Chi square as the test of statistical significance, was done to discover whether the group of students who persisted in nursing differed from the group of students who defected to alternate careers and persisted in them. All of the variables related to background characteristics, distancing activities, characteristics of the institution, social and academic activities, and college grades were included in the analysis. Table 12 summarizes the results of the analysis.

Some variables might have contributed to the defection, and some occurred subsequent to experience in the new career and major. At the time of entry to college, the defectors had lower HSGPAs, they attended less selective schools, and fewer entered universities.

Table 12. Characteristics of Nursing Defectors Compared to Persisters

Variable	Significance Level
Lower HSGPA	.01
More worked part-time on campus	.01
More worked full-time	.01
Fewer attended universities	.05
Attended less selective schools	.05
Spent less time in classes and labs	.00
Spent more time in student clubs	.01
Lower college GPAs	.05

Note: There were approximately 177 nurses and 128 defectors in each analysis.

The defectors held more part-time jobs off campus and more full-time jobs. In previous analyses, nursing students had been found to work more part-time jobs off campus as well. Nursing students had also been previously shown to spend more time in classes and labs than other students, and to spend less time in student groups. Therefore, it is no surprise that the defectors experienced the opposite involvement pattern.

Lower college grades were anticipated, given that the defectors had lower HSGPAs and that the two variables are highly correlated. It might be hypothesized that the students left the nursing major for courses of study that were less academically rigorous. It was therefore of interest to examine the careers to which these students successfully defected.

The largest portion of defectors chose careers in education -- 20% (mostly primary education). This is not surprising, given that students of nursing and primary education were found to be similar with respect to SES, previous academic achievement (HSGPA), and sex-role identity. Many chose to become different

kinds of health professionals -- dieticians, lab technicians, therapists -- careers which cumulatively took 17% of the defectors. The third largest migration was to social work, which took 14% of the defectors. Twelve percent of the defectors marked the "other" category for career choice, and the remainder of defectors chose from among the remaining career options.

The career that absorbed the greatest number of successful defectors was education. It is not surprising that these defectors from nursing chose this alternative career that was comprised of individuals similar to themselves. It is also not surprising that many defectors were successful in alternative careers in other helping professions such as social work and other health professions. Suggestions for further research in this area are in the final chapter.

CHAPTER 10. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

There exists a serious shortage of nurses prepared at the baccalaureate, master's, and doctoral levels. Attrition of students from baccalaureate nursing programs contributes to this shortage. College attrition has been found to be associated with students' race, academic abilities and SES. It was therefore of concern that nursing students have lower HSGPAs, come from families with lower SES, and have a growing proportion of minority students. In addition to these factors traditionally associated with attrition, Alexander Astin has documented a positive relationship between students' involvement in their college experiences and their persistence in college.

In considering the relationship between involvement in college and persistence for baccalaureate nursing students, it must be noted that college involvement patterns for nursing students differ from the involvement patterns for most other college students. The literature indicates that a greater proportion of nursing students, compared to other students, are married, work off campus, and live off campus. These factors were suspected of distancing the nursing student from mainstream campus activities and limiting their opportunities for involvement with other students and college life.

Despite the fact that nursing students are more engaged with distancing factors and that they have more disadvantaged background characteristics than do many other student groups, they have higher persistence rates (persistence towards a degree in the initial career choice) than do students of most other majors. Nursing students spend more time in lecture and laboratory classes together, apart from other students. In some respects they have greater academic involvement than do

many other students. The experiences shared by nursing students may be more challenging and emotionally demanding than the experiences shared by students in other majors. It was hypothesized that sharing the extra hours and unique experiences might create a special group cohesion or nursing effect which encourages the greater persistence among the nursing students.

Baccalaureate students of primary education are remarkably similar to students of nursing with respect to their academic abilities, SES, and sex-role identity. Yet, while there are similarities between nursing and primary education students with respect to background and personal characteristics, the curriculum for primary education does not have the intensity of hours required as does the nursing curriculum. Therefore, students of primary education were compared with students of nursing to add an element of control for the background characteristics which they had in common.

The data used for this study were drawn from the Cooperative Institutional Research Program (CIRP) 1985 Freshman Survey and 1989 Follow-Up Survey (FUS). The Freshman Survey, which exists in the form of a four-page Student Information Form (SIF), asks for a wide range of demographic data as well as information on students' high school backgrounds and educational experiences, career plans, opinions on a wide range of political and social issues, values, and self-perceptions. There are data pertaining to the institution: type, selectivity, geographic region, racial mix, and other information.

The purpose of the longitudinal follow-ups is to assess student experiences and achievements during the undergraduate years and to determine how different kinds of college environments influence student development. The FUS includes many of the same areas of questioning as the SIF, thus providing a sort of pre-test and post-test profile. Additionally, there are questions pertaining to the college

experience: satisfaction, participation in academic and extracurricular activities, years of college, reasons for stopping out or dropping out, and plans for, or report of, degree attainment and career choice (see Appendix A for a copy of the SIF and FUS).

From the 288,432 freshman who completed the survey in 1985, 192,453 were first-time, full-time freshmen from 365 institutions included in the normative sample published in The American Freshman: National Norms for 1985. Not all 192,453 students in the normative sample were included in the follow-up study. The 1989 follow-up data were requested in five different sampling groups from 91,164 of the 1985 normative sample of freshmen. The sample used for this study utilized two of the five sampling groups. Stratified random sampling selected 20,317 students and an additional 34,323 were from 53 institutions that agreed to participate in the follow-up as part of the Exxon Foundation Study.

Of the random and Exxon combined sampling groups of 54,640 surveyed, 18,887 responded. Of those, 10,755 were women who attended a four-year college or university. This additional limitation was placed because there exists great variation in student outcomes, especially regarding persistence, between students who attend 2-year and 4-year colleges (Astin, 1982). Because this study focused on completion of baccalaureate education, the sample included only those students attending 4-year colleges or universities. The sample size for each student group under study were as follows: nursing, 354; primary education, 537; and all others, 9,855.

Contingency analyses and multiple regression analyses were done to determine whether factors influencing persistence for baccalaureate nursing students were: (a) traditionally associated with attrition, (b) related to Astin's

involvement theory of persistence, or (c) similar to factors that were significant for other college students or for students of primary education.

Summary of Findings

Findings From Contingency Analyses

The findings from contingency analyses were difficult to interpret for the groups of other and primary education students because of the problem of high ability students confounding the dependent variable. Many of the factors hypothesized to be related to persistence were in fact associated with persistence in the original career choice for the group of other students. Several of the relationships hypothesized for the nursing group were supported in the data. Findings for the group of primary education students were much less consistent with the hypotheses. These findings will be discussed within the context of each hypothesis.

Hypothesis #1

Freshman students of nursing and primary education, as opposed to all other students, will be similar with respect to HSGPA, and variables related to SES and sex-role identity.

Students of primary education were used as a comparison group to control for characteristics that were thought to be common to students of nursing and primary education. HSGPA, parents' income, and sex-role identity were found to be similar for students of nursing and primary education and to distinguish them from all other students. For the students of primary education, both parents' educations were higher and there was a stronger goal of raising a family; otherwise, this hypothesis was supported. The students of primary education were appropriate as a control group.

Hypothesis #2

The background characteristics of race, SES, and HSGPA, which influence persistence for students in general, will have similar influences on students of nursing and primary education.

The contingency analyses revealed relationships between the background variables and persistence only for the group of other students.

Hypothesis #3

Characteristics of the college which have previously been found to be related to persistence for students, generally, will similarly influence persistence for the students of nursing and primary education.

Attendance at more selective private universities was found to be related to persistence for the group of nursing students and for the group of other students. However, attendance at less selective public 4-year colleges was found to be related to persistence for the group of education students. This is probably due to the fact that these colleges were formerly teachers colleges. Therefore, this hypothesis was partially supported.

Hypothesis #4

Students with higher levels of participation in academic and extracurricular activities will persist more than will students who participate at a lower level.

Seven out of 10 activity variables (notably variables related to student housing, employment, marriage and hours studying and in student groups) were found to be related to persistence for the group of other students (although the relationship was not always in the direction anticipated). There were relationships between four of the activity variables and persistence for the nursing students. Only two of the 10 variables were related to persistence for the students of primary

education. Therefore, the hypothesis was not confirmed consistently, but there was some partially supportive data..

Hypothesis #5

Students who are committed to a distancing activity (being married, working off-campus or full-time, and/or living in non-student housing) will have less involvement with the academic and social activities than will students who are not involved with distancing activities.

Living in student housing was related to involvement in both academic and social activities for all three student groups. Marriage was related to involvement in both academic and social activities for only the nursing and other students. Employment was related to both academic and social activities for the other students and only to social activities for the primary education students. Employment was not related to involvement in academic or social activities for the nursing students. This hypothesis was generally supported although there were variations in findings among the groups.

Hypothesis #6

Distancing factors will have a negative impact on persistence for all three student groups. Among students of nursing and primary education there will be more withdrawal associated with being married, because more of these students are married. The impact of off-campus or full-time jobs will be greater for nursing students because more of them engage in these activities.

Although more nursing and primary education students than other students were married in both 1985 and 1989, there was no relationship between persistence and marriage for these groups. There was a lower persistence rate among those students in the other group who were married in 1989.

There was no difference among the three student groups in the numbers of students who held full-time jobs. Full-time employment was negatively related to persistence for the nursing and other student groups. More nursing than education or other students did hold part-time jobs off campus, but the effect was not negative. Holding part-time jobs off campus had no relationship with persistence for the nursing students and a small negative relationship for the primary education and other students. Holding a part-time job on campus had a small negative relationship with persistence for nursing students, a small positive relationship for other students, and no relationship with persistence for students of primary education. Hours per week worked had negative relationships with persistence for primary education and other students and no relationship with persistence for nursing students.

Living in student housing for each of the 4 years had a positive relationship with persistence for the nursing and other students and no relationship with persistence for the primary education students.

Overall, this hypothesis was partially supported because of the relationship between student housing and work, and persistence for the nursing and other students. However there were only two variables that had the relationships with persistence for primary education students.

To summarize the findings of contingency analyses, the students of nursing and primary education were found to be similar with respect to background variables; these background variables had similar relationships to persistence for both groups of students. However, there were significant differences between the education and nursing students in the relationships between persistence and the institutional, involvement, and distancing variables studied. Using the group of

primary education students as a control group for the nursing students no longer appeared to be reasonable given these differences.

The non-nursing and non-primary education students generally had the predicted relationships between variables and persistence which supported the hypotheses, and the students of nursing were much more similar to the other students than were the students of primary education. Looking specifically at the results of contingency analysis for the nursing students, it did appear that there were associations between each set of variables and persistence.

Findings from the contingency analyses varied considerably by student group. Relationships between the independent variables and persistence were not always in the directions that would be expected or that have been reported in the literature. Multivariate analyses were conducted to attempt to sort out the discrepancies and discover which variables indeed contributed to persistence for each of the three student groups.

Findings From Multivariate Analyses

Multivariate analysis found fewer variables contributed to persistence than did contingency analysis. This was true for all groups of independent variables. The final hypothesis, hypothesis #7, was addressed by multivariate analysis.

Hypothesis #7

Education students will have lower persistence rates than the other two student groups, due to the negative effects of their background characteristics and their greater engagement with distancing activities than will all other students. Nursing students will have the highest rate of persistence, despite their background characteristics and involvement with distancing activities. Their increased

persistence will largely be a factor of their increased hours in classes and labs. However, the rate of persistence will be higher than could be explained by their increased hours in classes and labs alone. The unexplained variance will be greater than the unexplained variance for the students of education and all other students. This increased portion of unexplained variance is the nursing effect.

This hypothesis was not supported. The primary education students did have lower grades and were from families with lower incomes than were other students (except nursing students, who were slightly lower on both variables). However, these variables did not enter the regression equation for the primary education students and, therefore, did not predict their persistence. Marriage was the only distancing variable with which the primary education students were more engaged than the other students. Although more primary education students were married, that variable also did not predict their persistence. Primary education students had no more part-time jobs off campus than did the other students. However, this variable negatively predicted persistence for the primary education students.

Nursing students did not have the highest rate of persistence -- primary education students had a slightly higher rate of persistence. When students who graduated within four years and students who persisted in their original career choice were considered together, the students of primary education had the greatest combined persistence (58%), as compared with the students of nursing and all other students, whose persistence rates were 51% and 23%, respectively. It should be remembered that remaining in the career chosen in 1985 is included in the operationalization of persistence. Although 49% of the nursing students did not persist (i.e., they defected or quit school) the nursing career had a much stronger holding power than did the careers that were non-nursing and non-primary education -- 67% defected to other careers or quit school.

Although the students of nursing had the least educated parents and came from families with lesser incomes, these background characteristics also did not contribute to their persistence. Students of nursing had the lowest HSGPAs and, not surprisingly, this background variable did predict persistence for them.

More nursing students than education or other students had part-time jobs off campus and they spent more hours per week working. It was hypothesized that the nursing students would have higher persistence rates in spite of their greater involvement in these distancing activities. The nursing students' employment situations did predict their persistence, but in directions and with variables other than had been hypothesized. Holding a part-time job on campus was a negative contributor to persistence for the nursing students. Perhaps these students were drawn to other fields of study by their co-workers or by the nature of their on-campus jobs. Hours per week spent working was a positive contributor. The significance of these findings will be discussed later in this chapter. There was no difference in the incidence of living in student housing for the three groups. Living in student housing during the third year contributed to the persistence of the nursing students.

As was hypothesized, of the variables studied, hours per week spent in classes and in labs during the last year of school was the greatest contributor to persistence for the nursing students. It was also hypothesized that the increased rate of persistence, and the increased amount of unexplained variance for the regression equation (increased over the amount found for the other two groups), would be due to the immeasurable "nursing effect." This hypothesis was not supported. The r squared explained more of the variance for the nursing students than it did for

either the primary education students or the other students -- .26, .07, and .02, respectively.

As the data emerged, it became evident that hypothesis #7 was not applicable to this study -- it did not make sense given the variables that were entered in the equation to predict persistence. Only those variables that related to the purpose of the study were included in the regression equation, i.e., variables that related to SES, academic performance, distancing activities, a few institutional characteristics, and involvement activities. It would make sense to label the portion of missing variance for the nursing students as the nursing effect only if every other variable that contributed to the variance was included in the equation. It was not the goal of this study to discover every variable that contributes to persistence for nursing students. Further, it must be recognized that all of the variables are not known. Additional research is needed to build on what is now known about factors that contribute to persistence for baccalaureate nursing students.

Relatively few variables predicted a relatively large amount of variance for the nursing students and the primary education students. Persistence towards baccalaureate degree achievement in nursing was predicted by HSGPA, holding a part-time job on campus (negative relationship), living in student housing during the third year of college, hours spent in classes and labs, college GPA, hours spent working, and selectivity of the college. Persistence towards baccalaureate degree achievement in primary education was predicted by two variables that were negatively related to persistence: working full time and attending a private college. The results of multiple regression analysis for the students of primary education and other students may have been confounded by a group of high ability and highly involved students who defected by persisted in another field, as was discussed in Chapter 9. These variables, or variables with which they share variance, are robust

predictors of persistence for these student groups. A discussion of the intricacies and implications of the findings of contingency and multivariate analyses follows.

Conclusions

Background Characteristics and Persistence

Contrary to the findings of other researchers, SES (as measured by parents' income and education) and being White were not predictors for persistence for the nursing students, even though they came from lower SES families. The representation of minority students and students from families with lower SES entering nursing school is increasing (Williams, 1988). It is reassuring that these variables did not contribute negatively to persistence in this study. However, the lack of a relationship might have been due to the low variability of this variable.

In support of previous research, HSGPA was found to be predictive of persistence for the nursing students in this study. During the recent shortage of nurses and the concurrent reduction in the quantity and quality of nursing school applicants, many schools of nursing lowered their admission requirements to maintain their enrollments (Allen, et al., 1988). The numbers of applicants to nursing programs has increased since 1988, allowing nursing schools to once again be more selective in their choice of applicants (Mullinix, 1990). College grades were also found to negatively impact persistence. Findings from this study corroborate those from previous studies -- students with lower high school or lower college grades are at risk for failure.

Employment and Persistence

Slightly more nursing students than other students had part-time jobs off campus, and this variable indirectly predicted persistence for them. Although part-time jobs off campus did not enter the equation, it is interesting to note that it had a

simple correlation with persistence of .07. At the sixth step, hours per week spent working during the last year of school entered the equation and the beta for part-time jobs off campus switched to -.02. This indicates that the beneficial aspect of working part-time off campus was eliminated when the time spent working was controlled. It appears that working off campus is beneficial as a result of the time spent working, not the off-campus location. There is an aspect of working more hours per week during the last year of school that is a powerful positive contributor to persistence for nursing students. Perhaps their income from work allowed them to stay in school. Or perhaps they were working in hospitals and were benefiting from professional socialization while at work.

In contrast to Astin's findings for the aggregate of college students, holding a part-time job on campus was found to negatively contribute to persistence for the nursing students. This relationship was strengthened when the number of hours worked per week entered the equation eliminating the positive effect of hours spent working left a greater negative effect for working part-time on campus. Holding a part-time job on campus had the second largest final beta, and hours worked per week had the third largest final beta.

Many nursing students work as nursing assistants during their last year of school. This experience expands their clinical expertise, encourages their professional socialization, and develops their knowledge of nursing care services. The relationships between employment and persistence found in this study might be explained as follows: holding a part-time job on campus contributed to withdrawal because these students did not work in hospitals and therefore did not receive professional socialization, increased clinical skills and encouragement to move up the ladder of nursing expertise. Additionally, those students who worked on campus

experienced interactions with non-nursing students and non-nursing jobs related to other careers to which they might have been drawn.

The Nursing Effect and Persistence

The largest contributor to persistence for the nursing students was the number of hours per week spent in classes and labs during the last year of school. This would seem no surprise, especially since the nursing students spent more time in classes and labs than did other students. However, it is surprising that this variable did not even enter the equation for the other two groups of students. Spending more time in classes and labs contributed to the persistence of the nursing students and did not contribute to the persistence of other students.

There was no direct measure of the nursing effect, which was, in essence, the camaraderie, the professional socialization, the group cohesiveness that developed among nursing students as a result of the intense experiences inherent in their education. The hours per week spent in classes and labs is the indirect measure of the nursing effect. Although hypothesis #7 was not supported in its entirety, the notion of there being a nursing effect, as measured indirectly by hours spent in classes and labs, is suggested by the data.

A Persistence Rate for Baccalaureate Nursing Students

A review of previous studies of attrition from baccalaureate nursing programs revealed the persistence rates to rang from 80% to 43% in single-university studies and 75% to 41% in national longitudinal studies. The attrition rate found in this study was 49%. The differences among these reported attrition rates are striking. One purpose of this study was to arrive at a current persistence rate based on national longitudinal data. Factors that might have influenced the reported rates of persistence will therefore be explored.

Findings from the single-university studies (including the approximate year of study) were: Emory University, 80% retention around 1970 (Hutcheson, 1979); University of Wisconsin, 43% retention around 1975 (Knopke, 1979); and three public and six private nursing programs in two midwestern states, 76% retention around 1988 (Benda (1991). Findings from the national longitudinal studies were: CIRP, 69% retention around 1974 (Astin, 1977); and NLS, 59% retention around 1976 (Munro (1980). The study by the NLN reported a 75% retention rate in 1986 (Rosenfeld, 1988), however this study was not longitudinal and therefore cannot be used a retention rate, per se.

The retention rates found by the two single-university and one nine-university studies vary from 43% to 80%. It is not surprising that Emory, being a highly selective university, had the highest retention rate. The study conducted at the university of Wisconsin-Madison, was undertaken "in part to assess the effectiveness of the new program after its implementation...". Perhaps the program was being revamped as a response to an unacceptably high attrition rate (43%). The selectivity and histories of the nine programs located in the two midwestern states are also unknown. The retention rates cited by these studies are less generalizable than are the national longitudinal studies.

Aside from the University of Wisconsin study, the two national longitudinal studies cite the lowest retention rates: 69% for the CIRP study conducted on the class of '69-'74; and 59% for the NLS study conducted on the class of '72-'76. The retention rate found in this study was 51%. The retention rates from the national longitudinal studies progressively decreased. As was mentioned in Chapter 2, crude calculations comparing enrollment and graduation data from NLN records showed a trend of decreasing retention. While the retention rate found in this study was

subject to some threats to internal and external validity, it may support an increase in the attrition rate for nursing students.

Contributions to Astin's Theoretical Model

One purpose of this study was to advance the research done in the area of Astin's theoretical model, which outlines the positive influence of involvement in the college experience on persistence in college. Activities thought to represent involvement in college and activities thought to detract from students' involvement in college were studied to observe their relationships with persistence.

For the group of students not in nursing and not in primary education, persistence was facilitated by living in student housing during the third year of school, spending more hours in student clubs and groups, and spending more time studying. Persistence was negatively influenced by being married at the time of graduation and working full time. There were also findings of a positive relationship between persistence and being married in 1985. Perhaps early marriage is an alternative source of support while attending school. Late marriage might be an escape from career to a more conventional lifestyle.

The findings from the group of other students partially supported Astin's theory. Findings from the group of primary education students were particularly interesting. The only involvement variable related to persistence for that group was part-time employment off campus. Only four of the involvement variables predicted persistence for the nursing students.

Persistence was defined as both working towards degree achievement and remaining in the original career/major. Astin's theory maintains that student involvement is a positive influence on persistence. This study, however, is not only looking at persistence but also at the original career choice. More of the

involvement variables might have been found to predict persistence if the theory had been used as Astin had intended -- without respect to career choice

Astin's theory warrants further study for the general population of students. However, more interesting findings might result from further studies of specific student groups and from examinations of how involvement in college relates to persistence for each group of students.

Recommendations for Academic Administration

Findings from this study indicate that students with lower HSGPAs and lower college grades are more likely to withdraw from their nursing programs. Although these students are academically at risk, those who are interested or acquainted with the health field through personal and employment experience remain an important resource. Schools of nursing cannot afford to lose this valuable human resource to attrition. However, nursing school faculties must not lower admission and progression standards to keep their enrollments up. Students who have unequivocally low HSGPAs and other factors highly predictive of academic difficulty should be carefully considered for admission. However, students who have marginal HSGPAs, mixed with other factors predictive of success, might be admitted more freely. If accepted, these students may require specialized interventions, such as lower faculty-student ratios, tutorial sessions, or other supportive programs. Many of these students will be successful and will add to the ranks of graduating nursing students.

During their second year of college, 72% of nursing students lived in student housing. During the third year of college, only 51% lived in student housing. Living in student housing during the third year of college contributed to the persistence of the nursing students as it did for the other students. Yet, by their third year in

college, most students do not wish to live in dormitories. Given the rigorous academic schedule and involvement in off-campus work by the nursing students, advisors should counsel students that living near other college students facilitates involvement in other activities which promote degree completion (and counteract the effects of the nursing students' engagement with the distancing activities). Nursing students should be encouraged to live near other college students, particularly other nursing students. Off-campus apartments or houses shared with other nursing students might be similarly beneficial alternatives to college dormitories.

The findings of this study related to the contribution of employment to persistence were not easily interpreted. A reasonable assumption from the findings is that employment in hospital settings promotes persistence toward the nursing degree. Student affairs personnel should work toward exploring this possibility further and facilitating relationships with hospitals and clinics located near campus to make health care-related part-time jobs or volunteer experiences available for their college students.

Recommendations for Further Research

SES was found not to predict persistence in a baccalaureate nursing program. Although the nursing students come from families with lower incomes and less educated parents, these factors did not contribute to their completing their degrees. This finding has been supported by previous research (Astin, 1977; Dunkelberger and Aadland, 1984; and Munro, 1977). The SES variables also were not predictive of degree completion for the larger group of other students. While one might suggest further research in this area, perhaps there is ample research and the recommendation should be for further research in the areas of the other variables

that have been found to be related to persistence, including those that might be related to SES.

Lower HSGPAs contribute negatively to persistence. It would be interesting to know the manner in which work sites and number of hours per week worked might benefit the more academically at-risk students. Perhaps these students would benefit from particular work situations even more than do those students who are not at-risk. Living in student housing might also be especially beneficial for these students.

Being married in 1989 was found to contribute negatively to the persistence of the other students. More of the nursing students were married than were the other students but being married was not found to be associated with persistence for the nursing students. This finding is contradictory and warrants further study in light of the fact that more of the nursing students are married by the time they graduate.

The findings related to employment and persistence towards the nursing degree were difficult to interpret. Further research might discover whether working off campus in a hospital or some other type of health care facility does directly promote persistence. Critical elements of the work experience might be identified, such as the type of work, number of hours worked, distance of work from home, and whether or not other students are co-workers.. This information would be useful in counseling students as to where to seek part-time work, and might have implications for their school-related clinical experiences.

The number of hours worked per week was positively related to persistence. It would be useful to know parameters within which working more hours hold benefits. The relationship between on-campus versus off-campus employment and the benefits of hours per week worked also need further study.

The nursing and primary education students were found to have much more traditional sex-role identities than did the other students. What is the relationship between sex-role identity and persistence? Is there colinearity between sex-role identity and prediction of changing career choice? Further research in this area may yield an understanding of the holding power of the nursing and primary education careers.

It was interesting to note that only two variables examined in this study were predictors for degree completion in primary education, and yet there was greatest persistence among this group of students. What factors do account for their persistence for a baccalaureate degree in primary education? Further research in this area is certainly warranted.

Many more of the students in the other group defected than did the nursing students -- 77% as compared with 49%. What is responsible for the holding power of the nursing career? The nursing students reported a lesser chance of changing careers. Are there other factors involved in their adherence to their choice of career in nursing? If these factors were identified, there might possibly be interventions that would strengthen the holding power or would spread it to the 49% of students who defect from nursing and might help to recruit those who would be more likely to persist.

At what time during the college years do nursing students drop out? It would be helpful to know if they are leaving during their first or second year when they take the bulk of their non-nursing classes and have not yet had the great amount of interaction with other nursing students. Is there greater retention during the first and second years at schools that begin their nursing courses in the first year?

The nursing effect was indirectly measured by the number of hours per week nursing students spent in classes and labs. One question that should be explored is,

how much of the increased persistence is due primarily to the increase in hours spent academically engaged, and how much is due to some other kind of bond that grows as a result of the experiences that are shared and that are unique to students of nursing? Are the hours spent in classes or the clinical hours of greater benefit? What kind of interactions are of most benefit? A greater understanding of this effect, and implementation of strategies to foster it, might also lead to a decrease in the 49% nursing school attrition rate found in this study.

The 51% persistence rate observed in this study is the lowest of the declining rates found by the national longitudinal studies. This finding is profoundly disturbing as forecasts would be for declining persistence among baccalaureate nursing students. This finding needs further research to either confirm decreasing persistence rates or yield more favorable projections.

Conclusion

As was discussed in Chapter 2, the attrition rates reported for baccalaureate nursing programs ranged from 20% to 57% in single-university studies and 25% to 41% in national longitudinal studies. The attrition rate for this study was based on national longitudinal data. The limitations to the internal validity of the study, which were discussed in Chapter 3, probably caused an artificial diminution of the attrition rate in this study, leaving a rate of 49%.

Although this rate is probably an underestimation of attrition, it points to the fact that each year many nursing students are lost to their programs. We are exiting the 20th century with a serious shortage of baccalaureate, master's, and doctorally prepared nurses.

With a health care delivery system that grows increasingly sophisticated and unwieldy, these students represent the human resources needed to deliver nursing

care services throughout the nation. It is vital that further research studies be done to increase our understanding of the issues related to helping nursing candidates persist and complete their educational programs. Furthermore, nursing educators should endeavor to increase the involvement of their students in the college experience and conduct further research to document the relationship between involvement and persistence for baccalaureate nursing students.

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Appendix A

Student Information Form
and
Follow-Up Survey

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Appendix B

Tables for Chapter 4

Table B-1. Establishing the Likeness of Students of Nursing and Primary Education in HSGPAs, SES and Sex-Role Identity, in Percent

	Nursing	Primary Educ.	All Others	Comparing Nursing & Primary Ed. χ^2	Comparing All Three χ^2
HSGPA					
A	31	33	45	.39	48.66*
B	63	61	51		
C	6	5	4		
(N)	(349)	(529)	(9794)		
Parent's Income					
Less than $24,999	33	28	22	4.39	58.97*
$25,000 - $49,999	47	46	42		
$50,000 - $99,999	17	21	27		
$100,000 or more	3	4	9		
	(312)	(463)	(8461)		
Father's Education					
Not HS Graduate	12	8	8	15.67*	91.88*
HS Graduate	53	46	37		
College Graduate	24	27	27		
Graduate Degree	10	18	28		
(N)	(351)	(528)	(9647)		
Mother's Education					
Not HS Graduate	8	4	6	14.21*	86.70*
HS Graduate	70	64	52		
College Graduate	19	25	29		
Graduate Degree	3	7	13		
(N)	(343)	(534)	(9716)		
Leadership Ability					
Lowest 10%	2	1	0	3.14	51.71*
Below Average	11	11	7		
Average	43	39	36		
Above Average	35	38	41		
Highest 10%	9	11	15		
(N)	(353)	(531)	(9757)		

Note: Throughout the tables, due to rounding error, there will be an occasional total of more or less than 100%.

* $p \leq .01$

Table B-1, continued. Establishing the Likeness of Students of Nursing and Primary Education in HSGPAs, SES and Sex-Role Identity, in Percent

	Nursing	Primary Educ.	All Others	Comparing Nursing & Primary Ed. χ^2	Comparing All Three χ^2
Social Self-Confidence					
Lowest 10%	1	1	1	2.56	26.83*
Below Average	13	14	11		
Average	47	49	43		
Above Average	33	30	35		
Highest 10%	5	6	10		
(N)	(352)	(534)	(9752)		
Very Good Chance of Marrying within 1 Year of Finishing School[a]	23	29	17	3.41	61.10*
(N)	(354)	(537)	(9855)		
Goal: Raising Family					
Not Important	3	1	7	17.10*	157.28*
Somewhat Important	12	8	22		
Very Important	45	42	38		
Essential	39	49	32		
(N)	(347)	(530)	(9426)		
Belief: Wives at Home					
Disagree Strongly	60	57	74	2.31	110.59*
Disagree Some	24	25	15		
Agree Some	12	14	7		
Agree Strongly	5	3	4		
(N)	(338)	(524)	(9424)		
Belief: Equal Pay					
Disagree Strongly	2	2	1	3.67	56.81*
Disagree some	1	1	1		
Agree Some	12	17	8		
Agree Strongly	85	81	90		
(N)	(346)	(528)	(9462)		

[a] Questionnaire item from the 1985 SIF

* $p \leq .01$

Table B-1, continued. Establishing the Likeness of Students of Nursing and Primary Education in HSGPAs, SES and Sex-Role Identity, in Percent

	Nursing	Primary Educ.	All Others	Comparing Nursing & Primary Ed. χ^2	Comparing All Three χ^2
Drive to Achieve					
Lowest 10%	0	0	0	4.39	79.88*
Below Average	1	2	2		
Average	32	37	24		
Above Average	53	48	50		
Highest 10%	14	14	24		
(N)	(352)	(533)	(9749)		

* $p \leq .01$

Table B-2. Profiles for Miscellaneous Variables, in Percent

	Nursing	Primary Educ.	Others	χ^2
White	91	96	88	30.56*
(N)	(354)	(537)	(9855)	
College GPA				
B+ to A	33	52	44	28.07*
C+ to B	61	45	51	
C or Less	5	3	4	
(N)	(349)	(533)	(9781)	

*p≤ .05
**p≤ .01

Table B-3. Profiles for Distancing Activities, in Percent

	Nursing	Primary Educ.	All Others	χ^2
P-T Job On-Campus	58	56	63	13.03**
(N)	(346)	(526)	(9691)	
P-T Job Off-Campus	73	62	63	13.46**
(N)	(348)	(526)	(9719)	
F-T Job	12	13	12	.64
(N)	(345)	(525)	(9644)	
Hrs./Wk. Working[a]				
Less than 5	30	40	34	12.32*
6-10	18	18	19	
11-15	18	14	16	
16 Plus	33	28	31	
(N)	(346)	(526)	(9587)	
Married in 1985[b]	1	2	0	52.07**
(N)	(352)	(537)	(9845)	
Married in 1989	13	16	9	39.48**
(N)	(350)	(531)	(9673)	
Student Housing Yr. 1	80	81	84	5.71
(N)	(337)	(515)	(9545)	
Student Housing Yr. 2	72	73	72	.14
(N)	(329)	(498)	(9387)	
Student Housing Yr. 3	51	53	53	.48
(N)	(322)	(501)	(9296)	
Student Housing Yr. 4	37	43	42	4.19
(N)	(319)	(494)	(9149)	

* $p \leq .05$

** $p \leq .01$

[a] During the last year of college.

[b] There were 9 women in the "other" group who were married in 1985 but they only constituted 0.2 percent of the group.

Table B-3, continued. Profiles for Distancing Activities, in Percent

	Nursing (N=354)	Primary Educ. (N=537)	All Others (N=9855)	χ^2
Hrs./Wk. spent Commuting to Campus[a]				
None	33	45	46	28.25**
<1 to 2 hrs.	36	33	32	
3 - 10 hrs.	26	19	20	
11+ hrs.	4	3	2	
(N)	(346)	(527)	(9573)	

[a] During the last year of college.

* p≤ .05

**p≤ .01

Table B-4. Profiles for Institutional Variables, in Percent

	Nursing	Primary Educ.	All Others	χ^2
Private	72	58	68	24.36**
Public	28	41	32	
(N)	(354)	(537)	(9855)	
University	23	14	34	109.88**
4-Year College	77	86	66	
(N)	(354)	(537)	(9855)	
Private University	12	5	17	176.93**
Private 4-Year	60	54	51	
Public University	12	9	17	
Public 4-Year	17	32	15	
(N)	(354)	(537)	(9855)	
Selectivity of the College[a]				
Low	17	27	16	254.70**
Medium	74	54	44	
High	8	19	40	
(N)	(354)	(537)	(9854)	

[a] Selectivity = SATV + SATM. Low = 0-924, Med = 925-1074, High = 1075-1600.

* $p \leq .05$

** $p \leq .01$

Table B-5. Profiles for Academic Activities, in Percent

	Nursing	Primary Educ.	All Others	χ^2
Since Entering College				
Worked on Professor's Research Project	20	11	21	31.51**
(N)	(347)	(524)	(9649)	
Since Entering College				
Assisted Faculty In Teaching Course	15	15	16	.66
(N)	(345)	(525)	(9650)	
Hours Per Week In Class/Labs[a]				
0 - 5	7	8	8	174.27**
6 - 15	26	39	48	
16 - 20	29	33	29	
20 or more	38	20	14	
(N)	(348)	(524)	(9598)	
Hours Per Week Studying/Homework[a]				
0 - 2	1	4	3	27.59**
3 - 10	46	48	42	
11 - 20	42	34	38	
20 or more	11	13	17	
(N)	(348)	(527)	(9605)	
Hours Per Week Talking with Faculty Outside of Class[a]				
2 or less	83	83	80	3.28
3 or more	17	17	20	
(N)	(348)	(526)	(9599)	

[a] During last year of college
* $p \leq .05$
** $p \leq .01$

Table B-6. Profiles for Social Activities, in Percent

	Nursing	Primary Educ.	All Others	χ^2
Participated In Campus Protest	8	10	25	109.93**
(N)	(346)	(522)	(9636)	
Elected to Student Office	23	29	25	6.97*
(N)	(346)	(523)	(9658)	
Hours Per Week Socializing With Friends[a]				
2 or less	8	9	6	18.16**
3 - 10	51	45	45	
11 or more	41	45	49	
(N)	(348)	(526)	(9580)	
Hours Per Week In Student Groups/Clubs[a]				
0	41	35	32	41.23**
Less than 1 to 2	38	40	36	
3 - 10	16	21	28	
11 or more	4	4	4	
(N)	(345)	(522)	(9578)	
Member of Sorority	25	25	26	1.14
(N)	(343)	(524)	(9673)	

[a] During last year of college

* $p \leq .05$

** $p \leq .01$

Appendix C

Tables for Chapter 5

Table C. The Relationship of Background Variables to Persistence, in Percent

	Nursing					Primary Education					All Other Students				
(N)[a]	Grad. (140)	Persist (37)	Defect (169)	(N)	χ^2	Grad. (262	Persist (49)	Defect (224)	(N)	χ^2	Grad. (1391)	Persist (397)	Defect (7503)	(N)	χ^2
HSGPA															
A	55	6	39	(107)	27.08*	51	10	39	(177)	6.58	24	3	73	(4369)	141.60*
B	36	14	49	(214)		48	10	42	(322)		16	4	79	(4920)	
C	5	5	90	(20)		32	4	64	(28)		6	5	89	(437)	
D	0	0	0	(0)		0	0	0	(0)		0	0	100	(5)	
White	42	11	47	(316)	4.54	50	9	41	(512)	5.04	19	4	77	(8651)	18.04*
Non-White	23	10	67	(30)		26	13	61	(23)		18	6	76	(1140)	
Parent's Income															
Less than $25,000	35	9	56	(100)	5.05	42	13	45	(131)	7.56	17	6	76	(1934)	53.44*
$25,000 - $49,999	43	11	46	(143)		53	8	39	(210)		19	4	77	(3630)	
$50,000 - $99,000	47	6	47	(51)		50	8	41	(99)		23	3	74	(2305)	
$100,000 or More	40	20	40	(10)		67	5	29	(21)		18	3	79	(763)	
Father's Education															
Not HS Graduate	29	17	55	(42)	7.22	48	9	43	(42)	.28	17	5	78	(773)	33.41*
HS Graduate	42	10	47	(179)		50	9	40	(242)		18	5	77	(3549)	
College Graduate	39	13	48	(85)		49	9	42	(145)		20	4	77	(2616)	
Graduate Degree	51	3	46	(37)		49	8	42	(97)		22	3	75	(2649)	
Mother's Education															
Not HS Graduate	33	12	54	(24)	3.69	35	9	56	(23)	6.78	14	5	81	(534)	37.82*
HS Graduate	41	12	47	(241)		50	8	42	(338)		19	5	76	(5057)	
College Graduate	41	7	52	(69)		50	10	41	(133)		20	3	77	(2799)	
Graduate Degree	54	0	45	(11)		45	18	37	(38)		21	3	76	(1262)	

a The sample sizes given in Tables C - G may vary slightly for each variable due to missing data.

* $p \leq .01$

Appendix D

Tables for Chapter 6

Table D. The Relationship of Involvement in Distancing Activities to Persistence, in Percent

	Nursing					Primary Education					All Other Students				
(N)	Grad. (140)	Persist (37)	Defect (169)	(N)	χ^2	Grad. (262)	Persist (49)	Defect (224)	(N)	χ^2	Grad. (1891)	Persist (397)	Defect (7503)	(N)	χ^2
Student Housing Yr. 1															
Yes	44	9	47	(265)	7.38*	50	9	41	(415)	1.41	20	3	77	(7942)	48.10**
No	29	18	52	(65)		46	12	42	(98)		18	7	75	(1542)	
Student Housing Yr. 2															
Yes	47	7	46	(232)	17.36**	51	9	40	(361)	.33	21	3	76	(6711)	86.65**
No	29	21	50	(91)		48	10	41	(135)		16	7	77	(2619)	
Student Housing Yr. 3															
Yes	51	8	41	(163)	11.55**	54	7	39	(266)	4.27	22	2	75	(4924)	101.25**
No	33	15	52	(155)		47	12	41	(233)		17	6	77	(4315)	
Student Housing Yr. 4															
Yes	51	6	43	(115)	6.95*	50	9	41	(215)	.66	23	2	75	(3832)	64.27**
No	38	13	48	(200)		52	10	37	(277)		18	5	76	(5265)	
Hrs./Wk. Commuting to Campus[a]															
None	49	4	46	(112)	13.32*	49	8	43	(238)	7.54	22	2	76	(4346)	96.81**
Less than 1 to 2 Hrs.	42	14	44	(123)		54	9	37	(172)		19	5	76	(3042)	
3 to 10 Hrs.	31	13	56	(90)		42	14	44	(100)		17	6	77	(1950)	
11 or More Hr	31	23	46	(13)		60	0	40	(15)		15	7	77	(175)	

a During last year of college

* $p \leq .05$

** $p \leq .01$

Table D, continued. The Relationship of Distancing Activities to Persistence, in Percent

	Nursing					Primary Education					All Other Students				
(N)	Grad. (140)	Persist (37)	Defect (169)	(N)	χ^2	Grad. (262)	Persist (49)	Defect (224)	(N)	χ^2	Grad. (1891)	Persist (397)	Defect (7503)	(N)	χ^2
P-T Job On Campus															
Yes	37	8	55	(196)	8.72**	50	8	42	(294)	1.48	20	3	77	(6078)	19.42**
No	45	15	40	(143)		48	11	41	(230)		19	5	76	(3551)	
P-T Job Off Campus															
Yes	41	13	47	(246)	3.00	44	11	45	(324)	10.62**	18	5	77	(6112)	33.58**
No	40	6	53	(94)		58	6	36	(200)		22	3	75	(3544)	
Full-Time Job															
Yes	13	13	73	(37)	12.59**	38	13	49	(69)	4.64	11	8	81	(1182)	88.68**
No	43	11	46	(301)		51	9	40	(454)		20	4	76	(8399)	
Hrs./Wk. Working[a]															
Less than 5	42	11	48	(103)	2.87	56	9	35	(212)	16.80**	21	4	75	(3267)	41.42**
6 - 10 Hrs.	47	6	47	(64)		57	4	39	(93)		22	3	75	(1848)	
11 - 15 Hrs.	38	13	49	(61)		35	11	54	(74)		19	3	77	(1493)	
16 or More Hrs.	38	13	49	(110)		43	12	45	(145)		17	6	77	(2919)	
Married in '85															
Yes	20	20	60	(5)	1.10	80	10	10	(10)	4.48	27	0	73	(22)	1.66
No	41	10	49	(339)		48	9	42	(525)		19	4	77	(9759)	
Married in '89															
Yes	35	7	58	(43)	2.11	52	8	40	(85)	.25	15	3	82	(836)	16.56**
No	42	11	47	(299)		49	9	41	(444)		20	4	76	(8774)	

a During last year of college

* $p \leq .05$

** $p \leq .01$

Appendix E

Tables for Chapter 7

Table E. The Relationship of Institutional Characteristics to Persistence, in Percent

	Nursing					Primary Education					All Other Students				
(N)	Grad. (140)	Persist (37)	Defect (169)	(N)	χ^2	Grad. (262)	Persist (49)	Defect (224)	(N)	χ^2	Grad. (1891)	Persist (397)	Defect (7503)	(N)	χ^2
Public	45	14	41	(87)	1.48	63	12	25	(205)	19.51**	19	6	74	(2545)	66.51**
Private	48	9	43	(209)		48	7	45	(279)		23	3	74	(5965)	
4-Year College	44	10	46	(222)	5.04	54	9	37	(416)	.29	22	3	74	(5603)	9.18**
University	57	12	31	(74)		56	10	34	(68)		22	5	73	(2907)	
Institution type & control															
Private University	71	8	21	(38)	12.33*	45	4	50	(22)	20.10**	26	3	71	(1562)	78.32**
Private 4-Year College	43	9	47	(171)		48	8	44	(257)		23	3	74	(4403)	
Public University	42	17	42	(36)		61	13	26	(46)		18	7	75	(1345)	
Public 4-Year College	47	12	41	(51)		63	11	25	(159)		21	6	74	(1200)	
Selectivity of Institution[a]															
Low	31	14	55	(42)	7.80	52	16	32	(131)	11.05*	21	5	73	(1209)	29.32**
Med.	48	11	41	(225)		56	6	37	(260)		22	5	74	(3694)	
High	62	3	34	(29)		50	9	41	(93)		23	3	74	(3606)	

[a] Selectivity of institution = SATV + SATM. Low = 1 - 924, med. = 925 - 1074, hi = 1075 - 1600 (average all students).

* $p \leq .05$

** $p \leq .01$

Appendix F

Tables for Chapter 8

Table F. The Relationship of Involvement in Academic Activities to Persistence, in Percent

	Nursing					Primary Education					All Other Students				
(N)	Grad. (140)	Persist (37)	Defect (169)	(N)	χ^2	Grad. (262)	Persist (49)	Defect (224)	(N)	χ^2	Grad. (1891)	Persist (397)	Defect (7503)	(N)	χ^2
Hrs/Wk in Classes/Lab[a]															
5 or less	8	12	79	(24)	65.39**	46	10	44	(41)	17.34**	15	5	79	(810)	14.06*
6 to 15 Hrs.	20	10	69	(88)		41	12	47	(205)		20	4	76	(4558)	
16 to 20 Hrs.	34	12	53	(99)		50	8	42	(171)		20	4	76	(2790)	
21 or more	66	10	24	(129)		66	7	28	(105)		21	4	75	(1379)	
Hrs/Wk Studying[a]															
2 or less	0	0	100	(4)	6.66	52	0	48	(23)	11.98	15	5	80	(290)	33.51**
3 to 10 Hrs.	40	11	49	(156)		47	13	40	(251)		18	4	78	(4001)	
11 - 20 Hrs.	43	13	44	(142)		54	8	39	(181)		21	4	75	(3589)	
21 or more	42	5	53	(38)		47	3	50	(70)		23	5	72	(1664)	
Hrs/Wk Talking with Faculty[a]															
2 or less	40	11	49	(284)	.41	49	10	41	(433)	4.54	19	4	76	(7657)	14.20**
3 or more	45	11	45	(56)		55	3	42	(91)		22	3	75	(1881)	
Worked on Professor Research Project															
Yes	55	4	41	(69)	9.29**	49	3	47	(57)	2.81	21	3	75	(2020)	7.69*
No	36	12	51	(271)		49	10	41	(465)		19	4	77	(7567)	
Assisted Faculty Teaching Class															
Yes	56	4	40	(50)	7.14*	50	7	42	(80)	.32	22	3	75	(1557)	10.18**
No	37	12	50	(288)		49	9	41	(443)		19	4	77	(8031)	

a During the last year in college

* $p \leq .05$

** $p \leq .01$

Table F, continued. The Relationship of Involvement in Social Activities to Persistence, in Percent

	Nursing					Primary Education					All Other Students				
(N)	Grad. (140)[a]	Persist (37)	Defect (169)	(N)	χ^2	Grad. (262)	Persist (49)	Defect (224)	(N)	χ^2	Grad. (1891)	Persist (397)	Defect (7503)	(N)	χ^2
2 or Less Hrs.	25	14	61	(28)	7.88	50	8	42	(48)	4.34	12	7	81	(571)	57.33**
3 - 10 Hrs.	40	14	46	(171)		47	12	42	(238)		19	5	76	(4277)	
11 or More Hrs.	45	6	49	(141)		53	7	40	(238)		21	3	76	(4671)	
Hrs./wk. in Student Groups/Clubs[a]															
None	35	12	53	(137)	15.44*	49	11	40	(181)	5.0	14	6	80	(2999)	143.5**
Less than 1 to 2 Hrs.	45	14	41	(130)		52	6	42	(209)		21	3	75	(3384)	
3 - 10 Hrs.	51	5	44	(57)		50	10	40	(110)		23	3	74	(2702)	
11 or More Hrs.	15	0	85	(13)		35	10	55	(20)		23	2	74	(434)	
Elected to Student Office															
Yes	49	9	42	(78)	2.72	47	10	43	(154)	.58	23	3	74	(2362)	26.50**
No	38	11	50	(261)		50	9	41	(367)		18	4	77	(7234)	
Participated in Protests /Demons.															
Yes	34	10	55	(29)	.56	33	12	55	(51)	6.0*	19	3	77	(2403)	4.42
No	41	11	48	(310)		51	9	40	(469)		19	4	76	(7171)	
Member of Sorority															
Yes	37	11	52	(83)	.34	51	13	36	(130)	3.95	20	4	76	(2545)	4.16
No	41	11	48	(253)		49	8	43	(392)		19	4	77	(7066)	

a During the last year in college.

* $p \leq .05$

** $p \leq .01$

Appendix G

Tables for Chapter 9

Table G-1. Predicting Persistence Towards
Bachelor's Degree in Nursing

Step	Variable Name	R	r	Beta after step 1	2	3	4	5	6	7
Background characteristics:										
Block 1										
1	HSGPA	26	26	26	27	27	21	15	14	12
Distancing Activities:										
Block 2										
2	Part-time job on campus	32	-16	-18	-18	-20	-17	-17	-19	-19
3	Student housing yr-3	35	14	13	15	15	12	11	13	12
Activities: Block 4										
4	Hrs/wk in class/labs	45	36	32	30	29	29	28	31	31
College GPA: Block 5										
5	College GPA	47	25	16	15	14	13	13	14	14
Forward: Block 6										
6	Hrs/wk spent working	49	06	06	09	11	16	16	16	17
7	Selectivity	51	16	13	13	12	11	11	12	12
Variables not in the equation										
	White		03	05	06	07	05	05	05	01
	Parents' income		06	09	05	04	04	05	06	03
	Student housing yr-1		06	07	13	08	07	08	07	04
	Student housing yr-2		05	03	10	02	04	04	04	02
	Student housing yr-4		09	08	10	00	-02	-02	01	-00
	Hrs/wk commuting		-09	-07	-09	-04	-04	-05	-07	-06
	Part-time job off campus		07	05	03	06	04	04	-02	-02
	Full-time job		-18	-14	-14	-12	-06	-06	-09	-09
	University		11	09	09	11	08	09	09	04
	Worked on professor's research		11	10	11	11	09	08	06	05
	Assisted teaching class		07	04	04	02	02	02	01	02

Note: Beta coefficients of 00 and -00 are rounded from ≤0.005 and ≤-0.005.
Decimals omitted from beta coefficients.

Table G-2. Standard Deviations and Interc
Among Variables For Nursing Stude

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1
1 White	1.93	.25															
2 Parents' income	6.97	2.92	-00														
3 Father's education	4.55	1.94	13	52													
4 Mother's education	4.15	1.51	06	39	51												
5 **HSGPA**	**5.98**	**1.41**	11	-10	01	06											
6 **Part-time job on campus**	**1.61**	**.49**	06	-20	02	-02	06										
7 Part-time job off campus	1.73	.45	06	-04	-07	-02	07	-09									
8 Full-time job	1.10	.30	-14	-03	-04	-01	-17	01	08								
9 **Hrs/wk working**	**5.15**	**2.35**	-01	-07	01	-03	00	14	31	24							
10 Hrs/wk commuting	2.64	1.62	-02	-13	-22	-13	-09	-12	24	05	13						
11 Student housing yr-1	1.84	.36	16	17	19	15	-03	25	-09	03	05	-29					
12 Student housing yr-2	1.76	.43	08	07	12	02	07	31	-11	-20	-00	-39	67				
13 **Student housing yr-3**	**1.53**	**.50**	-02	08	15	07	06	13	-15	-16	-11	-39	35	54			
14 Student housing yr-4	1.38	.49	07	-02	10	10	04	09	-23	-09	-17	-48	25	38	62		
15 Married in 1985	1.01	.11	02	-19	-11	-13	-18	01	-18	-04	-12	07	-26	-20	-12	-09	
16 Married in 1989	1.13	.33	05	-18	-14	-20	-04	05	04	-08	02	16	-04	-07	-11	-20	29
17 Private	1.72	.45	-02	00	04	08	-16	05	04	-01	-02	00	07	05	24	16	07
18 Public	1.28	.45	02	00	-04	-08	16	-05	-04	01	02	00	-07	-05	-24	-16	-07
19 University	1.23	.42	-05	23	17	19	10	-02	19	01	04	05	05	-05	-12	-11	-06
20 Four-year college	1.77	.42	05	-23	-17	-19	-10	02	-19	-01	-04	-05	-05	05	12	11	06
21 **Selectivity**	**988.75**	**83.68**	37	21	16	18	14	02	-04	-07	-08	-08	21	13	11	12	-21
22 Member of a sorority	1.25	.43	00	22	16	17	03	-02	-02	-00	-08	-15	10	08	02	03	-06
23 Participated in demonstrations	1.07	.26	-05	02	06	09	-07	06	-07	01	-00	-12	04	12	11	10	-03
24 Elected to a student office	1.26	.44	00	-01	07	14	09	15	01	02	11	-12	05	18	19	11	-07
25 Worked on professor's research	1.21	.41	05	00	20	05	06	10	09	03	10	-06	14	10	08	07	-06
26 Assisted teaching class	1.16	.36	-11	08	09	14	14	00	-01	12	04	-12	07	-01	19	16	-05
27 **Hrs/wk in classes/labs**	**6.82**	**1.27**	07	00	05	06	18	-09	07	-23	-16	-02	02	-01	10	11	02
28 Hrs/wk studying	5.77	1.24	10	-02	-03	00	09	-11	-04	-14	-21	03	-06	-04	08	14	11
29 Hrs/wk socializing	5.54	1.57	12	15	24	12	-11	08	-13	-06	-05	-29	21	25	22	33	-13
30 Hrs/wk talking with faculty	2.75	.98	-08	-04	09	11	01	09	-14	-08	-02	03	03	07	14	21	-08
31 Hrs/wk in student clubs	2.52	1.56	-03	10	21	15	08	10	-18	01	-07	-31	05	18	25	34	-11
32 **College GPA**	**4.10**	**.93**	08	-12	-02	-00	50	02	03	-15	-04	-04	-01	07	08	04	-09
33 Persisted in career and degree	1.99	.95	08	06	04	-00	26	-17	07	-18	06	-09	06	05	14	09	-11

Note: Decimals omitted from correlations. 00 and -00 are rounded from ≤0.005 and ≤-0.0052.

2. Standard Deviations and Intercorrelations
mong Variables For Nursing Students

7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
8																									
1	24																								
4	05	13																							
9	03	05	-29																						
1	-20	-00	-39	67																					
5	-16	-11	-39	35	54																				
3	-09	-17	-48	25	38	62																			
8	-04	-12	07	-26	-20	-12	-09																		
4	-08	02	16	-04	-07	-11	-20	29																	
4	-01	-02	00	07	05	24	16	07	-06																
4	01	02	00	-07	-05	-24	-16	-07	06	100															
9	01	04	05	05	-05	-12	-11	-06	-09	-23	23														
9	-01	-04	-05	-05	05	12	11	06	09	23	-23	100													
4	-07	-08	-08	21	13	11	12	-21	-16	-02	02	37	-37												
2	-00	-08	-15	10	08	02	03	-06	-05	-09	09	13	-13	04											
7	01	-00	-12	04	12	11	10	-03	-11	14	-14	-08	08	01	09										
1	02	11	-12	05	18	19	11	-07	-14	19	-19	-02	02	04	06	22									
9	03	10	-06	14	10	08	07	-06	-04	-01	01	00	00	11	00	-03	06								
1	12	04	-12	07	-01	19	16	-05	-06	07	-08	00	00	-03	-05	-04	15	27							
7	-23	-16	-02	02	-01	10	11	02	-09	-03	03	09	-09	06	05	05	06	07	04						
4	-14	-21	03	-06	-04	08	14	11	-11	13	-14	-15	15	03	-01	00	-02	13	11	25					
3	-06	-05	-29	21	25	22	33	-13	-31	00	00	16	-16	25	17	13	12	04	11	-01	00				
4	-08	-02	03	03	07	14	21	-08	-15	13	-13	-12	12	01	00	07	08	08	12	03	21	35			
8	01	-07	-31	05	18	25	34	-11	-23	08	-01	-07	07	03	29	23	39	08	13	04	14	27	27		
3	-15	-04	-04	-01	07	08	04	-09	01	07	-07	-02	02	07	00	-06	07	10	04	13	16	-08	09	02	
7	-18	06	-09	06	05	14	09	-11	-05	-02	02	12	-12	17	-03	-08	03	11	08	36	04	00	01	-05	25

052.

Table G-3. Predicting Persistence Towards Bachelor's Degree in Other Than Nursing and Other Than Primary Education

Step	Variable Name	R	r	Beta after step 1	2	3	4	5	6	7	8	9	10	11	12
Background characteristics:															
Block 1															
1	HSGPA	11	11	11	10	10	11	10	11	11	11	10	10	10	08
Distancing Activities:															
Block 2															
2	Full-time job	12	-05	-04	-04	-04	-04	-04	-04	-04	-04	-04	-04	-04	-03
3	Married in 1989	12	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03
4	Student housing yr-1	12	-01	-02	-03	-03	-03	-04	-03	-03	-03	-03	-03	-03	-03
5	Student housing yr-3	13	03	02	02	01	03	03	03	03	03	02	02	02	02
6	Part-time job on campus	13	-01	-02	-02	-02	-02	-02	-02	-02	-03	-03	-03	-03	-03
7	Married in 1985	13	02	02	02	02	02	02	02	02	02	02	02	02	02
Characteristics of the Institution: Block 3															
8	Private	13	03	03	03	02	03	02	03	03	03	03	03	03	02
Activities: Block 4															
9	Hrs/wk in clubs	14	05	04	04	03	04	03	04	04	04	04	04	04	04
10	Participated in demonstrations	14	-02	-02	-02	-02	-02	-02	-02	-02	-02	-03	-03	-03	-03
11	Hrs/wk studying	14	05	03	03	03	03	03	03	03	03	02	02	02	02
College GPA: Block 5															
12	College GPA	15	09	05	05	05	05	05	05	05	05	05	05	05	05
Variables not in the equation															
White			-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-02
Student housing yr-4			03	02	01	01	02	01	01	01	01	00	00	00	00
Selectivity			03	00	-00	-01	-00	-01	-00	-00	-01	-01	-00	-01	-00
Elected to student office			03	02	02	02	02	02	02	02	02	01	01	01	01

Note: Beta coefficients of 00 and -00 are rounded from ≤0.005 and ≥-0.005.
Decimals omitted.

Table G-3. Predicting Persistence Towards Bachelor's Degree in Other Than Nursing and Other Than Primary Education

			Beta after step											
	R	r	1	2	3	4	5	6	7	8	9	10	11	12
ics:														
	11	11	11	10	10	11	10	11	11	11	10	10	10	08
	12	-05	-04	-04	-04	-04	-04	-04	-04	-04	-04	-04	-04	-03
	12	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03	-03
r-1	12	-01	-02	-03	-03	-03	-04	-03	-03	-03	-03	-03	-03	-03
r-3	13	03	02	02	01	03	03	03	03	03	02	02	02	02
ampus	13	-01	-02	-02	-02	-02	-02	-02	-02	-03	-03	-03	-03	-03
	13	02	02	02	02	02	02	02	02	02	02	02	02	02
	13	03	03	03	02	03	02	03	03	03	03	03	03	02
	14	05	04	04	03	04	03	04	04	04	04	04	04	04
monstrations	14	-02	-02	-02	-02	-02	-02	-02	-02	-02	-03	-03	-03	-03
	14	05	03	03	03	03	03	03	03	03	02	02	02	02
	15	09	05	05	05	05	05	05	05	05	05	05	05	05
ation														
		-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-01	-02
		03	02	01	01	02	01	01	01	01	00	00	00	00
		03	00	-00	-01	-00	-01	-00	-00	-01	-01	-00	-01	-00
e		03	02	02	02	02	02	02	02	02	01	01	01	01

of 00 and -00 are rounded from ≤0.005 and ≥-0.005.

Table G-4. Means, Standard Deviations and
Simple Correlations of Variables
For Other Students

Variables	M	SD	r	final beta
White	1.89	.30	-0.01	-0.02
Parents' income	8.19	3.16	.01	.00
Father's education	5.46	2.10	.02	.00
Mother's education	4.93	1.84	.01	-0.00
HSGPA	**6.33**	**1.38**	**.11**	**.08**
Student housing yr-1	**1.84**	**.36**	**-0.01**	**-0.03**
Student housing yr-2	1.73	.44	.01	-0.00
Student housing yr-3	**1.54**	**.50**	**.03**	**.02**
Student housing yr-4	1.42	.49	.03	.00
Hrs/wk commuting	2.21	1.43	-0.02	-0.00
Part-time job on campus	**1.64**	**.50**	**-0.01**	**-0.03**
Part-time job off campus	1.63	.48	-0.03	-0.01
Full-time job	**1.12**	**.32**	**-0.05**	**-0.03**
Hrs/wk working	4.88	2.47	-0.02	.00
Married in 1985	**1.00**	**.03**	**.02**	**.02**
Married in 1989	**1.07**	**.27**	**-0.03**	**-0.03**
Private	**1.69**	**.46**	**.03**	**.02**
Public	1.31	.46	-0.03	1.00
University	1.35	.48	.00	.00
Four-year college	1.65	.49	-0.00	-0.00
Selectivity	1056.74	129.07	.03	-0.00
Hrs/wk in classes/labs	6.26	1.23	.01	.00
Hrs/wk studying	**5.90**	**1.40**	**.05**	**.02**
Hrs/wk talking with faculty	2.79	.98	.02	.00
Worked on professor's research	1.21	.41	.01	.00
Assisted teaching class	1.16	.37	.01	.00
Hrs/wk socializing	5.67	1.51	.01	--0.00
Hrs/wk in student clubs	**2.81**	**1.57**	**.05**	**.04**
Elected to a student office	1.25	.43	.03	.01
Participated in demonstrations	**1.25**	**.43**	**-0.02**	**-0.03**
Member of a sorority	1.26	.44	.01	-0.00
College GPA	**4.37**	**.96**	**.09**	**.05**
Persisted in career and degree	1.46	.82		

Note: 00 and -00 are rounded from ≤0.005 and ≤-0.005. Variables in the equation are in bold.

Table G-5. Predicting Persistence Towards
Bachelor's Degree in Primary Education

Step	Variable Name	R	r	Beta after step 1	Beta after step 2
	Distancing Activities: Block 2				
1	Part-time job off campus	17	-17	-17	-18
	Characteristics of the Institution: Block 4				
2	Private	27	-20	-21	-20
	Variables not in the equation				
	Hrs/wk working		-11	-06	-03
	Participated in demonstrations		-12	-11	-09

Note: Beta coefficients of 00 or -00 are rounded from > /0.005 and > /-0.005.
Decimals omitted.

Table G-6. Means, Standard Deviations and
Simple Correlations of Variables
For Students of Primary Education

Variables	M	SD	r	final beta
White	1.95	.20	.06	.05
Parents' income	7.54	2.94	.04	.04
Father's education	5.00	2.05	.01	.02
Mother's education	4.61	1.64	-0.00	-0.00
HSGPA	6.02	1.36	-0.01	.00
Student housing yr-1	1.83	.38	-0.03	-0.09
Student housing yr-2	1.74	.44	-0.01	-0.08
Student housing yr-3	1.55	.50	.00	-0.00
Student housing yr-4	1.43	.49	-0.02	-0.01
Hrs/wk commuting	2.26	1.51	.00	.04
Part-time job on campus	1.56	.50	.01	.01
Part-time job off campus	**1.60**	**.49**	**-0.17**	**-0.18**
Full-time job	1.11	.32	-0.04	-0.01
Hrs/wk working	4.69	2.54	-0.11	-0.03
Married in 1985	1.01	.11	.08	.07
Married in 1989	1.15	.35	.01	.03
Private	**1.59**	**.49**	**-0.20**	**-0.21**
Public	41.00	.49	.20	1.00
University	1.14	.35	.05	.01
Four-year college	1.86	.35	-0.05	-0.01
Selectivity	982.26	97.25	-0.04	-0.04
Hrs/wk in classes or labs	6.46	1.27	.04	.03
Hrs/wk studying	5.67	1.42	-0.03	-0.05
Hrs/wk talking with faculty	2.73	.98	-0.01	.00
Worked on professor's research	1.11	.32	-0.06	-0.04
Assisted teaching class	1.15	.36	-0.01	.01
Hrs/wk socializing	5.57	1.52	-0.03	-0.02
Hrs/wk in student clubs	2.61	1.48	-0.05	-0.06
Elected to a student office	1.29	.48	-0.09	-0.07
Participated in demonstrations	1.09	.29	-0.12	-0.09
Member of a sorority	1.26	.44	.08	.07
College GPA	4.54	.96	.03	.06
Persisted in career and degree	2.17	.94		

Note: 00 and -00 are rounded from ≤ 0.005 and .-0.005. Variables in the equation are in bold.