INDICATORS OF PERSISTENCE AND SUCCESS OF COMMUNITY COLLEGE
TRANSFER STUDENTS ATTENDING
A SENIOR COLLEGE

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Mark E. Underwood, B.A., M.A.
Denton, Texas
December, 1998

The purpose of the study was to determine whether age, ethnicity, gender, full-time/part-time status, and the community college academic variables of cumulative GPA, total transferrable hours, and number of completed core courses predicted students' persistence or GPA at a four-year university.

The sample consisted of 114 students who transferred to the University of North Texas in Fall 1990 with a minimum of 12 transferrable hours from a public community college; students with credits from a private school, proprietary school, or four-year school were excluded. The UNT Registrar's Office authorized a random sampling and provided all data.

Stepwise multiple regression analysis was employed to determine the predictive significance of the seven independent variables on each of the two dependent variables. No predictor variable was chosen as significant in predicting persistence, defined as completing at least one course per long semester with a "C" through Spring 1995. Community college GPA was found to be significant in predicting university GPA and provided the only basis for rejection of a null hypothesis. Recommendations for further study were for the use of complex statistical methods upon longitudinal data and numerous variables. It was also recommended that community college transfer students
continue to be studied as a group rather than in comparison to native university students.

Recommendations for administrative practice included the development of transfer agreements between two-year and four-year institutions to foster transfer success. In addition, a common course numbering system, such as that used in Texas, was recommended as a means to minimize transcript evaluation difficulties.
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ACKNOWLEDGMENTS

I wish to thank the members of my doctoral committee: Major Professor Dr. John Baier, Higher Education; Minor Professor Dr. Brenda Sims, English; Dr. Joe Stewart, recently retired as Vice-President for Student Affairs at UNT. Their attention and counsel have been forthright, timely, and always beneficial. They have treated me with unfailing professionalism and good will. Special regard goes to Dr. Baier for becoming my committee chair in a time of transition. To the Higher Education Faculty I extend thanks and admiration for their desire and capacity to build collegial relationships with their students. In addition to taskmasters and professors, the faculty serve as mentors and, when appropriate, regard their students basically as peers.

My special thanks to Dr. Howard W. Smith, Jr., from whom I took my first course in the Higher Education Program, who chaired my committee until his retirement, and who guided my dissertation proposal. Joneel Harris, UNT Registrar, clarified numerous questions for me and made available the raw data for the study; my thanks and best wishes for her.

To my wife, Diane, and our children, Jeanette, Jeremy, and Aaron, I offer my gratitude for their patience and good humor during the several years of this effort. They too appreciate education and hard work.

First and last, my praise and thanks to God for challenges, gifts and graces, and blessings in whatever form.
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CHAPTER I

INTRODUCTION

Transfer education serves as the very foundation of the American public two-year college. The two-year college began as an intermediary between high school and the university, providing compensatory education as well as pre-baccalaureate courses for transfer. As the demand and need for wider access to higher education grew in the United States, the number of two-year schools increased rapidly, as did their purposes (Deegan & Tillery, 1988; Cohen and Brawer, 1996; Dougherty, 1994; Phelan, 1997). Today the comprehensive community college provides a wide array of educational and community services. For example, Texas public community colleges are governed by a statutory mission/purpose statement listing nine functions, which are:

1) to provide technical programs up to two years in length leading to Associate degrees or certificates;

2) to provide vocational programs leading directly to employment in semi-skilled occupations;

3) to provide freshman and sophomore courses in arts and sciences;

4) to provide continuing adult education programs for occupational or cultural upgrading;
5) to provide compensatory education programs designed to fulfill the commitment of an admissions policy allowing the enrollment of disadvantaged students;

6) to provide a continuing program of counseling and guidance designed to assist students in achieving their individual educational goals;

7) to provide work force development programs designed to meet local and statewide needs;

8) to provide adult literacy and other basic skills programs for adults; and

9) such other purposes as may be prescribed by the Texas Higher Education Coordinating Board, for post-secondary education in Texas. (Texas Education Code, 1991).

As community colleges position themselves for the 21st century, the relevance of the transfer function has come into question (Wright, 1985; Deegan & Tillery, 1988; McGrath & Spear, 1991; Dougherty, 1994). Pincus and Archer declared that the transfer function is "in crisis" (1989, p. 1). And Pascarella and Terenzini (1991) suggested that local, state, and federal entities should cooperate to improve the "apparently moribund transfer function of the two-year college" (p. 643). Eaton, on the other hand, celebrated the success of this "collegiate" quality of two-year colleges and called upon them to strengthen it (1994, pp. 8-10). Debate over the need for and quality of the transfer function is occurring when many four-year colleges and universities have become increasingly reliant on students from community colleges to bolster enrollments (Townsend, McNerny, & Arnold, 1993; Cohen, 1994; Cejda, 1997).
How well community and junior colleges prepare their students for transfer is, therefore, an important issue, even more so as higher education faces increasing public and political scrutiny and the demand for proof of academic quality (Palmer, 1988; Cohen, 1991; Dougherty, 1991, 1992, 1994; Palmer & Eaton, 1991; Ewell, 1994; Gallego, 1997). Two-year colleges must develop and produce measures of the quality of transfer education and append those to the provision of access for persons who might not otherwise experience higher education. By the same token, simply to calculate the number of students who transfer from two-year to four-year institutions is only the beginning of qualitative assessment. From the perspective of two-year college students, administrators, faculty, supporters, and critics, more important are the questions of whether and how well transfer students succeed at the receiving college and what the two-year college experience contributes to that success. These questions and their answers are worthy of close inspection.

Statement of the Problem

The problem of this study concerned the relationship between the age, ethnicity, gender, full-time/part-time status, and selected academic achievements of community college transfer students and their success at a four-year college.

Purposes of the Study

The purpose of the study was to determine, using the stepwise multiple linear regression statistical technique, whether age, ethnicity, gender, full-time/part-time status, and selected community college academic achievements had predictive value for transfer
students' likelihood of persisting at a four-year college or predicted the students' GPA at the university.

Research Questions

The investigation sought to answer the fundamental questions of whether age, ethnicity, gender, full-/part-time status, and selected community college academic achievements predicted success at a four-year university. Success was defined as persistent enrollment in a four-year college until graduation or withdrawal. The quality of that persistence, measured by cumulative GPA at the university, was also investigated.

Seven specific research questions were addressed:

1. Does the student's cumulative transfer GPA predict success at the senior institution?
2. Does the total number of college-level credit hours earned at the two-year college predict success at the senior institution?
3. Does successful completion of one or more "core courses" at the community college predict success at the senior institution?
4. Does the transfer student's age predict success at the senior institution?
5. Does the transfer student's ethnicity predict success at the senior institution?
6. Does the transfer student's gender predict success at the senior institution?
7. Does the transfer student's full-time/part-time status while at the two-year college predict success at the senior institution?
Significance of the Study

Much extant research has calculated the percentage of students transferring from community colleges to senior institutions and provided demographic information about those students. The National Center for Educational Statistics (1996) reported that 45% of all freshmen in United States institutions of higher education are enrolled in public two-year colleges. According to Keener (1994), 80% of freshmen indicate they plan to transfer to a four-year institution to complete the bachelor’s degree. Clearly, community and junior colleges play an important role in providing initial access to higher education and in preparing students for transfer, although not all observers of the two-year college view its function as a democratizing social agent (Brint & Karabel, 1989). The quality of transfer preparation and the success of students at the four-year institution should be of concern to officials of both two- and four-year colleges and to anyone appreciating the power and value of education.

Researchers have also investigated the variables associated with students’ choosing to transfer, which range from their career aspirations and schools’ advising programs, to external factors such as local economic vitality. Comparisons of transfer and native students’ relative success at the four-year institution have yielded predictably conflicting results. Studies have also shown the various motivations students have for leaving the four-year college. The present investigation is significant because it focuses on students who have already achieved transfer to a four-year university and on experiences at the two-year school contributing to the success of that transfer. Additionally, the study has merit because it:
1. Investigates predictive factors which community college advisors, faculty, and administrators can utilize in advising students and in developing curricula and degree plans.

2. Provides four-year school officials with additional measures to assist in the selection process of community college transfer applicants.

3. Provides rationale for components of articulation agreements between two- and four-year colleges.

4. Contributes to the ongoing debate among educators, policy-makers, and the public over maintaining the transfer function of two-year institutions.

5. Contributes to the long-range success of transfer students at senior institutions and in the workplace.

As community colleges seek to improve all services to students, and concurrently to improve their image both with the public and legislatures, examination of factors affecting transfer student success at four-year institutions is significant. Study of the transfer function is an important component of overall institutional effectiveness.

Definition of Terms

COLLEGE-LEVEL CREDIT HOURS - Credit hours earned at either a two-year college or the four-year institution that are non-remedial/non-developmental and, therefore, are eligible for degree credit. This term is synonymous with "transferable credit hours."

CORE CURRICULUM - A collection of courses typically required for the Associate Degree or Bachelors Degree. For this study, the Core was defined as Freshman English I,
a transferrable Mathematics course, a laboratory science course, American History I or II, Introductory Computer Science, and Speech.

DEVELOPMENTAL/REMEDIAL COURSES - Courses defined by the Texas Higher Education Coordinating Board as “pre-collegiate” or “preparatory” to college-level credit courses. Such courses cannot be counted toward degree requirements at either the two-year college or four-year college.

FULL-TIME STUDENT - A student who completes a given long semester with at least twelve credit hours, inclusive of “institutional credit,” such as developmental courses.

PART-TIME STUDENT - A student who completes a given semester with less than twelve hours, inclusive of “institutional credit,” such as developmental courses.

PERSISTENCE - student behavior at the senior institution characterized by completion of at least one course per fall or spring term subsequent to transfer from a two-year college.

TRANSFER STUDENT - A student who enrolls in a four-year college after accumulating a minimum of twelve (12) transferrable hours at a two-year college.

TRANSFERRABLE CUMULATIVE GRADE POINT AVERAGE (GPA) - A student’s cumulative grade point average exclusive of grade points earned in developmental (remedial) courses.

Limitations

One limitation is that this study considered only the transcripts of students transferring to a single Texas university. While random sampling and the number of sending community colleges mitigate this limitation, the results may not be generalizable to all two-year college transfer students. Another limitation is that this study may not have
considered all characteristics of a student's two-year college experience which affect a transfer student's success at a four-year college or university.
Chapter two is an examination of literature related to the academic success of community/junior college students who transfer to a four-year institution. This chapter is presented in subsections entitled: Theories and Models Related to Transfer and Persistence; The Transfer Rate; and Factors Influencing Transfer and Persistence.

Theories and Models Related to Transfer and Persistence

Since the late 1960s and early 1970s, a number of formal theories as well as a number of models, theoretical frameworks less well-developed than formal theories, have been developed. Pascarella and Terenzini (1991), recognizing that debates over the definition of “theory” and “model” exist, suggest that more than twenty theories can be acknowledged. Some are frameworks for the explanation of human behavior in general that have been applied by researchers to college students. Others have been developed specifically to explain student behavior, development, and change provoked by the college experience. This section will examine only such theories and models.

Astin’s Theory of Involvement

Grounded in the expenditure of psychological energy and in the amount of time students spend on tasks, Astin’s theory of involvement contends that “students learn by becoming involved” (1985, p. 133). He offers five fundamental principles: “1) involvement requires the investment of psychological and physical energy in “objects” (for
example, tasks, people, activities) of one sort or another, whether specific or highly general; 2) involvement is a continuous concept—different students will invest varying amounts of energy in different objects; 3) involvement has both quantitative and qualitative features; 4) the amount of learning or development is directly proportional to the quality and quantity of involvement; and 5) educational effectiveness of any policy or practice is related to its capacity to induce student involvement” (1985, pp. 135-136).

Astin’s theory is that student development and change depends on a complex interaction of factors internal and external to both student and institution.

Astin’s contentions deflect primary responsibility for student development and change from the institution to the student. Clearly, however, college leaders interested in the overall development of students are obligated to provide a wide variety of academic and social opportunities for students to become involved in the various components of the college community.

Tinto’s Theory of Student Attrition

Applying principles from the anthropological research of Arnold Van Gennep on rites of passage and from the sociological research on suicide of Emile Durkheim, Tinto (1987) has developed a theory of student departure. Conversely, it can also be seen as a theory of student persistence. It is similar to Astin’s involvement theory in that it ties together a number of features attributable to students, to the institution, and to the environment.

Tinto’s model is longitudinal and describes a complex interaction of phenomena internal and external to both the student and the institution. Tinto proposes that the
student enters college with various intentions and goals, which are affected by family background, personal skills and abilities, and previous education (p. 114). Through a collection of intellectual and social activities, the student develops degrees of social and intellectual integration into the college community. The student evaluates his/her intentions and commitments to goals and to the institution based on his/her level of satisfaction with academic and social integration. Also weighing outside commitments, the student makes a decision whether or when to leave college. Tinto theorizes that the more a student perceives and is comfortable with his/her academic and social integration, the greater will be his/her tendency to remain in college. Therefore, in addition to providing programs with rigorous academic quality, institutions should provide mechanisms for students to become viable members of social peer groups and especially to interact informally with instructors and other college personnel.

Pascarella’s Model

Pascarella (1985) has developed a model for assessing student growth and change based on indirect and direct effects of five sets of variables. With “learning and cognitive development” (p. 50) as the ultimate effect of the interaction of the five variable sets, Pascarella posits a major cluster of variables termed “institutional environment” (p. 50). This environment derives from two other collections of variables: an institution’s structural/organizational characteristics and the student’s background and “pre-college traits.” These three variable clusters combine to impact the fourth cluster, which involves the amount and quality of a student’s interaction with faculty, peers, and other “agents of socialization.” “Quality of student effort,” the fifth collection of variables, derives directly
from student background, institutional environment, and social interactions. The model attributes only indirect influence of institutional structure/organization (e.g., enrollment size, faculty-student ratio) to a student’s development and change.

The Transfer Rate

The percentage of students beginning higher education in community/junior colleges and then transferring to a senior institution, the transfer rate, has received much attention in the educational literature. Consistently, researchers have found on average that approximately 20 to 29% of community college students enroll subsequently at a senior institution; these figures include students with and without the associate degree (Palmer & Eaton, 1991). Lee and Frank (1990), used data drawn from a U.S. Department of Education longitudinal database called High School and Beyond (HS&B). They tracked graduates of the high school class of 1980 through 1982 and 1984 check points and found that 24% were enrolled in a four-year school after having attended a two-year college. Grubb (1991) analyzed cohorts from HS&B and from the National Longitudinal Study of the Class of 1972 (NLS72) and found the transfer rate for the former to be 20.2% and 28.7% for the latter. Examining the same 1972 cohort, Adelman (1988) calculated that 20% enrolled in a senior college after attending a two-year school.

The Transfer Assembly of the Center for the Study of Community Colleges at UCLA defined the transfer rate as “all students entering the community college in a given year who have no prior college experience and who complete at least 12 college-credit units within four years, divided into the number of that group who take one or more classes at a public, in-state university or college within four years” (Cohen and Sanchez,
In 1989 and again in 1990, the Transfer Assembly Project invited 240 two-year colleges to submit transfer data on students entering their institutions in 1984 and 1985; forty-eight institutions responded in 1989, 114 in 1990 (Cohen, 1991). The analysis was limited to students who had earned 12+ hours at the community college within four years, approximately 50%. Individual institutional transfer rates ranged from 2 to 78% of the one-half earning 12+ hours, but the mean rate was 23.7%. The sample was expanded, and in 1991 155 two-year colleges provided data on 1986 entrants; in 1992, 366 two-year colleges provided data on 1987 entrants. Again limiting the study to students earning 12+ hours within four years, the Transfer Assembly Project found a transfer percentage of 23.4% for 1986 entrants and a 22.6 rate for 1987 entrants (Cohen, 1994). The Center for the Study of Community Colleges collected data on over 540,000 students beginning the community college in 1990. Forty-seven percent had completed 12 credits within four years, and 62,000 had transferred to an institution fitting the Transfer Assembly definition. This calculates to a 21.8% transfer rate. The transfer rate has remained quite stable over the course of the Transfer Assembly's study.

Factors Influencing Transfer

A number of studies examine factors and issues related to students' tendency to transfer and persist at a senior institution. Non-academic factors discussed include those external to colleges, such as local economic vitality and other environmental conditions, as well as internal factors, such as student demographics and institutional resources and their expenditure. Academic variables are also studied, such as transfer student GPA, degree
completion, and course-taking behaviors. Armstrong and Mellissinos (1994) summarized a number of factors affecting student transfer. They cited the following:

- pressure of four-year institutions to improve access and outcomes for historically under-represented students,
- the declining economic value of a college degree,
- and an attitude on the part of the public that higher education has little value for many people now attending college...changes in student demographics and declines in academic preparation,
- the rise in student consumerism in the colleges,
- the decline of rigid course-taking patterns,
- the tracking of liberal arts and vocational students, and
- the 'all things to all people' approach of the community colleges. (p. 83)

In that context, Armstrong and Mellissinos investigated an organizational issue, the relationship between the proportion of liberal arts courses offered at two-year colleges and their transfer rate. They found that among schools with a transfer rate below the sample mean of 25 %, 69 % were also below the mean for the proportion of liberal arts courses offered in the college. Among colleges with a transfer rate above the mean, 63 % were high in liberal arts course offerings. A chi-square test confirmed that this relationship between categories was significant at the .05 level.

In a study of cognitive effects of two- and four-year colleges on students, Bohr, et al. (1994) examined freshman year gains in reading comprehension, mathematics, and critical thinking using scores on the Collegiate Assessment of Academic Proficiency. They found no statistically significant differences between two-year college and university samples in such cognitive measures. While emphasizing that this study is preliminary to a
longitudinal effort, the researchers tentatively concluded that a "general parity in the relative educational impact of two- and four-year institutions" (p. 9) may be possible. Thus social, environmental, economic and other factors impact the success of transfer students at the senior college as much or perhaps more than the academic preparation received at the community college.

In a study of the relationship between selected environmental factors and student transfer tendencies, Banks (1994) collected data from 78 public community colleges representing 15 states. She chose two dependent variables: 1) the percentage of first-time freshman students completing 12 or more credits during a 4-year period; and 2) the percentage of first-time freshman students with 12 or more credits transferring to a senior institution during a 4-year period. Via a step-wise multiple regression analysis, Banks examined a wide array of independent variables divided into three groups:

Conditions External to the College

- State articulation and transfer practices and policies.
- Percentage of city or county unemployment and median household income
- Proximity of senior institutions to the two-year college

Institutional Conditions Related to Resources and Expenditures

- Percentage of full-time faculty
- Whether faculty advising was mandatory
- College tuition
- Institutional expenditures per credit FTE
Institutional Conditions Related to Student Enrollment and Demographics

- Size of institution by credit enrollment
- Percentage of full-time students
- Percentage of students under 25 years of age
- Percentage of white students.

The results of the study show that income and presence of formalized inter-institutional mandates explained the largest portion of the variation in transfer rates, with a combined $R^2$ of 19. In the Resource and Expenditure group, Banks found that FTE expenditures and a greater number of full-time faculty are significantly related to transfer rates. In the Institutional Conditions category, students’ age (under 25) was significantly related to transfer likelihood.

Johnson (1987) used a causal modeling technique and well-established relationships among factors selected from published literature to develop a model of academic and non-academic factors affecting student persistence at transfer institutions. The exogenous (independent) variables included in the study were students’ academic self-concept; their educational aspirations; the practical value, as perceived by students, of their education; integration and involvement in the academic program; student perception of a program’s academic difficulty; and external factors such as family, job, and financial pressures.

The model’s factors accounted for 55% of the total explained variance in persistence for the total transfer student group. It accounted for 58% of the variance for men, 56% for women, 55% for juniors, and 47% for sophomores. A student’s intent to
return for subsequent semesters proved to be the most important factor in persistence. In addition, practical value, external factors, academic satisfaction, and academic performance variables were positively associated with intent to persist. Johnson found practical value as having the strongest association with academic satisfaction. Academic integration was also significantly associated with academic satisfaction. The external factors of various pressures were expected to have a direct, negative association with persistence and intent, but were found to have a positive relationship. Generally, the study found that a wide variety of academic factors is associated with student persistence, with the significance of the factors varying with gender and academic classification.

Focusing on adult, primarily immigrant Hispanic community college students, Kraemer (1995) examined “attitudes, cognitive and noncognitive experiences, and transfer-related behaviors” (p. 303) of graduates from a single private bilingual junior college to a number of senior institutions in Illinois. Data was collected from surveys completed by graduating students as well as from the two-year college registrar’s office and transfer center. Kraemer used structural equation modeling to test a structural model of student transfer based on the research of Cabrera, Nora, and Castaneda (1993). Three “pre-college” variables were considered: mathematics ability; family concerns; and encouragement to continue in college. Interaction between these variables and four intervening variables was investigated to determine influence on students’ intent to transfer and on actual transfer behavior. The four intervening variables were social integration, academic integration, English proficiency, and academic achievement. The
model also considered the impact of students’ educational goal and commitment to the two-year school attended on intent to transfer.

Kraemer hypothesized that the three exogenous variables would have an effect on academic integration, defined as participation in class discussions. She found that mathematics ability and encouragement had a statistically significant relationship to this variable. Likewise, the three pre-college variables were hypothesized to effect academic achievement, measured by cumulative GPA at graduation from the junior college; only mathematics ability showed statistical significance. Mathematics ability and encouragement were hypothesized to have an effect on satisfaction with English communications skills, defined as a student’s satisfaction with his/her oral English skills in ordinary conversation, ability to read college texts, ability to listen effectively to conversation, ability to listen effectively to a lecture, ability to speak to a group, and capacity to speak in class. Encouragement was the only variable that significantly explained English skills. Social integration was defined as the extent to which Hispanic students felt comfortable at the senior college due to the presence of Hispanic faculty and staff, other Hispanic students, and available Hispanic cultural activities. Family concerns and encouragement were hypothesized as significant to this variable; both were, with encouragement having the stronger influence. The researcher found that only Academic Achievement had significant explanatory value for the variable Goal Commitment, students’ stated educational goal for attending the two-year college. She had hypothesized that four other variables—encouragement, academic integration, English communication skills, and social integration would all be significant. These same five
variables were hypothesized to affect goal commitment. However, only two had significant explanatory value, academic integration, which had a negative influence, and social integration.

The first outcome measure, intent to transfer, was examined in relationship to seven variables: encouragement, academic integration, academic achievement, English communication skills, social integration, goal commitment, and institutional commitment. Only academic achievement was found to have significant explanatory value for this measure. The seven variables plus transfer intent were hypothesized to influence the second outcome measure, transfer behavior. Only academic achievement and transfer intent were found to be significant.

The researcher examined direct, indirect, and total effects of each variable on the two outcome measures. She found that transfer intent, academic achievement, and mathematics ability had significant influence of transfer behavior, while mathematics ability and academic achievement had significant impact on transfer intent.

In another study of a large number and variety of variables, Graham and Hughes (1994) studied 267 community college transfer students’ academic achievement at a four-year research university. The researchers examined 34 personal, demographic, and environmental variables. Data were gathered for this longitudinal study by a survey developed from research literature on student persistence and on characteristics of transfer students. Multiple regression analysis was performed to discover whether the student’s GPAs could be predicted with significant validity. The authors sought to provide advisors and admissions officials with information valuable in advising two-year college transfers.
A preliminary analysis of variance (ANOVA) allowed the authors to reduce the independent variables from 34 to 16, which were categorized into the Academic Background Cluster, the Academic and Environmental Support Cluster, the Educational Aspiration and Goal Commitment Cluster, and the Student Background Characteristic Cluster. Analysis revealed that no established cluster of variables was significantly associated with academic performance over four semesters at the four-year college. However, individual variables did show significant predictive value.

In predicting first semester university GPA, the community college transfer GPA, the intended place of residence, the student's estimate of his/her university GPA, and the receipt of the AA degree had significant predictive value and accounted for 23% of the total variance. Transfer GPA and AA degree completion was significant in predicting second semester university GPA, accounting for 20% of the total variance. For predicting the fourth semester university GPA, predictive value was found for anticipated GPA, transfer GPA from the two-year school, and the completion of the AA degree, combining to account for 33% of the variance.

The significance of completing the AA degree cited above supports the results of House (1989), who found that junior level status had a significant positive correlation with the success rates of two-year transfer students. He evaluated the computerized record of 14,689 students who had attended a large mid-western 4-year college. Two groups were studied, the first made up of students who transferred to the 4-year school in Fall 1980 or 1981. They were tracked for a 6-year period after transfer. The second study group consisted of students enrolled at the 4-year school in Fall 1986. Three
subgroups were established: new transfers from community colleges; continuing community college transfers; and continuing native students.

House found that community college students transferring as sophomores or juniors experienced a grade decrement compared to continuing native students of the same classifications. Transfer sophomores' mean GPA was 2.19, while native sophomores' mean GPA was 2.44. Transfer juniors had a mean GPA of 2.45 and native juniors' mean GPA was 2.56. Transfers classified as seniors had a higher mean GPA, 2.85, than did native seniors, 2.78. Continuing community college transfers had higher mean GPAs for all categories than did native students (2.49 to 2.44; 2.57 to 2.56; and 2.84 to 2.78). Using a Chi-square procedure, House also found that community college students transferring as freshmen and sophomores had significantly lower graduation rates than community college students who transferred as juniors. Juniors had a 68.8% graduation rate, while only 49.7% of freshmen and sophomores graduated. Differences in dismissal rates were also statistically significant. Only 8.5% of students transferring as juniors were dismissed for academic reasons, while 16.8% of transfer freshmen and sophomores were dismissed. House's report suggests that transferring with at least junior-level status may afford students more likelihood of success and persistence to graduation at the 4-year university.

In a study of California colleges, Dupraw and Michael (1995) also compared achievements of transfer and native student. The researchers considered data from three groups of students at the University of California at San Diego (UCSD). One was made up of students placing in the top eighth of their high school class. Another was made up
of students completing a 56-unit core of general education courses, with a specified minimum GPA, in the San Diego Community College District. The third group was composed of students who participated in an experimental transfer program called Transfer Admission Guarantee (TAG). These community college students entered into a contract with UCSD which guaranteed their admission to a California university, provided that they maintained a minimum GPA in a 56-hour general education core comparable to that of the other transfer group, designated Non-TAG (NTAG).

The purposes of the study were: 1) to determine whether significant differences existed in mean GPAs among sample from the three groups (native, TAG, NTAG), considering gender and ethnicity as variables; 2) to determine whether a significant difference existed after three quarters of their junior year in the mean GPAs of TAG students with a transfer GPA of 2.40-2.79 and those with a transfer GPA of at least 2.8; 3) to determine on the bases of gender and ethnicity whether within TAG and NTAG samples significant differences existed in mean GPAs at the senior college after three quarters; 4) to determine whether mean GPAs differed across three majors: mathematics/science, social science, and humanities after three quarters for the two transfer groups and the native group; and 5) to determine whether the TAG and NTAG students’ GPAs during the three quarters had predictive validity for success at the four-year college.

The researchers found that, at the end of three quarters, the native students’ mean GPA of 3.03 was significantly higher than the TAG students’ GPA of 2.83 and the NTAG students’ GPA of 2.86. The .03 difference between the two transfer group GPAs was not
statistically significant. Other results were: TAG and NTAG students performed at comparable levels regardless of gender or ethnic classification, although this was a tentative conclusion due to sample size; the preparation of both TAG and NTAG students appeared to offer them a better opportunity to succeed in a humanities major at the University of California, San Diego (USCD) than in a mathematics/science or social science major; and a change in the minimum transfer GPA required by UCSD from 2.4 in fall 1988 to 2.8 in fall 1990 was associated with a higher level of academic success and less attrition of transfer students. In sum, the articulation agreement between the university and the San Diego Community College system appears to promote persistence and success of transfer students.

The success of transfer students compared to native students was the focus of a study performed by Anglin, Davis, and Mooradian (1995). They compared attrition and graduation rates of those groups of students at a large residential university, Kent State, the transfers having come from an urban two-year school, Cuyahoga Community College.

The matched transfer-native comparison showed that the transfer students' graduation rate was equal to or superior to their native counterparts. GPA comparisons after the second and fifth years at Kent State yielded no significant differences. Attrition rates were significantly different. Transfer students who dropped out tended to do so with significantly higher GPAs and more semester hours completed than native student drop outs. They were also at a greater risk for dropping out during their first four semesters than the native students during their first four semesters. For this study, attrition was defined as failure to enroll for three consecutive semesters.
Results were also established comparing non-Caucasian transfer to non-Caucasian native students. The transfer students performed just as well as native non-Caucasians; however, all non-Caucasians, transfer and native, were the least likely to complete a bachelor's degree and the most likely to leave school. These results are cautionary since minority students were under-represented in the transfer sample.

Palmer and Pugh (1993) studied transcripts of baccalaureate recipients from six Virginia public universities to determine the students' enrollment histories, and specifically to investigate the contribution of community colleges to the students' education. They concluded that community colleges were not providers of "curricular paths" for transfer students (p. 54). Rather, students attended two-year schools irregularly and accumulated a wide variety in the number and type of courses taken. However, the researchers found that the clear majority of courses taken for transfer were in the Arts and Sciences and have broad application for baccalaureate degrees. These findings support Adelman's conclusion that community college function "in a variety of 'occasional' roles in the lives of individuals," satisfying their need "to engage in learning on their own terms, and in their own time" (1992, p. v.).

Intending to test whether students' community college experiences exert "some disadvantage on [these] transfer students' persistence in higher education, compared with their counterparts whose entire undergraduate experience was in a four-year institution" (1993, p. 87), Lee, Mackie-Lewis, and Marks focused on high school seniors graduating in 1980. They tracked two groups, one whose members first attended a community college, the other whose members began and finished their higher education at a four-year
college or university. The investigators gathered data on the status of the groups in 1982, 1984, and 1986. The major finding of this study was that virtually equal percentages of the groups persisted to graduation from a four-year college: 68.8% of "four-year students" and 68.9% of transfer students. They also found no significant differences in the probabilities of students in these two groups being in graduate school by 1986 or expressing intention or aspirations to attend graduate school. The researchers contended that although community colleges "do not act as 'transformational' institutions for the considerable number of students who come to them with social and academic disadvantages, neither do they act as 'residual inhibitors' for the relatively able and motivated students" (p. 105).

In a study of students transferring from a large suburban community college to a moderately selective urban university, Townsend, et al. determined selected predictors of transfer student performance. They found community college GPA to be the most significant predictor of university GPA. The second best predictor was found to be a student's "College Aptitude Rating" or CAR score. This is a combination of scores developed by the receiving university consisting of the student's high school rank percentile and the percentile of either ACT composite score or SAT Verbal and Math percentile, whichever was higher.

Baldwin (1994) examined transcripts from Miami-Dade Community College (M-DCC) and from the Florida State University System, with the intent of identifying predictors of upper division GPA. The study was limited to Miami-Dade students who
earned an A. A. degree in business/management, computer science, or engineering prior to transfer to one of five state four-year institutions.

Baldwin found that a student's GPA at M-DCC explained the greatest percentage of variance (36%) of the cumulative university GPA. The second largest contributor (27%) was the scaled score on the mathematics portion of the CLAST (College Level Academic Skills Test). Another variable significant at the .05 level was number of "tier 1" credits earned at the community college. Tier 1 courses were defined as "critical major courses," those required by the university system schools and deemed essential for the respective major at M-DCC (p. 116). This study also showed that 73% of M-DCC graduates with a transfer GPA of 2.0-2.4 had a university GPA of less than 2.0. Fifty-seven percent had a university GPA of less than 2.0 with a M-DCC GPA of 2.5 to 2.9. Overall, students with a transfer GPA of less than 3.0 were associated with 83 percent of the university failures in the sample.

Students with inadequate or minimally adequate grades in Tier 1 courses tended to perform less well at the university. Of those with university GPAs less than 2.0, 44% had M-DCC "major" GPAs of 2.4 or less. Conversely, only 9% of students with university GPAs of 3.5 or higher had M-DCC GPAs below 2.5. Overall, 77% of the sample not performing well academically at a university had critical major course GPAs of less than 3.0. The author concluded that success at M-DCC, especially in "Tier 1 courses," generally predicted success at the senior institution.

In a study comparing the transfer shock of a total sample to discipline-specific subgroups within the sample, Cejda (1997) studied 100 students transferring from a two-year
college to Benedictine College. Cejda identified five sub-groups based on students' majors at the receiving institution: business, education, fine arts and humanities, mathematics/sciences, and social science.

Cejda found that students with majors in education, social science, and fine arts/humanities experienced an increase in post-transfer GPA. In other words, they did not experience transfer shock. Students majoring in business and mathematics/sciences suffered a decrease in GPA post-transfer. Therefore, the investigator performed planned comparisons for these groups. He found that for both major types the mean transfer shock differed significantly from the mean transfer shock of the entire sample. For business majors, $t(15) = -3.990$, $p<.01$ and for mathematics/science majors $t(23) = -3.951$, $p<.01$.

This study provided preliminary evidence for a profitable method to study community college transfer students while at the senior institution to examine success. To generalize the success or lack of success of transfer students across disciplines may be inaccurate and present a distorted picture of transfer students' abilities and preparedness.

Seeking to test the hypothesis that "time of transfer and number of credits student acquired at two-year colleges were determinants of their performance at the senior institution" (p.34), Best and Gehring (1993) studied students transferring within Kentucky. The researchers found that transfer juniors, students with at least 60 semester hours, had a mean GPA significantly higher than the mean for transfer students with fewer than 60 credits, termed lower division transfers. The mean GPAs of upper division transfers were compared to native university juniors and found not to be significantly
different. Likewise, the graduation rate for transfer juniors was significantly higher than the rate for lower division transfers. The authors did find, however, that the native university juniors graduated at a significantly higher rate (60.4%) than the transfer juniors (40.1%). They concluded that community college students should be encouraged to complete two full years of academic work before transferring and to learn as much as possible about social and academic conditions at the transfer institution before actually transferring.

Summary

In their encyclopedic How College Affects Students (1991), Pascarella and Terrenzini summarized transfer research of the previous twenty years. They reported that published research consistently found "students entering a four-year institution are substantially more likely than two-year college entrants to persist in their education, to complete a baccalaureate degree, and to attend graduate or professional school" (p. 641). Dougherty (1994) concluded that community colleges have "a contradictory impact" on their students (p. 57). He found that persons aspiring to the baccalaureate degree achieve one less often if they first attend a community college rather than begin at a four-year institution. However, those desiring a credential below the bachelors "appear to receive more years of education, but perhaps fewer baccalaureate degrees" (p. 57).

The research reviewed in this section offers conclusive support for neither viewpoint. Investigators have found a wide range of results when comparing transfer students to native students and when attempting to identify the best preparatory experiences for students wishing to transfer. The bias inherent in Terrenzini’s and
Pascarella’s above conclusion is that students enter a two-year institution with the intent to transfer. That a number do intend transfer cannot be doubted or disputed. But given the multiple functions of community/junior colleges, to measure their success only or mostly by their transfer students’ persistence to the bachelor’s degree is myopic.

Dougherty’s observations indicate some appreciation of the scope requisite to evaluate the two-year college in all of its purposes.

The research reviewed here demonstrates that a number of perspectives must be taken to determine the value of beginning one’s higher education at a two-year college. A range of conclusions has been presented with respect to that value, including the need for academic rigor and overall student development opportunities on the part of institutions, and commitment, involvement, and preparation on the part of the student.
CHAPTER III

METHODS AND PROCEDURES

Introduction

This chapter outlines the methods and procedures utilized for this study. Topics discussed include the selection of the sample, procedures for data collection, obtaining permission to conduct the study, research questions, and procedures for analysis of the data.

Selection of the Sample and Collection of the Data

The University of North Texas (UNT) was chosen as the source for the sample because of the number of transfer students it receives each year. In the Fall 1995 semester, two-year college transfers comprised 9.1%, 1700 students, of the University's undergraduate enrollment of 18,654 (Factbook 1995-96, p. 35). Each fall UNT holds a transfer meeting, in which UNT administration and faculty present to representatives of two-year schools requirements and incentives for their students to transfer to UNT. The University recognizes the value of its transfer population and seeks to enhance the number and quality of transfer students.

The Office of the Registrar at UNT produced the student sample for the study, responding to a written data request. The Office randomly selected 150 students who transferred to UNT from public two-year colleges in the Fall semester of 1990 with a minimum of 12 transferable (college-level) hours. After examination of the sample, 36
students and their respective records were removed from the sample. These students had either attended a four-year college in addition to a public community college before transfer to UNT, or they had attended a two-year college that was either proprietary or private. Thus the final sample of 114 students had only public two-year collegiate education before transfer. This provided just over 16 cases for each of the 7 independent variables, exceeding the minimum of 15 recommended by statisticians (Borg & Gall, 1989). For each subject in the sample, the UNT Registrar’s Office provided the following:

1. The student’s cumulative grade point average (GPA) achieved at the two-year college, exclusive of developmental/remedial courses.

2. The student’s date of birth. This was used to calculate each student’s age in months to produce a continuous variable.

3. The student’s ethnicity. This was listed merely as “White” or “Other.” International students were excluded.

4. The student’s gender.

5. The student’s GPA over the duration of the study’s time line, which was Fall 1990 through Spring 1995.

In addition, the UNT Registrar’s Office provided hard copies of student transcripts so that the following could be counted:

1. The total number of college-level (non-developmental) credit hours earned at the two-year institution.
2. The number of “core courses” successfully completed at the two-year institution.

3. The student’s full-time status, by semester, while attending the two-year college.

3. The number of long (fall or spring) semesters in which the student successfully completed (with a “C” or better) at least one course at UNT.

4. The number of credit hours earned in each semester at UNT.

The data was attributed to a given student by means of an arbitrary number assigned by the UNT Registrar’s Office. Student records were the only data source. No student was interviewed, nor was a survey instrument used.

Permission to Conduct the Study

On August 12, 1996, a letter requesting access to UNT data on transfer students was sent to the office of Dr. Virginia Wheeless, Associate Vice-President for Planning & Special Assistant to the Chancellor at the University. The letter described a proposed study which would examine transfer student persistence and success. That letter was forwarded to Joneel Harris, Registrar at UNT, as evidenced by an E-Mail message dated August 27, 1996. In the same E-Mail message, Ms. Harris indicated her ability and desire to provide data requested for this study. Copies of the letter and E-mail message are in Appendix A and B, respectively.

Hypotheses to be Tested

Fourteen null hypotheses were tested for this study:
1. A student's cumulative community college transfer GPA is not a statistically significant predictor of his/her persistence at the senior institution.

2. The total number of college-level credits earned at the two-year school is not a statistically significant predictor of the student's persistence at the senior institution.

3. The number of "core courses" successfully completed at the two-year school is not a statistically significant predictor of a student's persistence at the senior institution.

4. A student's age at the time of transfer is not a statistically significant predictor of his/her persistence at the senior institution.

5. A student's ethnicity is not a statistically significant predictor of his/her persistence at the senior institution.

6. A student's gender is not a statistically significant predictor of his/her persistence at the senior institution.

7. A student's full-time status while at the two-year college is not a statistically significant predictor of his/her persistence at the senior institution.

8. A student's cumulative community college transfer GPA is not a statistically significant predictor of his/her grade point average at the senior institution.
9. The total number of college-level credits earned at the two-year school is not a statistically significant predictor of the student's grade point average at the senior institution.

10. The number of "core courses" successfully completed at the two-year school is not a statistically significant predictor of a student's grade point average at the senior institution.

11. A student's age at the time of transfer is not a statistically significant predictor of his/her grade point average at the senior institution.

12. A student's ethnicity is not a statistically significant predictor of his/her grade point average at the senior institution.

13. A student's gender is not a statistically significant predictor of his/her grade point average at the senior institution.

14. A student's full-time status while at the two-year college is not a statistically significant predictor of his/her grade point average at the senior institution.

Procedures for the Analysis of the Data

The data for the seven predictor variables were down-loaded or keyed-in to the Statistical Program for the Social Sciences (SPSS) for Windows. SPSS offers a variety of descriptive and inferential statistical techniques appropriate for educational research. Because this study sought to determine the predictive validity of variables on student persistence, multiple linear regression analysis was chosen as the statistical procedure. Hinkle, Wiersma, and Jurs provide the standard description of multiple linear regression:
scores on the criterion variable (Y) are predicted using k (k≥2) predictor variables (X_1, X_2, ..., X_k) (p. 460).

A particular approach to multiple linear regression analysis, the stepwise solution, was chosen for this study. This analysis examines each predictor variable as it is added to the regression model and determines its contribution relative to previously entered variables. Pedhazur (1982), in the standard text for applied regression analysis, explains:

In Stepwise Selection, tests are performed at each step to determine the contribution of each predictor already in the equation if it were to enter last. It is thus possible to identify predictors that were considered to be “good” at an earlier stage but have lost their usefulness when additional predictors were brought into the equation and may therefore be removed from it. (p. 160)

Thus, the stepwise solution provided the means for determining the best combination of predictor variables for this study. Results were presented in both graphical and interpretive discourse formats.
CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

This study investigated the predictive value of seven independent variables upon the persistence of community college transfer students at a four-year university. Likewise, the study sought whether these seven variables predicted students’ university GPA. The independent variables were community college transfer GPA, number of college-level credits earned at the two-year college, number of “core” courses completed at the two-year college, the student’s gender, the student’s ethnicity, the student’s age, and the student’s full-time status while attending the two-year college. Step-wise multiple regression analysis was performed to determine the significance of the predictor variables. Significance at the .05 level was the criterion for entry of a variable into the regression equation; a variable was removed if entry of subsequent variables increased its alpha level to a level greater than .10.

Descriptive Statistics of Sample

Table 1 displays the descriptive statistics for the four academic independent variables used in the study: transfer GPA from the community college, total transferrable credits earned at the community college, number of core courses completed at the community college, and students’ full-time status while attending the two-year college. Sample size for the study was reduced from the original 150 students to 114. This was
necessary to eliminate students who had other than exclusively two-year college
experience prior to transfer to the university.

Table 1 (N=114)

<table>
<thead>
<tr>
<th>Descriptive Statistics of Academic Predictor Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Comm. Coll. GPA</td>
</tr>
<tr>
<td>Comm. Coll. Credits</td>
</tr>
<tr>
<td>Core Courses</td>
</tr>
<tr>
<td>Full-Time Status</td>
</tr>
</tbody>
</table>

Students' cumulative community college transfer GPA was chosen as an
independent variable for the study. This GPA excluded grade points earned in remedial/
developmental courses. Table 1 indicates that the mean transfer GPA of the sample was
2.87, with a standard deviation of .57 and range of 1.41 to 4.00.

The total number of transferrable credit hours earned at the two-year college was
also chosen as an independent variable for the study. Table 1 indicates that the range of
hours completed was from 106 to 13; the mean number of hours completed was 47.24,
with a standard deviation of 18.05. Developmental studies hours were excluded from this
variable's calculation.

In addition, the number of core courses that a student completed at the two-year
institution was chosen as an independent variable. For purposes of the study, core courses
were defined as Freshman English I, American History I or American History II, Speech,
Introductory Computer Science, Math, and a Natural Science course with lab. Table 1
indicates that the mean number of core courses for the sample was 4.58, with a standard deviation of 1.59. The range in core courses taken was 7 to 0.

The independent variable of full time status at the two-year college was calculated and entered into the regression equation as a decimal. The number of long semesters in which the student was full time, i.e., completed 12 or more hours, was divided by the total number of long semesters the student was enrolled from Fall 1990 through Spring 1995. This method provided for a maximum value of 1.0 and a minimum of 0.0, which was the actual range in the sample. A value of 1.0 indicated that the student was full time every long semester attending, while a value of 0.0 indicated that the student attended only on a part-time basis. The mean full time value was .48, with a standard deviation of .32.

Demographics of Sample

Table 2 displays the demographic categories of age, gender, and ethnicity, which were the remaining three predictor variables in the study. Fifty-three of the students in the sample were male, 61 female. Thus the sample composition was 46.49% male and 53.51% female. Far more whites, 90, than non-whites, 24, were in the sample. The percentage distribution was 78.95% white and 21.05% non-white. The variable “age” ranged from 18-48. Fifty-nine students were between 18 and 20; thirty-eight between 21 and 23; seven between 24 and 29; six between 30 and 35; and the remaining four students were over 40 years of age.
Table 2 (N=114)

Descriptive Statistics for Demographic Predictor Variables

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Students</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>46.49%</td>
</tr>
<tr>
<td>Female</td>
<td>61</td>
<td>53.51%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-20</td>
<td>59</td>
<td>51.75%</td>
</tr>
<tr>
<td>21-23</td>
<td>38</td>
<td>33.33%</td>
</tr>
<tr>
<td>24-29</td>
<td>7</td>
<td>6.14%</td>
</tr>
<tr>
<td>30-35</td>
<td>6</td>
<td>5.26%</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>4</td>
<td>3.5%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>90</td>
<td>78.95%</td>
</tr>
<tr>
<td>Non-White</td>
<td>24</td>
<td>21.05%</td>
</tr>
</tbody>
</table>

Results of Regression Analysis

In the regression analysis, the number of semesters a student completed at the receiving four-year university by passing at least one course was the dependent variable to examine persistence. Results of the step-wise multiple regression procedure using all independent variables indicated that no independent variable had predictive significance. Subsequent to this analysis, a demographic subset of “age,” “ethnicity,” and “gender” was also entered into a regression equation in an attempt to remove variation from the dependent variable. However, none of the variables in the subset, nor the subset, was chosen for the equation. Likewise, an academic subset of independent variables of “core courses” completed at the two-year college, “transfer GPA,” “full-time status” while
attending the two-year college, and "number of hours" completed at the two-year college was entered into a regression equation. Again, neither the subset nor any single variable was chosen for entry into the equation. All null hypotheses were accepted.

Hypotheses Tested

Hypothesis One

Hypothesis one stated that a student's cumulative community college transfer GPA would not be a statistically significant predictor of his/her persistence at the senior institution. The stepwise multiple linear regression procedure applied through Statistical Package for the Social Sciences (SPSS) failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for persistence at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the first hypothesis was accepted.

Hypothesis Two

Hypothesis two stated that the total number of college-level credits earned at the two-year school would not be a statistically significant predictor of the student's persistence at the senior institution. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for persistence at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the second hypothesis was accepted.
Hypothesis Three

Hypothesis three stated that the number of "core courses" successfully completed at the two-year school would not be a statistically significant predictor of the student's persistence at the senior institution. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for persistence at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the third hypothesis was accepted.

Hypothesis Four

Hypothesis four stated that a student's age at the time of transfer would not be a statistically significant predictor of his/her persistence at the senior institution. In this study, student age was recorded in months to provide more of a continuous variable than would have been examined had age been recorded in years. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for persistence at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the fourth hypothesis was accepted.

Hypothesis Five

Hypothesis five stated that a student's ethnicity would not be a statistically significant predictor of his/her persistence at the senior institution. For this study,
ethnicity was recorded as either "White" or "Non-White," a false dichotomous variable, which was entered arbitrarily into SPSS as "1" for "White" and "0" for "Non-White." The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for persistence at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the fifth hypothesis was accepted.

Hypothesis Six

Hypothesis six stated that a student's gender would not be a statistically significant predictor of his/her persistence at the senior institution. Gender is a true dichotomy and was entered arbitrarily into SPSS as "1" for "male" and "0" for "female." The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for persistence at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the sixth hypothesis was accepted.

Hypothesis Seven

Hypothesis seven stated that a student's full-time status while at the two-year college would not be a statistically significant predictor of his/her persistence at the senior institution. Values for this variable were entered into SPSS as decimals, with a range of 0.00 to 1.00. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this
independent variable had no statistically significant predictive value for persistence at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the seventh hypothesis was accepted.

Hypothesis Eight

Hypothesis eight stated that a student’s cumulative community college transfer GPA would not be a statistically significant predictor of his/her university grade point average. Table 3 presents the results of the stepwise multiple regression analysis for community college GPA as a predictor of university GPA.

Table 3

Summary of Stepwise Multiple Regression

<table>
<thead>
<tr>
<th>Step 1</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Multiple R</td>
<td>.39272</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R Square</td>
<td>.15423</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjusted R Square</td>
<td>.14668</td>
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</tr>
<tr>
<td></td>
<td>Standard Error</td>
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</table>

<table>
<thead>
<tr>
<th>Analysis of Variance</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
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<tbody>
<tr>
<td>Regression</td>
<td>1</td>
<td>18.16059</td>
<td>18.16059</td>
</tr>
<tr>
<td>Residual</td>
<td>112</td>
<td>99.59001</td>
<td>.88920</td>
</tr>
</tbody>
</table>

F = 20.42360*
*p<.05

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm. Coll. GPA</td>
<td>.705588</td>
<td>.156130</td>
<td>.392720</td>
</tr>
<tr>
<td>(Constant)</td>
<td>.227447</td>
<td>.456135</td>
<td></td>
</tr>
</tbody>
</table>
The F-value of 20.42360 exceeds the critical F-value; because this independent variable predicts a non-zero relationship between itself and the dependent variable, hypothesis eight was rejected.

Hypothesis Nine

Hypothesis nine stated that the total number of college-level credits earned at the two-year school would not be a statistically significant predictor of the student's grade point average at the senior institution. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for grade point average at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the ninth hypothesis was accepted.

Hypothesis Ten

Hypothesis ten stated that the number of "core courses" successfully completed at the two-year school would not be a statistically significant predictor of the student's grade point average at the senior institution. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for grade point average at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the tenth hypothesis was accepted.
Hypothesis Eleven

Hypothesis eleven stated that a student’s age at the time of transfer would not be a statistically significant predictor of his/her grade point average at the senior institution. In this study, student age was recorded in months to provide more of a continuous variable than would have been examined had age been recorded in years. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for grade point average at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the eleventh hypothesis was accepted.

Hypothesis Twelve

Hypothesis twelve stated that a student’s ethnicity would not be a statistically significant predictor of his/her grade point average at the senior institution. For this study, ethnicity was recorded as either “White” or “Non-White,” a false dichotomous variable, which was entered arbitrarily into SPSS as “1” for “White” and “0” for “Non-White.” The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for grade point average at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the twelfth hypothesis was accepted.
Hypothesis Thirteen

Hypothesis thirteen stated that a student's gender would not be a statistically significant predictor of his/her grade point average at the senior institution. Gender is a true dichotomy and was entered arbitrarily into SPSS as "1" for "male" and "0" for "female." The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for grade point average at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the thirteenth hypothesis was accepted.

Hypothesis Fourteen

Hypothesis fourteen stated that a student's full-time status while at the two-year college would not be a statistically significant predictor of his/her grade point average at the senior institution. Values for this variable were entered into SPSS as decimals, with a range of 0.00 to 1.00. The stepwise multiple linear regression procedure applied through SPSS failed to select this independent variable for the regression equation. Therefore, this independent variable had no statistically significant predictive value for grade point average at the four year university and predicts a zero relationship between this independent variable and the dependent variable in the population. Thus, the fourteenth hypothesis was accepted.

In summary, seven independent variables were regressed on each of two criterion variables: persistence of community college transfer students and their grade point average at the University of North Texas. Of the fourteen hypotheses generated for this analysis,
only one was rejected: grade point average transferred to UNT was found to have statistically significant predictive value for university grade point average. No other predictor variable was found to be significant, either in predicting persistence at the university or in predicting university grade point average.
CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of the study was to determine whether age, ethnicity, gender, and the selected community college academic variables of cumulative GPA, total transferrable credits, number of core courses completed, and full-time status had predictive value for transfer students' likelihood of persisting at a four-year college or predicted the students' GPA at the university. Stepwise multiple linear regression analysis was chosen to make these determinations.

Summary of the Major Findings

This study examined the predictive value of seven independent variables on the dependent variables of persistence and GPA among community college transfer students at a four-year university. Persistence was measured by counting the number of long semesters in which the students completed at least one course with a "C" at the university. The step-wise multiple regression procedure failed to select any independent variable as significant in predicting persistence; therefore, all seven null hypotheses were accepted. The regression procedure selected only community college GPA as having significant predictive value for university GPA; thus six of seven null hypotheses related to university GPA were accepted. The seven predictor variables were: age, gender, ethnicity, GPA transferred from the community college, the number of transferrable hours earned at the
community college, the number of seven “core” courses completed at the community college, and the percentage of full-time attendance at the community college.

Discussion of the Regression Analysis

One challenge in multiple regression analysis is to pick predictor variables which are highly correlated with the criterion variable but which have low correlations among themselves. These relationships permit discovery of the different proportions of variance accounted for by each of the predictor variables. If predictor variables are highly correlated with the dependent variable but are also highly correlated with one another, they are redundant, explaining the same variation in the dependent variable (Hinkle, Wiersma, and Jurs, p. 470-471).

Therefore, correlation coefficients were calculated among all predictor variables and between predictor variables and the first criterion variable, which was numbers of semesters persisting at the university. The resulting coefficients are shown in Table 4. The calculations demonstrate that, with the exception of the last pair, very little or no correlation exists between each pair of predictor variables. Even the correlation of .586 between cumulative community college GPA and number of core courses completed represents only a moderate positive correlation. Thus, among the predictor variables listed above, the desirable condition of low correlation held true.
Table 4

**Correlations Among Continuous Predictor Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pearson r</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.048</td>
</tr>
<tr>
<td>Comm. Coll. GPA</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.204</td>
</tr>
<tr>
<td>Core Courses</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.019</td>
</tr>
<tr>
<td>Full-Time Status</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.014</td>
</tr>
<tr>
<td>Comm. Coll. Credits</td>
<td></td>
</tr>
<tr>
<td>Full-Time Status</td>
<td>.058</td>
</tr>
<tr>
<td>Comm. Coll. Credits</td>
<td></td>
</tr>
<tr>
<td>Full-Time Status</td>
<td>.289</td>
</tr>
<tr>
<td>Comm. Coll. GPA</td>
<td></td>
</tr>
<tr>
<td>Full-Time Status</td>
<td>.000</td>
</tr>
<tr>
<td>Core Courses</td>
<td></td>
</tr>
<tr>
<td>Comm. Coll. Credits</td>
<td>.016</td>
</tr>
<tr>
<td>Core Courses</td>
<td></td>
</tr>
<tr>
<td>Comm. Coll. GPA</td>
<td>.000</td>
</tr>
<tr>
<td>Core Courses</td>
<td>.586</td>
</tr>
</tbody>
</table>

Because two of the predictor variables, gender and ethnicity, were dichotomous variables, special cases of the Pearson r correlation coefficient must be used. To determine the correlation between gender and ethnicity, the phi (ϕ) coefficient was calculated. Table 5 shows the result, which demonstrates the hoped-for low correlation.

Table 5

**Correlation Between Gender and Ethnicity**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Phi (ϕ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.136</td>
</tr>
<tr>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
</tbody>
</table>
To determine the correlations between gender and the 5 continuous predictor variables and between ethnicity and the 5 continuous predictor variables, yet another variation of the Pearson $r$ must be used. The Point-Biserial correlation coefficient is the special case of the Pearson $r$ appropriate to measure correlation between one continuous variable and another variable which is dichotomous. Table 6 summarizes the correlations.

Table 6

<table>
<thead>
<tr>
<th>Variables</th>
<th>Point-Biserial Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>X Ethnicity</td>
<td>Y Comm. Coll. GPA</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.027</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Comm. Coll. Credits</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.064</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Core Courses</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.079</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Full-Time Status</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.036</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Age</td>
</tr>
<tr>
<td>Gender</td>
<td>.12</td>
</tr>
<tr>
<td>Gender</td>
<td>Comm. Coll. GPA</td>
</tr>
<tr>
<td>Gender</td>
<td>.154</td>
</tr>
<tr>
<td>Gender</td>
<td>Comm. Coll. Credits</td>
</tr>
<tr>
<td>Gender</td>
<td>.011</td>
</tr>
<tr>
<td>Gender</td>
<td>Core Courses</td>
</tr>
<tr>
<td>Gender</td>
<td>.026</td>
</tr>
<tr>
<td>Gender</td>
<td>Full-Time Status</td>
</tr>
<tr>
<td>Gender</td>
<td>.018</td>
</tr>
<tr>
<td>Gender</td>
<td>Age</td>
</tr>
<tr>
<td>Gender</td>
<td>.049</td>
</tr>
</tbody>
</table>

Once again, virtually no correlation exists between these predictor variables, which is an essential condition for determining whether they have predictive value for the criterion variable. It has already been demonstrated, however, that no independent variable was chosen in the step-wise multiple regression analysis. Therefore, the inference
can be made that the predictor variables had very little or no correlation with the
dependent variable, persistence, either. This conclusion is supported by the data in Table 7, which presents the correlations found between each predictor variable and the criterion variable of persistence at the four-year college. Persistence was measured by the number of long semesters the student was enrolled for at least one course at the university.

Because the predictor variables Gender and Ethnicity are dichotomous, the version of the Pearson Product-Moment Correlation Coefficient known as Point-Biserial was calculated.

The remaining five variables were correlated using the standard Pearson r for continuous variables.

Table 7

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pearson r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td>.006</td>
</tr>
<tr>
<td>Gender</td>
<td>.046</td>
</tr>
<tr>
<td>Age</td>
<td>.142</td>
</tr>
<tr>
<td>Comm. Coll. Credits</td>
<td>.454</td>
</tr>
<tr>
<td>Comm. Coll. GPA</td>
<td>.386</td>
</tr>
<tr>
<td>Core Courses</td>
<td>.835</td>
</tr>
<tr>
<td>Full-Time Status</td>
<td>.469</td>
</tr>
</tbody>
</table>

These results demonstrate that, with one exception, a low or negligible correlation exists between the predictor variables and the dependent variable, which is an undesirable relationship. As mentioned above, the desired condition is a low correlation among
predictor variables but a high correlation between predictors and the criterion variable.

The single exception is the correlation between the number of core courses completed and persistence, which is .835; this is a high positive correlation. The $R^2$ is .697, indicating that over 69% of the variance in persistence can be associated with the variance in core courses completed. However, this result is somewhat misleading. The mean number of core courses taken by the transfer students was 4.58, the standard deviation 1.59, and the range of values for core courses was 0-7. The range of values for persistence—as measured by number of long semesters attending the four-year college—was 0-10. The mean number of terms attended was 4.05, the standard deviation 2.9. Thus, the merest change in core course data would have a sizeable effect on the variance associated with persistence, which has a limited range. The high correlation is thus somewhat artificial.

Hence, the failure of the step-wise multiple regression analysis to choose any variable as having predictive significance for persistence can be explained, at least in part, by the low correlations between predictor variables and the criterion variable.

The possibility of finding significance among the predictor variables may also have been compromised by choosing transfer students to a single four-year university. The University of North Texas is the major public university of northern Texas and as such receives a large number of students in transfer. This study's sample of 114 transfer students was composed largely of students from the Dallas Community College District and from Collin County Community College and Tyler Junior College. While the sample did contain students from 34 two-year college, Table 8 shows that 72% of the sample was drawn from only 3 community college districts.
Table 8

Selected Two-Year Colleges in the Sample

<table>
<thead>
<tr>
<th>Two-Year College</th>
<th>Number of Students</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas County</td>
<td>52</td>
<td>45.6%</td>
</tr>
<tr>
<td>Collin County</td>
<td>15</td>
<td>13.2%</td>
</tr>
<tr>
<td>Tyler Junior College</td>
<td>15</td>
<td>13.2%</td>
</tr>
<tr>
<td>Grayson County</td>
<td>7</td>
<td>6.1%</td>
</tr>
<tr>
<td>Navarro College</td>
<td>5</td>
<td>4.4%</td>
</tr>
<tr>
<td>North Central</td>
<td>4</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

Although the sample was randomly selected via computer, the transfer student population clearly is heavily supplied by the Dallas Community College District. Thus, the sample for this study may contain a sufficient number students whose homogeneity across numerous variables prohibits enough variance to make prediction and correlation statistically significant.

The second regression analysis, with university GPA as the dependent variable, yielded only one of the seven predictor variables as having statistically significant predictive value, cumulative community college GPA. This finding is similar to a result of Graham and Hughes (1994), who found transfer GPA showed predictive value of first, second, and fourth semester GPA at a university. Graham and Hughes found that clusters of predictor variables, which included transfer GPA, students’ intended place of residence, receipt of the AA degree, and students’ expected university GPA were selected in their stepwise multiple regression analysis. These results are compromised, however, because
the researchers chose not to examine a random sample of transfer students. Rather, they asked all 348 members of a fall orientation course to complete a survey over personal characteristics, academic background, community college experiences, and selected environmental conditions. Two-hundred and sixty-eight students completed the survey. In addition, they reported that 48 of the 268 students did not complete their first semester and so “the smaller group of 200 individuals” (p. 455) was used as the sample for the study. Whether the result of an error in subtraction or merely a typographical mistake, the 200 figure lends further suspicion to the validity of the study’s findings.

In Kraemer’s study (1995) of Hispanic student transfer behavior, the variable Academic Achievement, measured by GPA, was found to have significant influence on the dependent variable termed Transfer Behavior. Transfer Behavior was defined as actually transferring from a two-year college to a four-year institution. This finding, however, is only marginally related to the results of the current study, since Kraemer did not address persistence at the four-year university. Likewise, the population and the derived sample were Hispanic students. In studies related to Kraemer’s, community college GPA was found to have a strong influence on persistence (Cabrera, Nora, and Castaneda, 1992, 1993).

Conclusions

The only conclusion supported by the stepwise multiple regression analysis in this study is that community college cumulative GPA is a statistically valid predictor of GPA at the university.
Recommendations for Additional Research and

Administrative Practice

Persistence studies in the extant literature consistently ignore the persistence and success of transfer students as a group unto themselves. Researchers tend to compare the persistence, grade point averages, and graduation rates of native students to those of two-year college transfer students. Such comparisons are to be expected but also beg a fundamental question, which is whether transfer students’ accomplishments should be expected to match those of native students. In Texas, for example, all public two-year colleges have open-door admissions policies. These policies allow for the enrollment in college of thousands of students who initially do not meet university admissions criteria. Many two-year college students are the first generation of college participants in their families and therefore do not have the support network and traditions of students who come from a long line of college attenders. Therefore, one recommendation is that further persistence studies be completed on two-year college transfer students as a group in and of themselves, so that their particular and perhaps unique qualities and characteristics can be identified and validated.

The failure of the present study to discover more than one significant predictor, and the lack of correlation among and between variables, may indicate that the chosen variables under-represent the complexity of factors undergirding transfer students’ persistence and success at the four-year college. Tinto (1993) observed in his study of student departure that "researchers and policy analysts have generally overestimated the extent of student departure from higher education and thereby also underestimated the
degree to which individuals enter and eventually complete their higher education degree programs’ (p.22). He further observed that the racial, social, and intellectual diversity characteristic of college students, and their varied uses for college across a number of time lines, combine to make very difficult the analysis of factors affecting entry, persistence, and departure from college (p.14). Therefore a second recommendation for the clear need for additional research into transfer student persistence and success is for researchers to employ complex statistical procedures on longitudinal data. Methods such as path analysis, also called structural equation modeling (employed by Johnson, 1987, Kraemer, 1995, and Cabrera, Nora, & Castaneda, e.g.), and applications of regression analysis such as those developed and employed by Astin (1991) are powerful tools which provide the means to discover complex interactions among and between variables. For his book What Matters In College?: Four Critical Years Revisited (1993), Astin used 82 regression analyses to describe relationships on over 140 entering student characteristics and 190 environmental characteristics.

Community and junior colleges will have no choice but to continue to examine their role in providing initial opportunities for students to attend college. However, they must also continue to evaluate the success of their transfer function. Augustine Gallego, Chair of the American Association of Community Colleges Board of Directors, contends that with the recent legal decisions in California and Texas which prohibit affirmative action in college admissions, two-year colleges have yet another compelling political and social reason to strengthen and evaluate their transfer purpose.
Four-year and upper division receiving institutions should also continue to study their transfer students and the overall climate and environment into which these students come. The results of the present study, and others mentioned above, suggest that transfer GPA is a reliable predictor of university GPA. But retention appears to be a phenomenon that is dependent on a wide variety of factors, including demographic, environmental, social, personal, financial, and academic criteria. University and two-year college administrators should collaborate to create transfer agreements that will minimize or eliminate loss of credits upon transfer. Dupraw and Michael (1995) found that the Transfer Admission Guarantee program established between the University of California at San Diego and the San Diego Community College District tended to promote success and persistence of students transferring under its auspices. And in Texas, the creation of the Common Course Numbering System has facilitated transfer of credits and reduced the number of questions and disputes which can arise with transcript evaluation. It is recommended that common course numbering be extended to account for literally every course which is approved for Texas two-year schools to offer and which has a counterpart at state four-year or upper division institutions.
APPENDIX A

DATA QUERY LETTER
Dr. Virginia E. Wheeless
Associate Vice President for Planning &
Special Assistant to the Chancellor
Office of University Planning
University of North Texas
Denton, TX  76203

Dear Dr. Wheeless,

I am a doctoral student in Higher Education at The University of North Texas, Dr. Howard Smith is my major professor. I am currently preparing my dissertation proposal and am “ABD.” In real life I teach English and am director of the Arts and Sciences Division at Navarro College in Corsicana.

The study I am proposing would examine community college transfer student success at UNT. I am interested in looking at selected community college student academic experiences as predictors of persistence and success at North Texas. Therefore, I would need to inspect both transfer transcripts and UNT transcripts of students selected for the sample. That need prompts this letter to you.

I have been advised that my questions of how I might acquire transcripts, or whether they might be available at all, should be directed to you rather than to the Registrar’s Office. So, I would like to ask those questions, and others, at your convenience. I will call in a few days to arrange an appointment, or if I am slow, perhaps your secretary could advise me on open dates in your schedule.

Thank you for your consideration.

Regards,

Mark Underwood
APPENDIX B

E-MAIL CONFIRMATION
Your letter to Dr. Wheeless has been referred to me for response. I will be glad to assist you with your dissertation data needs. Please send me your FAX number and I will provide you with an outline of what will be required to obtain student record data for your research needs. I will be glad to meet with you and discuss your goals and objectives before you identify specific data elements if it would be of help to you in understanding what we have available versus what you need.

I am extremely interested in your project as I am also a doctoral student in higher education but lacking two courses before I take the qualifying exams and begin dissertation. My topic, hopefully to be approved, deals with the retention of at risk students (both new from high school and transfers).

Joneel Harris
Registrar
IN:HARRISJ@UNT.EDU
NOTE: By including the IN: your e-mail should come directly to my GroupWise in box rather than my Pegasus internet box where most list serve mail is received.

FAX 817-565-4463
PH 817-565-2748
REFERENCES


