ABSTRACT

Title of Thesis:	FACTORS AFFECTING UNIVERSITY GPA OF MARYLAND COMMUNITY COLLEGE TRANSFER STUDENTS WHO PERSIST TO GRADUATION
	Sarah Elizabeth Hall, Master of Arts, 2005
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This study examined Maryland community college transfer students who persist to graduation. Personal characteristics, academic qualifications, and major were examined to determine if any of these factors were predictors of university GPA. These characteristics were: age, race, gender, community college, transfer GPA, first semester GPA, accepted transfer credits, completion of freshmen fundamental studies, Associates degree completion, and college of major. The sample consisted of 530 subjects.

The data analysis revealed significant results. Age, race, gender, transfer GPA, first semester GPA, and college of major were all significant predictors of variance in cumulative GPA for community college transfer students. Women, White subjects, and College of Education graduates were significantly more likely to earn higher cumulative GPAs than other subjects within each of these variables. University GPA was significantly correlated with age, transfer GPA, and first semester GPA. These findings have practical implications for admissions and student support services at four-year institutions.

FACTORS AFFECTING UNIVERSITY GPA OF MARYLAND COMMUNITY
COLLEGE TRANSFER STUDENTS WHO PERSIST TO GRADUATION

By

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Table of Contents

List of Tables

Chapter 1: Introduction

Introduction

Community college students constitute an increasingly significant percentage of students in higher education (Lanaan, 2001). From 1975 to 2001 the percentage of higher education students enrolled in community colleges increased from 35% to 40% (National Center for Education Statistics, 1995, 2003). The number of community college students who intend to transfer continues to rise (Cejda, Kaylor & Rewey, 1998). For many groups who have been historically underrepresented in four-year institutions such as racial/ethnic minorities, low-income and nontraditional students, the community college serves as an educational gateway (Berger & Malaney, 2003).

Community colleges need to be aware of how to best serve their students who intend to transfer. With an increased focus on retention and graduation rates, especially for students of color, four-year institutions need to be better informed about their community college transfer students and their persistence to graduation. A number of studies have examined the relationship between transfer students' academic and social integration factors at four-year institutions and their graduation rates (Berger & Malaney, 2003; Cedja, 1994; Rhine, Milligan & Nelson, 2000). This information is useful in assessing community college transfer student success after they transfer. However, these studies are not useful to admissions staff when they attempt to gauge the likelihood of success for a community college transfer applicant.

With the increasing population of community college transfer students, the success of these transfer students may become increasingly important to four-year

institutions. An increase in articulation agreements is intended to facilitate transfer between community colleges and four-year institutions (Robertson & Frier, 1996). Strengthening these ties has the potential to improve the transfer pipeline and increase transfer rates. These collaborative efforts between four-year universities and community colleges could impact the academic success of transfer students. Many articulation agreements, such as the Maryland Higher Education Commission, mandate acceptance of a transfer student after they earn their Associates degree (Maryland Higher Education Commission, 2003). With the mandate to accept these students, universities need to be aware of factors that cause attrition. If students possess "at-risk" qualities, universities must examine what they can do to support these students in order to improve persistence to graduation.

<center>Problem Statement</center>

The purpose of this study was to identify characteristics of community college transfer students that are predictors of university grade point average (GPA) by examining variables in three categories: personal characteristics, academic qualifications, and majors. The primary research question is:

1. Which variables, if any, are predictors of the variance in GPA for community college transfer students who persist to graduation?

The secondary research question is:

2. Does university GPA differ significantly by race, age, gender, community college, community college GPA, first semester GPA, number of community college transfer credits, completion of freshmen fundamental studies, Associates degree completion, or major?

<center>2</center>

Background

Most literature on student departure examines four-year university students and most research on college students focuses on the four-year university (Maddox, 1998). For example, *How College Affects Students* by Pascarella and Terenzini (1991) is a commonly referenced book in the sphere of higher education. Pascarella and Terenzini admit that fewer than five percent of the studies reviewed for this book examined community college students. They suggest that a more appropriate title would be "How Four-Year Colleges Affect Students" (Pascarella & Terenzini, 1991, p. 155).

Leaving College: Rethinking the Causes and Cures of Student Attrition features Tinto's (1987) longitudinal model of institutional departure. This model focuses on traditional-aged students who begin their college education at a four-year institution. Tinto addresses departure from two-year institutions, stating that academic, rather than social issues influence them more. Once again, these unique populations of students who succeed at the community college and then transfer to four-year institutions are not examined. Departure rates for community college students can be deceiving since some students leave to transfer to a four-year institution. Tinto mentions that "It should also be observed that departure from two-year college also reflects the fact that two-year college students are, on the average, academically less able or less well prepared to meet the academic demands of college work" (p. 80).

With the emphasis on students who depart from college, we are neglecting the population who successfully make the transition to four-year institutions. As

mentioned earlier, Tinto (1987) asserts that departure for community college students is influenced more by academic rather than social issues. On the assumption that the converse holds true as well, academic factors influence student persistence. Community college transfer students bring a unique set of characteristics to their four-year universities. Characteristics of successful transfer students need to be examined further to define this unique population of students.

With increasing tuition costs at four-year institutions, higher education officials anticipate that enrollment at community colleges will continue to increase, serving as an affordable alternative for the first two years of higher education (Graham & Hughes, 1994). With an increasing number of first-year students enrolling at community colleges, universities should be conscious of their community college transfer student rates. They must recognize that this can be a valuable population that contributes to the diversity and finances of the institution.

Community colleges serve an important purpose. For many groups that have been historically underrepresented in four-year institutions such as racial/ethnic minorities, low-income and nontraditional students, the community college serves as an educational gateway (Berger & Malaney, 2003). Open-access admissions allows students who may not be eligible for admission to four-year institutions the opportunity to pursue postsecondary education (Laanan, 2001). African-Americans and Hispanics are over-represented in many public community colleges, because they are under-represented at four-year universities and use community colleges as their point of access (Cohen, 1994; Suerez, 2004). Out of all the first year students at community colleges, 80% enter with the intention of transferring to a four-year

institution (Cejda, 1997). The number of students who intend to transfer continues to rise (Cejda, Kaylor & Rewey, 1998). Although many argue that community colleges increase access to higher education, others criticize the quality of education (Brint & Karabel, 1989).

To be accepted to a four-year institution, students must have been successful at their community colleges. Transfer rates don't tell us anything about student success and failure after students transfer. Admission of community college transfer students is often based on space availability at four-year institutions. Filling empty seats is a source of revenue for universities. Studies show that there is no significant difference in post-degree stability of employment, job satisfaction, job prestige and earnings when comparing students who began at community colleges and students who began at four-year universities (Pascarella, 1999). Universities should have a vested interest in this growing population of students because in the future they will be just as successful as native students. If transfer students have a positive experience and a sense of institutional commitment, it could enhance the university's reputation, and generate alumni donations.

It is important for four-year institutions to understand how students from community colleges fare once they enter their institutions and what characteristics of transfer students contribute to their success. This kind of knowledge has implications for admissions criteria and for the design of interventions that would support transfer students and guarantee their persistence toward a four-year degree.

Definition of Key Terms

Standard definitions for all constructs used in this study were defined prior to the commencement of this analysis. Definitions were established based on prior literature and classifications used by the University of Maryland.

Community College: An institution that is regionally accredited to award the Associates degree as its highest degree (Cohen & Brawer, 2003). This study will only include students from Maryland Community Colleges.

Community College Transfer Students: Students who begin their postsecondary education at a community college and transfer to four-year institutions. The University of Maryland Office of Admissions classifies incoming students as two-year transfer students if they completed 12 credit hours at a two-year institution with no prior enrollment at a four-year institution.

Native Students: A term commonly used in reference to students who began their post-secondary education at that institution

Persistence to Graduation: Completing all the requirements for a Bachelor's degree.

Freshmen Fundamental Studies: Freshmen fundamental studies are comprised of the fundamental math and fundamental English requirements of the University of Maryland. The University of Maryland Undergraduate Catalog (2004) outlines these requirements. The English requirement is completed by SAT exemption (670), AP credit (score of 4 or 5 on English Language and Composition), or completion of an "Introduction to Writing" course (p. 50). The math requirement is satisfied by SAT Exemption (600), AP credit (score of 4 or 5 on Calculus or Statistics), or completion

of a 100-level math course such as "Fundamental Math Models," "Precalculus," or "College Algebra" (p. 50).

Race: The race classifications were determined by the University of Maryland admissions application, defined by the Office of Institutional Research. Six options are provided: American Indian/Alaskan Native, Black or African-American, Asian or Pacific Islander, Hispanic, White, and Other or Not Reported. These classifications are based on the Standards for the Classification of Federal Data on Race and Ethnicity determined by the Office of Management and Budget in The Executive Office of the President. Although revised in 1997, University of Maryland still uses the classifications prior to the revision (Office of Management and Budget, 1997).

Age: The number of years the subject has lived as of September 1st, 1997.

Major: The academic program in which the student completes all degree requirements and earns a Bachelor's degree.

Summary

Community college transfer students are an important student population that is often neglected in statistics. Much of the research on academic success focuses on four-year institutions and their first-time freshmen. Community college transfer students are gaining notice as articulation agreements are established and the transfer process is improved. We must increase our awareness and understanding of the growing community college population.

To better understand the characteristics of transfer students that ensure their success, I will examine a cohort of students who entered the University of Maryland in fall 1997 and spring 1998 to determine to what degree, academic, personal

characteristics, and college of major contribute to persistence and success. The

following chapter reviews literature on community college transfer students related to

the research questions of this study.

Chapter 2: Literature Review

Introduction

This chapter reviews the evolution of the community college, the community college transfer student population, and prior research that has examined the academic success of transfer students. Previous research has studied the personal characteristics, academic qualifications, and college of major from different aspects within the context of academic success of community college transfer students. Most literature on community college students has examined this population within the context of their transfer experience, preparation for four-year universities, and success and failure at four-year universities. The broad diversity of community college transfer students makes it difficult to draw conclusions and create generalizations about their characteristics and needs.

Community College History

The junior college concept was originated by elite university administrators, with hopes that these institutions would help divert some of the growing number of students interested in higher education applying to their institutions (Brint & Karabel, 1989). Administrators feared that without other higher education alternatives they would have under-prepared students demanding access to their institutions. The transfer program was the initial curriculum offered at junior colleges when they were created in the early 1900s. In the 1940s and 50s, approximately 65% of two-year college students transferred to universities (Monroe, 1972). When the colleges began to grow and recognized the need to provide access and opportunity to people of

diverse backgrounds, more functions were added to the mission of the junior college, including non-degree occupational programs and post-high school terminal programs (Rendon & Nora, 1994; Brint & Karabel, 1989). After World War II junior colleges became community colleges, with added functions of community services and remedial studies (Lee, Mackie-Lee & Marks, 1993). In the 1960s the number of community colleges in the U.S. exploded, with the opening of 457 community colleges (American Association of Community Colleges, n.d.), which doubled the number of community colleges in the country. At this point the number of students who transferred to universities began to decline. By 1973 the transfer rate decreased to 43% and by 1980 it had dropped to 30% (Rendon & Nora, 1994).

Although some are critical of this decrease in transfer rate (Brint & Karabel, 1989), others may argue that this simply reflects the expanded mission of the community college. Common curricular functions of a community college include academic transfer preparation, vocational-technical education, continuing education, development education, and community service (Cohen & Brawer, 2003). Academic transfer, the function that facilitates transfer to a four-year institution, is a fifth of the curricular elements. Not all students attend community college for the sole purpose of preparing for four-year institutions. This is not a failure for the community college since transfer preparation is only a portion of their mission.

While many applaud the community colleges for improving access for students, some researchers have made observations critical in nature. According to Brint and Karabel (1989), "The very fact of attending a two-year rather than a four-year institution lowers the likelihood that student will obtain a Bachelor's degree" (p.

10

227). In *The Diverted Dream,* authors Brint and Karabel suggest that community colleges manage ambition and divert students from four-year institutions. Often touted as a gateway to higher education, Brint and Karabel argue that the community college decreases students likelihood of earning Bachelors' degrees. However, others contend that if it weren't for community colleges, many of these students wouldn't be in post-secondary education at all (Cohen & Brawer, 2003).

In the past 20 years, there has been a nationwide trend in the development of articulation agreements between large state institutions and local community colleges (Rifkin, 2000; Solomon, 2001). The ultimate goal is to have a statewide articulation agreement between the public universities and colleges. This plan takes time to implement because community colleges and universities need to come to agreement on transferable courses. The curriculum must be approved to ensure that community colleges adequately prepare students for four-year institutions. According to a Ford Foundation survey, all 50 states have some type of higher education coordinating association (Robertson & Frier, 1996). Some of these agencies have the power to direct transfer activities or fund special services for transfer students. Others mandate or recommend that colleges collect data on transfer students. Community colleges continue to grow and change. With enrollment saturation and rising tuition, community colleges may become more selective in admissions and eliminate accessibility for the less privileged.

<center>Future of Community Colleges</center>

Since their evolution in the 1970s, community colleges have grown in size and complexity. According to Cohen and Brawer (2003), the number of community

<center>11</center>

colleges has remained steady in recent years and is not expected to change. Nonetheless, attendance at these colleges is likely to increase. In 2009, the number of 18-year-olds in the United States is expected to peak. In combination with an anticipated decrease in school dropouts, the proportion of African-American and Hispanic college graduates is expected to increase. Since community colleges serve as an access point, particularly for students of color, this suggests that there many be an increase in enrollment. There is also an anticipated increase in students because of high increases in four-year tuition rates. Community colleges offer an affordable alternative. Coupled with an increase in college curriculum at two-year institutions, an increase in community college attendance is likely.

Community College Transfer Students

The community college transfer student population is diverse. White students comprise 67% of community college enrollment nationwide (National Center for Education Statistics, 2001). However, community colleges often reflect the ethnic composition of their surrounding communities. In 1997, 46% of ethnic minority students in higher education were enrolled at community colleges (National Center for Education Statistics). Community colleges also serve nontraditional students such as working adults and returning students. In the late 1990s, studies indicated that the mean age of community college students was 29, the median 25, and the mode was 19 (National Center for Education Statistics). This reflects a bifurcation in this student population. The mode age of 19-years-old represents the traditional aged students who enter community college immediately following high school. The mean and median ages of 29 and 25 correspond to the working adults who are returning to

higher education. The average age of transfer students varies from study to study. In her study at a large university in North Carolina, Frederickson (1998) found the average transfer student to be a White, 26-year-old woman. Lannan (1999) found that over one-third of community college transfer students to a large Research I institution in California were over the age of 25. Half of the students were White while the other half were students of color, predominantly Asian.

The responsibility for low transfer rates is sometimes attributed to community colleges (Dougherty, 1992). Approximately 30 to 40% of community college entrants aspire to earn a baccalaureate degree (McCormick & Carroll, 1997). On average, 70% of four-year college entrants earn a Bachelor's degree, while only 26% of community college entrants earn Bachelor's degrees (Velez, 1987). Many community college students possess characteristics that are associated with lower rates of baccalaureate attainment including: low-income, racial and ethnic minorities, less academically prepared, and part-time status (Astin, 1975; Tinto, 1987). However, Dougherty states that even when these factors are controlled for in a comparison, entering community college students receive 10 to 11% fewer Bachelor's degrees than students who begin their higher education at four-year universities.

It is important to remember that community college transfer students who graduate are a very small population. Incoming community college students have less than a 50% chance of transferring to four-year institutions. According to some researchers, when students do transfer there is less than a 50% chance that they will graduate (Dougherty, 1987; Pincus & DeCamp, 1989; Rendon & Matthews, 1989).

Community college transfer students face a number of obstacles when they transfer to four-year institutions. Environments at community colleges and four-year institutions are very different. Class sizes, student demographics, level of difficulty, and relationships with faculty are just a few examples of changes to which transfer students need to adjust. Community college transfer students are stereotyped as "risky ventures" at some institutions (Diaz, 1992).

However, in general, graduation rates of transfer students have been found to be similar to that of students who begin as first year students at four-year institutions. McCormick and Carroll (1997) studied a nationwide cross-section of students and found a 70% persistence rate for students who transferred from community colleges to four-year institutions. This is comparable to the persistence rate of students who began at four-year institutions. In Glass and Harrington's (2002) study that compared academic performance of community college transfer students and native students, they found no significant difference in the graduation rates between the two groups. However, they did find that it took many of the transfer students an additional semester to graduate. Pascarella (1999) reports that first year community college students with intentions to earn a Bachelor's degree are 15% less likely to do so in the same period of time as their counterparts that begin at four-year institutions. Therefore, the statistic that native students and community college transfer students have similar graduation rates can be deceiving.

Academic qualifications related to University GPA

There have been a number of studies related to the academic factors associated with success of community college transfer students. Community college

14

GPA, first semester GPA, community college transfer credits, completion of freshmen fundamental studies, and Associates degree completion are the characteristics that will be considered in this study.

Community College GPA

One of the most common factors included in the study of community college transfer student success is the student's GPA at the community college. There are five recent studies that are most frequently cited when referencing community college GPA in association with university GPA. All five studies found that community college GPA had a strong relationship to academic success at the four-year university.

Carlan and Byxbe (2000) compared upper-division performance of a group of community college transfer students and a group of junior native students. Both groups were primarily White and female but differed in age. The community college transfer student sample was significantly older, with 55% of the group 25-years-old or greater while only 15% of the native students had reached 25-years of age. For transfer students, lower-division GPA from their community college was the strongest predictor of upper division GPA (27%). For native students lower division GPA accounted for much less of the variance in upper-division GPA (five percent). A regression analysis found little variation between upper-division GPAs when holding constant related variables.

Saupe and Long (1996) at the University of Missouri-Columbia were interested in the admission standards of transfer students, suggesting that these standards needed to be strengthened. To gain a better understanding of factors that contribute to persistence and graduation, they investigated the relationship between

numerous variables (i.e., number of transfer credits, transfer GPA, type of previous institution, and type of Associates degree earned) and the outcomes of academic persistence and graduation rates. Multiple regression indicated that transfer GPA was the most significant predictor of persistence (13%) and graduation (21%). A limitation of this study was the statistical methods. Multiple regression was used with a categorical dependent variable. The authors recognized this problem and also used logistic regression, and mentioned that the logistic correlations were similar to the standard regression models. However, details of this logistic regression were not included in the article.

Graham and Hughes (1994) studied 267 transfer students at a large, research university. They found the students' expected GPAs, transfer GPAs, and receipt of Associates degrees accounted for 20 to 33% of the variance in GPA for the first three semesters at the four-year university. They first conducted an ANOVA to identify relationships between GPA and variables in three groups: academic background, student background, academic and environmental support variables, and educational aspirations and goal commitment. The five variables that indicated consistent patterns of association were then used in a regression analysis. These variables were: receipt of an Associates degree, transfer GPA, intended place of residence, expected GPA, and the frequency of requests for out-of-class help from the community college faculty.

Townsend, McNery and Arnold (1993) studied academic performance of students who transferred from a community college to a private university. The researchers reported that community college GPA was found to be the best predictor

of academic success at the university (degree persistence and completion). Three categories of independent variables were examined: general characteristics, pre-transfer variables and university characteristics. General characteristics included gender, ethnicity, age, ACT or SAT score, high school GPA, and high school class rank. Pre-transfer variables were program of study, total credit hours earned at the community college, cumulative GPA, and Associates degree status. Finally, the university characteristics of program of study upon entrance, first-term GPA, cumulative GPA, and persistence were also examined. There are limitations in the methods of this study. The author implies a causation effect. However, because they used Pearson's correlation coefficient, only a relationship between variables can be concluded. White students comprised 92% of the sample population with a majority of female students (58%), which may hinder the generalizability of these results to a broader and more diverse population.

Piland's (1995) study of *Community College Transfer Students Who Earn Bachelor's Degrees* reviews successful community college transfer students by examining their academic backgrounds and attendance patterns. The most relevant finding was the strong relationship identified between transfer GPA and graduation rates. From 1987 to 2002, 15,085 community college transfer students enrolled at San Diego State University. In 1993, 5532 students earned a Bachelor's degree from San Diego State University. Of these graduates, 1796 were transfer students from eight different San Diego County community colleges. Selected in a random sample, 300 of the 1796 students were analyzed in detail. Descriptive statistics of the 15,085 transfer students were also presented. The perceived limitations surrounding methodology

may be unfounded if the analyses and full results had been reported. It was unclear

what statistical analyses were conducted for this study. Only one significant

correlation is referenced. The absence of detail regarding other correlations that may

have been insignificant makes it difficult to form broader conclusions from this study.

The unanimous conclusion of all of these studies is that community college

GPA is significantly related to academic success (persistence and graduation) at the

four-year university. Methodology, including statistical procedure, is the main

limitation in a number of the studies.

First Semester GPA at Four-Year University

Transfer shock is characterized as a temporary dip in transfer students

academic performance in the first or second semester after they transfer (Hills, 1965).

A term coined by John Hills in his 1965 article that examined this phenomenon,

transfer shock has been the focus of numerous studies involving community college

transfer students. Diaz (1992) analyzed 62 studies on transfer shock that examined the

extent of change in GPA. In 79% of the studies the GPA was negatively impacted,

however the change was usually half of a grade point or less. Of these studies that

showed a negative effect on GPA, 67% showed that students recovered from transfer

shock within the first year after they transferred. Graham and Dallam (1986)

compared transfer students from community colleges and four-year institutions with

native students, and found that both groups of transfer students were more likely to be

placed on academic probation. Glass and Harrington (2002) studied 100 students in

the University of North Carolina system, half of whom had transferred from the North

Carolina Community College System. They found that initially transfer shock occurs, but GPAs equal out by the time of graduation.

A variation on the typical study of transfer shock, Cejda (1997) studied the affect of transfer shock by discipline. The sample consists of 100 students who transferred to a small, private liberal arts college and enrolled full-time after completing a minimum of 24 semester credit hours at a community college. Results found that the transfer shock experienced by the whole sample did not accurately reflect the variations by major. Students transferring into business, math and sciences experienced a significantly greater amount of transfer shock when compared to the average decline of the entire sample. Cedja also found that students in education, fine arts and humanities, and social sciences had a slight increase in the post-transfer GPA. An increase in post-transfer GPA has been labeled transfer ecstasy (Laanan, 2001). Cejda argues that although many studies report evidence of transfer shock, the statistical significance in decline of GPA is not measured. Cejda proposes that more studies need to examine post transfer increase and decline in GPA by academic discipline and statistical significance.

Although transfer shock has been repeatedly studied, studies do not investigate if a relationship exists between severity of transfer shock and academic success. An association between first semester GPA and cumulative university GPA has not been examined.

Community College Transfer Credits

Studies of the significance of the number of community college transfer credits in university academic success provide conflicting results. Best and Gehring

(1993) reported on the academic performance of community college transfer students at a large Kentucky university. The main hypothesis was that community college transfer students with more than 60 transfer credits would have higher GPAs, graduation rates, and dismissal rates than students who transferred with fewer than 60 credits. The results indicated that community college students who transfer after 60 credits have higher mean GPAs, graduation rates, and lower dismissal rates than students who transferred with fewer than 60 credits.

A number of studies previously reviewed examined the influence of the number of credits transferred on various variables. Carlan and Byxbe (2000) found that number of credits transferred from the community college did not predict a significant amount of variance in upper-division GPA. Saupe and Long (1996) discovered the contrary, finding a correlation with number of credits transferred and persistence to graduation. McCormick and Carroll (1997) reported that among community college transfer students, students who completed an Associates degree prior to transferring were more likely to earn a Bachelor's degree.

Completion of Freshmen Fundamental Studies

Fundamental studies have different meanings at different universities. Degree requirements vary based on the college and major, however most institutions have some type of basic requirements that students must fulfill, regardless of major. In a study of 361 community college students who transferred to a university, Phlegar, Andrew and McLaughlin (1981) found that students who had met the curriculum requirements of math, English and science prior to transferring earned higher GPAs at the university. This factor was found to be insignificant in a study by Hughes and

Graham (1992), which found that class attendance at the community college was the only significant variable in students who received satisfactory GPAs at the university.

Math and English requirements are a core staple of curriculum throughout elementary, secondary, and post-secondary education. If community college students have not completed these basic requirements at their community colleges, this may be an indication of a students' academic ability to succeed academically.

Associates Degree Completion

Associates degree completion rates for community college transfer students vary by institution. Nationally, 35% of community college transfer students earn an Associates degree prior to transferring (National Center for Education Statistics, 1997). Earning an Associates degree prior to transfer may have a number of implications. With transfer articulation agreements, an Associates degree allows students to focus more on upper-division major coursework since lower division coursework may satisfy general education requirements.

The Graham and Hughes (1994) study reviewed earlier found that students who earned an Associates degree before transferring to a four-year institution were more likely to receive higher grades at the university level. Best and Gehring (1993) had similar findings, students who transferred with 60 credits or more (junior standing) performed better at the university level than lower division transfer students. Junior transfers received higher GPAs, had higher graduation rates and lower dismissal rates. However, Carlan and Byxbe (2000) found no relationship between Associates degree completion and upper-division GPA. McCormick and Carroll (1997) reported that amongst community college transfer students, 43% of

21

those who completed an Associates degree earned a Bachelor's degree compared to 17% of those who transferred prior to earning a Bachelor's degree.

Personal Characteristics and University GPA

Race, age, gender, and community college are personal characteristics that remain consistent throughout a student's college experience. Although these factors would certainly not impede students' chances of admission to a four-year institution, they may influence the likelihood of success after transfer. Studies analyzing the relationship between these characteristics and academic performance produce conflicting results.

Race

Studies produce drastically different results regarding transfer students and race. Upon closer examination, many studies use samples that contain very small numbers of students of color. This may reflect the demographics of the particular community colleges studied, or the low number of students of color who transfer to four-year institutions. According to Cohen's (1995) study of minority student transfer rates, Latino students transferred at a rate of 12.4%, Black students at 12.5%, White students at 23.4%, and Asian students at 23.6%, and Although large numbers of Latino and Black students may be attending community colleges, they are not transferring at the same rates as White and Asian students.

In Carlan and Byxbe's (2000) study at a large university in the southern United States, the transfer student sample of 487 students was comprised of 438 Whites and 49 Blacks. The sample of 230 native students consisted of 171 Whites and 59 Blacks. Although Carlan and Byxbe found that race accounted for less than

one percent of variance in upper division GPA for CC transfer students, Whites earned almost 25% of a letter grade more than Blacks. Black students were the only students of color in the sample so these findings in terms of race are not generalizable to other racial and ethnic minorities.

Piland's (1995) analysis of a 300-student sample of community college transfer students was from a population that consisted of one-third minority students. The data analysis examined individual ethnic groups and graduation rates. Native Americans, Caucasians, and Hispanics graduated the fastest while Caucasians, Hispanics and Asians had the highest gradation rates over time. African Americans and Pacific Islanders had the lowest graduation rates. Piland mentions there were an extremely small number of students within some of the ethnic groups. However, no details were provided regarding the exact breakdown of the sample by race and ethnicity. It is difficult to draw conclusions on the statistical significance of the calculated data.

Graham and Hughes (1994) found no relationship between race and variance in GPA for community college transfer students in their study. However, of the 267 students in the sample, 94% were Caucasian. With only 17 students of color, data analysis using race as a variable would have little significance.

Age

Many people view community college students as nontraditional in age citing Arthur Cohen, a reputable community college researcher, with his statement that the average community college student is 29-years-old (Adelman, 2003). With an emphasis on serving these older students, Adelman points out that we are ignoring the

rapidly changing community college population. Adelman's article, "A Growing Plurality," discusses the increasingly dichotomous nature of the community college transfer student population. In 1999, 42% of enrolled community college students in the United States (Adelman, 2003) were under the age of 22-years-old. This reflects the growing population of traditional aged students who enter immediately after high school in conjunction with the returning adult students.

Lannaan's study focuses primarily on age, while other studies consider age as a potential factor in the prediction of academic success. Laanan (1999) examined the impact of age on the outcome of community college transfer students experience at a California research I university. The sample was comprised of 275 older (25-years-old and higher) and 442 younger (24-years-old and below) liberal arts students. They completed a Transfer Student Questionnaire (TSQ) which was organized into three sections: social demographics, community college experiences, and university experiences. There were significant findings relevant to university GPA. At the community college, younger and older students had similar GPAs. At the university, older students had significantly higher GPAs, indicating that age is positively correlated with university GPA.

Carlan and Byxbe (2000) found that age accounted for one percent of the variance in upper division GPA for community college transfer students. However, Graham and Hughes (1994) found no relationship between age and university GPA for community college transfer students.

Gender

The literature provides conflicting data regarding the impact of gender on academic performance. An unusual analysis of community college transfer students, Surette (2001) examines gender differences in community college transfer students from an economic perspective, concerned about long-term wage earning potential. This study reveals a lot regarding the success of female transfer students. The most relevant finding in this study is that women who transfer from a community college to four-year institution are less likely than men to earn a Bachelor's degree. Surette asserts that women are less likely to transfer from two-year to four-year institutions and subsequently less likely to complete a Bachelor's degree. The author controlled for marital status, presence of children, and gender differences in occupational preferences but this still did not fully explain women's lower transfer rates. Limitations of this data include the ambiguity regarding data collection and analysis. The data was collected from 1979 through 1990. Although this article was published in 2001, it is important to be cognizant of the age of this data.

Other studies found no relationship between gender and GPA. In a study by Carlan and Byxbe (2000) comparing native and transfer student performance in upper-division coursework, gender was not a significant predictor of upper division GPA. Graham and Hughes (1994) also found no relationship between gender and GPA for community college transfer students.

Majors

Community college transfer students have a wide range of majors to choose from. Some students transfer as undecided while others transfer with specific degree

25

intentions. Carlan and Byxbe (2000) studied 487 transfer students at a large southern U.S. university, and found that college of major predicted 10% of the variance for upper division GPA. Business and science majors had the worst GPAs while education and psychology students had the best GPA. Piland (1995) studied a group of 15,085 community college transfer students who transferred over a six-year period. He compared characteristics of this sample with those of 1,796 community college transfer students who graduated from San Diego State University in 1994. Piland found that community college transfer students who entered the four-year institution without a declared major were less likely to earn a degree than those students who transferred with a declared major.

Summary

The relationship of various characteristics to academic performance of community college transfer students is inconclusive. It is challenging to create conclusions about the academic success of community college transfer students due to conflicting findings and variations of research methods. The most consistent finding is that community college GPA has an impact on a student's university GPA and persistence to graduation. Other factors in GPA variance vary by study, and may be influenced by the characteristics of the sample population.

Many studies commonly referenced in the literature use samples from the 70s and 80s. There are few studies using data from the past five years. Several large-scale studies of community college transfer students are based on cohorts from the late 1970s and early 1980s with a number studies using data from the National Longitudinal Study of the Class of 1972 (Adelman, 1992; Dougherty, 1992; Grubb,

1991; Kinnick & Kempner, 1988; Lee, Mackie-Lewis & Marks, 1993; Pascarella, Smart & Ethington, 1986). The demographics and number of students in higher education has changed significantly in the past 20 years. Data and conclusions from these outdated studies may no longer be representative of today's student population. More studies on recent student populations are needed to determine if the findings still the same. Other studies often use sample populations with a very small proportion of racial and ethnic minorities.

The large research I institution in the mid-Atlantic region used in this study provides a pool of diverse community college transfer students. Many studies examine correlations between student characteristics and university GPA or likelihood of graduation. Fewer studies examine these variables to determine predictors of variance in university GPA. University GPA can determine if a student remains in good academic standing and impact post-graduation opportunities (jobs and graduate school). Educators must learn more about this growing student population as contributors to our higher education institutions. The next chapter provides an overview of the study methods and procedures.

Chapter 3: Methodology

Research Design

The purpose of this study was to identify characteristics of community college transfer students at University of Maryland that are predictors of university GPA for students who persist to graduation. Variables in three categories were examined: personal characteristics, academic qualifications and major. Personal characteristic variables were: race, age, gender and community college. Academic qualifications variables included: community college GPA, first semester GPA at four-year institution, number of credits transferred, and completion of freshmen fundamental studies. The final variable was college of major of the Bachelor's degree granted. For the purpose of this study, significance was measured at $p < .05$.

The primary research question was:

> 1. Which variables, if any, are predictors of the variance in university GPA for community college transfer students who persist to graduation?

Two secondary questions were:

> 2. Does university GPA differ significantly within the categorical independent variables used in this study?

> 3. Is there a relationship between university GPA and the continuous independent variables?

Hypotheses

The following null hypotheses were proposed:

Hypotheses 1: There are no significant predictors of university GPA for

community college transfer students.

Hypotheses 2: There are no significant differences in university GPA among any of

the categorical independent variables.

Hypotheses 3: There is no relationship between university GPA and any of the

continuous independent variables.

Variables

The continuous dependent variable was university GPA. This GPA was the

cumulative GPA for all coursework completed at the University of Maryland. The

University of Maryland's GPA is on a 4.0 scale. An "A" average is a 4.0, "B" average

3.0, "C" average a 2.0 and a "D" average is a 1.0. The University of Maryland does

not include the grade point average from coursework at other intuitions.

The independent variables (Table 3.1) were grouped as personal, academic,

and major. The personal characteristics were race, age, gender and community

college. These variables were considered personal variables because they describe the

subject. Although the community college attended was the choice of the subject, it

usually reflects the subjects county of origin, thus it was a demographic variable and

personal characteristic. Race was categorized as American Indian/Alaskan Native,

Black or African-American, Asian or Pacific Islander, Hispanic, White, and Other or

Not Reported. Age was a continuous variable, corresponding with the student's age in

years. Since the age was provided from the institution by birth date, this was

calculated to determine the age of the subject on September 1st, 1997.   Gender was

grouped by the categories male and female.

At the time of this study, there were 16 Maryland Community Colleges: Alleghany College of Maryland, Anne Arundel Community College, Baltimore City Community College, Carroll Community College, Community College of Baltimore County, Cecil Community College, College of Southern Maryland, Chesapeake Community College, Frederick Community College, Garret College, Hagerstown Community College, Harford Community College, Howard County Community College, Montgomery College, Prince George's Community College, and Wor-Wic Community College. The majority of transfer students were from three community colleges that are located within close proximity of the University of Maryland: Anne Arundel Community College, Prince George's Community College, and Montgomery College (Maryland Higher Education Commission, 2002). These three community colleges were in separate categories, while all the remaining community colleges were combined into one category for the data analysis.

The decision to limit the sample to transfer students from Maryland state community colleges was based on a number of reasons. The majority of community college transfer students are from the state of Maryland. Also, University of Maryland has worked with Maryland Higher Education Commission to develop a database of evaluations of the transferability of Maryland community college courses. Evaluation of out-of-state community college coursework may be less consistent due to the infrequency of transfer students from these institutions.

Academic Qualifications were: community college GPA, first semester GPA at four-year institution, number of credits transferred, completion of Associates degree, and completion of freshmen fundamental studies. Community college GPA

was the cumulative GPA from all community college coursework. First semester

GPA was based on the first semester of coursework at the University of Maryland.

Community college transfer credits was determined by the University of Maryland

Transfer Credit Center, which evaluates all transfer coursework.

Table 3.1

Independent Variables in the Data Analysis

Category	Categorization	Categorical or Continuous
Personal Characteristics		
Gender:	1) Male 2) Female	Categorical
Age:	16-60	Continuous
Race:	1) American Indian/Alaskan Native 2) Black or African-American 3) Asian or Pacific Islander 4) Hispanic 5) White 6) Other or Not Reported	Categorical
Community College:	1) Prince George's 2) Montgomery 3) Anne Arundel 4) Other	Categorical
Academic Characteristics		
Transfer Credits:	12-60	Continuous
Community College GPA:	0.5-4.0	Continuous
Fist Semester GPA:	0-4.0	Continuous
Associates Degree:	1) Yes 2) No	Categorical
Fundamental Studies:	1) Completed 2) Not Completed	Categorical
College		
	1) College of Behavioral and Social Sciences 2) Arts and Humanities 3) Education 4) School of Business 5) College of Math and Computer Sciences 6) Engineering 7) Life Sciences	Categorical

	8) College of Agriculture and Natural Resources
	9) School of Architecture Planning and Preservation
	10) College of Health and Human Performance
	11) College of Journalism
	12) Undergraduate Studies

Completion of freshmen fundamental studies was defined by the fundamental math and fundamental English requirements of the University of Maryland. These requirements were not analyzed independently, completion was measured as a dichotomous variable: both requirements completed or both requirements not completed.

The major variable consisted of one category, college of major for the Bachelor's degree earned at the University of Maryland. The 12 undergraduate colleges were: College of Behavioral and Social Sciences, Arts and Humanities, Education, School of Business, College of Math and Computer Sciences, Engineering, Life Sciences, College of Agriculture and Natural Resources, School of Architecture, Planning and Preservation, College of Health and Human Performance, the College of Journalism and Undergraduate Studies. The data for this variable was received by major, and it was then categorized by college.

<div align="center">Sample</div>

The 1997-1998 Maryland community college transfer cohort at University of Maryland consisted of 1633 students. In the academic year 2002-2003, five years after transfer, 957 of 1633 (58.6%) students had earned Bachelor's degrees (Maryland Higher Education Commission, 2002). The entire population of Maryland community

college transfer students who entered the University of Maryland in fall of 1997 and spring of 1998 was used in this study. This was a stratified sample that was limited to transfer students from community colleges within the state of Maryland.

Data Collection

The data was collected through the Office of Records and Registration. All data was downloaded into a file, identified by university identification number. Age, race, gender, community college, and Associates degree were demographics collected from students through the admissions application process. Age was provided in the form of an eight digit birth date. Age was determined by calculating the age of the subject on September 1, 1997. Number of transfer credits was based on the evaluation of the students' community college transcripts and the determination of accepted transfer credits, determined by the transfer credit center. Freshmen fundamental studies completion was determined through the evaluation of transfer courses and test scores. The transfer courses are evaluated by the transfer credit center and are either deemed equivalent to a course offered at the University of Maryland or determined to fulfill the fundamental math or English requirement even if there is no equivalent course. Data was provided separately for the completion of fundamental English and fundamental math. Subjects must have completed both requirements prior to transfer. Subjects that completed only one of the freshmen fundamental studies or neither requirements were all grouped into the same category of freshmen fundamental studies not completed. College of major was determined by the Bachelor's degrees granted upon graduation. In the data set, the major of each subject was provided. Each major was individually recoded into the college of the major. First semester

GPA was recorded in the database upon completion of the first semester. Cumulative university GPA was determined upon completion of all university degree requirements.

Analysis of Data

After data was collected from the Office of the Records and Registration, it was inputted into SPSS for data analysis. Significance was measured using $p < .05$.

Descriptive Statistics

First, descriptive statistics of the sample were generated. The characteristics of the sample by age, race, gender, community college, number of transfer credits, Associates degree completion, average community college GPA, average university GPA, completion of freshmen fundamental studies, and major of students was explained using frequencies and percentages. Measures of central tendency were reported for age to gain a better understanding of the age distribution.

Multicollinearity. An intercorrelation matrix was generated by SPSS to determine if any independent variables were highly intercorrelated. Multicollineraity violates the assumptions used in multiple regression. If the intercorrelation matrix reveals a strong correlation between any two independent variables, the independent variable with a lower correlation coefficient with the dependent variable will be removed from the multiple regression analysis.

If a strong correlation is detected between any two independent variables, a variance inflation factor for each predictor can also be calculated. This determines the degree to which collinearity among the predictors influences the precision of the

34

estimate. If any of the variance inflation factors are greater than ten, it is confirmed that this independent variable must be removed from the multiple regression analysis.

Inferential Statistics

For all statistical procedures, the dependent variable was university GPA. Since all students in the sample have earned a Bachelor's degree, they must have a GPA of 2.0 or higher. The dependent variable was on a scale from 2.0 to 4.0. The independent variables were categorical or continuous. Five variables were categorical: race, gender, college of major, completion of Associates degree, and community college. The remaining independent variables were continuous.

Multivariate Analysis. The primary research question was, "Which variables, if any, are predictors of the variance in GPA for community college transfer students who persist to graduation?" Hierarchical multiple regression was used to determine if any of the three groups of independent variables predict the variance in university GPA. Personal characteristics were the first block submitted into the regression analysis. Academic qualifications were entered second followed by the third block, college at time of enrollment. Independent variables with nominal scaling were re-coded into new dichotomous variables, also referred to as dummy variables. For example, for the independent variables of racial/ethnic background the original variable (1=White; 2=Black; 3=Asian; 4=Hispanic, etc) was recoded into separate dichotomous variables for each racial and ethnic group: White (1=yes; 0=no), etc. Hierarchical multiple regression was chosen as the statistical analysis because the variables were entered into the regression analysis in an intentional order. The three groups of variables are loosely chronological. The personal variables are brought into

the community college environment. It makes sense to account for the variance of these variables and then examine the academic variables to see how the higher education experience improves upon the prediction, followed by the college of major in which the diploma was earned.

Ancillary Analysis. ANOVA and t-tests were used to answer the first secondary research question, "Does university GPA differ significantly within the categorical independent variables used in this study?"

The mean university GPA for each group within the categorical independent variables was calculated. T-tests were conducted for gender, completion of an Associates degree, and completion of freshmen fundamental studies since there were only two groups within these independent variables. The t-test determined if there were significant differences in university GPA within these independent variables. ANOVA tests were conducted for all categorical independent variables with more than two groups. ANOVA determined if there were significant differences in university GPA within groups for the following independent variables: race, college of major, and community college. Since significant differences were found, a Dunnett's T3 Post Hoc analysis using $p<.05$ was conducted to determine which groups are significantly different from one another.

Bivariate Correlation was used to answer the second secondary research question, "Is there a relationship between university GPA and the continuous independent variables?" A correlation was conducted to determine the degree of the relationship between university GPA and each of the following variables: age, number of transfer credits, community college GPA, and first semester GPA.

This chapter has explained the methods used in this quantitative study of community college transfer students. The next chapter presents the results obtained with those methods.

Chapter 4: Results

The purpose of this study was to examine Maryland community college transfer students who graduated within five years from the University of Maryland College Park. The following null hypotheses were proposed:

Hypotheses 1: There are no significant predictors of university GPA for community college transfer students.

Hypotheses 2: There are no significant differences in university GPA among any of the categorical independent variables.

Hypotheses 3: There is no relationship between university GPA and any of continuous independent variables.

This chapter presents a description of the sample, modifications of the sample, and the multivariate and ancillary analysis results.

Data Collection

Description of Sample

According to the Office of the Registrar, 987 Maryland community college transfer students graduated from the University of Maryland-College Park within five years after transfer in fall of 1997 and spring of 1998. The mean age was 21.86 (SD=5.14), the mean number of accepted transfer credits was 44.33 (SD=20.30), the mean GPA after one semester was 2.66 (SD=.84) and the mean GPA upon graduation was 2.96 (SD=.49) (Table 4.1a).

Table 4.1a

Demographic Profile of Respondents by Age, Accepted Transfer Credits, transfer GPA, first semester GPA and Cumulative GPA (n=987)

	Minimum	Maximum	Mean	Std. Deviation
Age	16	69	21.86	5.14
AccTransCredits	0	106	44.33	20.30
firstgpa	.00	4.00	2.66	.84
cumgpa	1.99	4.00	2.96	.49

Of these 987 subjects, 449 (45.5%) were male and 538 (55.5%) were female.

The racial/ethnic distribution was 114 Black or African-American (11.6%), 181 Asian

or Pacific Islander (18.3%), 60 Hispanic (6.1%), 579 White (58.7%) and 53 Other or

Not Reported (5.4%) (Table 4.1b).

Table 4.1b

Demographic Profile by Gender, Race, and Age(n=987)

	Sample Frequency	Sample Percent	Cumulative Percent
Gender			
Male	449	45.50	45.50
Female	538	54.50	100.00
Race			
Black or African American	114	11.60	11.60
Asian or Pacific Islander	181	18.30	29.90
Hispanic	60	6.10	36.00
White	579	58.70	94.60
Other and Not Reported	53	5.40	100.00

Source institutions were as follows: 146 (14.8%) from Prince George's Community College, 476 (48.2%) from Montgomery Community College, 103 (10.4%) from Anne Arundel Community College and 262 (26.5%) students from other community colleges in the state of Maryland. Prior to transfer, 115 (11.7%) subjects earned an Associates degree. Of those in the sample, 293(29.7%) transfer students had not completed their freshmen fundamental studies requirements, with 694 (70.3%) students successfully completing their freshmen fundamental studies requirements prior to transfer. (Table 4.1c)

Table 4.1c

Demographic Profile by Community College, Fundamental Studies Completion, and Associates Degree(n=987)

	Sample Frequency	Sample Percent	Cumulative Percent
Community College			
Prince George's	146	14.80	14.80
Montgomery	476	48.20	63.00
Anne Arundel	103	10.40	73.50
Other	262	26.50	100.00
Fundamental Studies Completion			
Yes	694	70.30	70.30
No	293	29.70	100.00
Associates Degree Received			
Yes	115	11.70	11.70
No	872	88.30	100.00

The colleges from which the largest number of students graduated were the College of Behavioral and Social Sciences with 230 subjects (23.3%) and the School of Business with 215 subjects (21.8%). This is followed by the College of Arts and

Humanities with 134 subjects (13.6%), College of Education with 78 subjects

(7.9%), College of Computer, Mathematics and Physical Science with 57 subjects

(5.8%), College of Engineering with 64 subjects (6.5%), College of Life Sciences

with 66 subjects (6.7%), College of Agriculture and Natural Resources with 49

subjects (5%), Health and Human Performance with 77 subjects (7.8%), School of

Journalism with 8 subjects (.8%), School of Architecture Planning and Preservation

with 8 subjects (.1%), and 1 Individual Studies degree (.1%) (Table 4.1d).

Table 4.1d

Demographic profile by College of Graduation (n=987)

	Sample Frequency	Sample Percent	Cumulative Percent
College of Graduation			
BSOS	230	23.30	23.30
Arts and Humanities	134	13.60	36.90
Education	78	7.90	44.80
Business	215	21.80	66.60
CMPS	57	5.80	72.30
Engineering	64	6.50	78.80
Life Sciences	66	6.70	85.50
Agriculture and Natural Resources	49	5.00	90.50
Health and Human Performance	77	7.80	98.30
Journalism	8	.80	99.10
Architecture	8	.80	99.90
Undergraduate Studies	1	.10	100.00

Sample Modification

Data for the community college transfer GPA variable was only available for 530 of the 987 individuals in the total sample. A number of tests were conducted to compare the 530 subjects with a transfer GPA with the 457 subjects without the transfer GPA information (see Appendices A, B, and C). A chi-square and t-test analysis was conducted, comparing these two groups. Between these two groups, no significant differences were found in terms of gender, age, race, transfer credits, first semester GPA, fundamental studies and college of degree granted. The mean age for the sample with a transfer GPA was 21.74 (SD=4.85) while the mean age for the sample without a transfer GPA was 22.00 (SD=5.45). The t-test analysis did not reveal a significant difference in means (p=.417) with regard to age and transfer GPA availability.

The mean accepted transfer credits for the sample with a transfer GPA was 43.25 (SD=20.32) while the mean accepted transfer credits for the sample without a transfer GPA was 45.59 (SD=20.21). The t-test analysis did not reveal a significant difference in means (p=.071) with regard to accepted transfer credits and transfer GPA availability. The mean first semester GPA for the sample with a transfer GPA was 2.64 (SD=.84) while the mean first semester GPA for the sample without a transfer GPA was 2.68 (SD=.84). The t-test analysis did not reveal a significant difference in means (p=.381) with regard to first semester GPA and transfer GPA availability. The mean cumulative GPA for the sample with a transfer GPA was 2.97 (SD=.49) while the mean cumulative GPA for the sample without a transfer GPA was

2.94 (SD=.49). The t-test analysis did not reveal a significant difference in means

(p=.388) with regard to cumulative GPA and transfer GPA availability.

For the categorical data, a chi-square test was used to determine if there was a

difference between the sample with the transfer GPA data and the sample without the

transfer GPA data. The results indicated that there was no significant difference for

gender (p=.262), fundamental studies completion (p=.816), race (p=.262), or college

(p=.103) based on transfer GPA availability.

A significant difference was found between the group with the transfer GPA

and the group without a transfer GPA for the Associates Degree (p=.015) (Table 4.2a)

and Community College (p=.000) (Table 4.2b) independent variables.

Table 4.2a

Non-parametric Chi-square Results For Associates Degree and Transfer GPA Availability

	Associates Degree Received	No Associates Degree	Total	Significance (df)
GPA available	74	456	530	.015* (1)
GPA unavailable	41	416	457	

*p<.05

Table 4.2b

Non-parametric Chi-square Results For Community College and Transfer GPA Availability

	Prince George's	Mont-gomery	Anne Arundel	Other	Total	Significance (df)
GPA available	84	260	82	105	530	.000* (3)
GPA unavailable	62	216	22	157	457	

*p<.05

There were also no within group differences of cumulative GPA for race, gender, community college, fundamental studies, Associates degree, and college of major based on transfer GPA availability.

For Black or African Americans (p=.109), Asian or Pacific Islanders (p=.654), Hispanics (p=.748), Whites (p=.262) and Other or Not Reported (p=.407), cumulative GPA was not significantly different. Cumulative GPA based on transfer GPA availability within gender was not significantly different for males (p=.415) and females (p=.831). The cumulative GPA based on transfer GPA availability within the community college independent variable was significantly different for those from Other Community Colleges (p=.004) (Table 4.2c). Prince George's Community College (p=.182), Montgomery Community College (p=.558), Anne Arundel Community College (p=.401) were not significantly different based on transfer GPA availability.

Table 4.2c

T-test Cumulative GPA by Transfer GPA Availability Within Community College

		Total	Mean Cumulative GPA	Std. Deviation	t-statistic (df) p-value
Community College					
Prince George's	GPA available	84	2.87	.47	-1.34 (144)
	GPA unavailable	62	2.98	.50	.18
Montgomery	GPA available	260	3.00	.49	-.59 (474)
	GPA unavailable	216	3.02	.48	.558
Anne Arundel	GPA available	81	2.94	.48	.0.84 (101)
	GPA unavailable	22	2.84	.51	.401
Other	GPA available	105	3.01	.50	2.94 (260)
	GPA unavailable	157	2.84	.46	.004*

There were no significant differences in cumulative GPA based on transfer

GPA availability for those with an Associates degree (p=.19) and those without an

Associates degree (p=.20). For the fundamental studies variable, no significant

differences were found for those who completed Fundamental studies (p=.89) and

those who did not complete fundamental students (p=.17).

There were no significant differences in cumulative GPA based on transfer

GPA availability within the college of major independent variable for the college of

Behavioral and Social Sciences (p=.83), College of Arts and Humanities (p=.24),

College of Education (p=.31), School of Business (p=.44), College of Mathematics

and Physical Science (p=.71), College of Engineering (p=.06), College of Life

Sciences (.51), College of Agriculture and Natural Resources (.20), College of Health

and Human Performance (.31), School of Journalism (.87) and the School of

Architecture, Planning and Preservation (p=.23).

The sample groups, divided by those with the transfer GPA available and

those with the transfer GPA unavailable were not significantly different in terms of

the frequencies and means of the independent variables: gender, age, race, transfer

credits, community college GPA, first semester GPA, completion of fundamental

studies, and the college of major. Associates degree completion and community

college attended were significantly different between the sample with the transfer

GPA and the sample without the transfer GPA.

For the dependent variable, cumulative GPA, there were not within group

differences for all of the categorical data: gender, race, community college,

completion of fundamental studies, Associates degree completion, fundamental

studies completion and the college of major.

Therefore, for the purposes of this study, only the 530 subjects with the

transfer GPA variable were used as the sample for this study.

Limitations

A limitation of the sample was that the transfer GPA was not available for 457

of the 930 subjects in the original sample. Only a portion of the original sample was

used in the data analysis because of this missing data. There were significant

differences between the subjects with the transfer GPA available and the subjects

without a transfer GPA available for the Associates degree and community college

independent variables.

Results

Using the sample of 530 subjects, descriptive statistics are presented below

followed by the intercorrelation matrix, multivariate and ancillary analysis.

Description of the Sample

The mean age of subjects was 21.74. The mean number of accepted transfer

credits was 43.25, the mean transfer GPA was 3.09, the mean first semester GPA

after transfer was 2.64, and the mean cumulative GPA at the university was 2.64

(Table 4.3a).

Table 4.3a

Demographic Profile of Respondents by Age, Accepted Transfer Credits, transfer GPA, first semester GPA and Cumulative GPA (n=530)

	Minimum	Maximum	Mean	Std. Deviation
Age	16	60	21.74	4.85
AccTransCredits	0	105	43.25	20.32
transgpa	.50	4.00	3.09	.55
firstgpa	.00	4.00	2.64	.84
cumgpa	2.00	4.00	2.97	.49

Of these 530 subjects, 232 (44.8%) were male and 298 (56.2%) were female. The racial/ethnic distribution was 61 Black or African-American (11.5%), 88 Asian or Pacific Islander (16.6%), 29 Hispanic (5.5%), 579 White (33.6%) and 34 Other or Not Reported (6.4%). Of the sample, 74 (14%) of the subjects received an Associates degree, while 456 (86%) subjects transferred without an Associates degree. The majority of subjects in the sample transferred from three Maryland community colleges. Of the 530 subjects, 84 (15.8%) transferred from Prince George's Community College, 260 (49.1%) from Montgomery Community College, 81 (15.3%) from Anne Arundel Community College, and 105 (19.8%) from other Maryland community colleges. Prior to transfer, 371 subjects (70%) completed their freshmen fundamental studies requirements while 159 (30%) did not complete freshmen fundamental studies.

Students in this sample were enrolled in every undergraduate college at the university. There were 138 (26%) subjects from The College of Behavioral and Social Sciences (BSOS), 75 (14.2%) from the College of Arts and Humanities

(ARTHU), 45 (8.5%) from the College of Education (EDUC), 116 (21.9%) from the

School of Business, 30(5.7%) from the College of Computer, Mathematical and

Physical Science (CMPS), 29 (5.5%) from the School of Engineering, 31 (5.8%) from

the College of Life Sciences, 27 (5.1%) from the College of Agriculture and Natural

Resources (AGNR), 34 (6.4%) from the College of Health and Human Performance

(HHP), 4 (.8%) from the College of Journalism (JOUR) and 1 (.2%) from the College

of Architecture, Planning and Preservation (ARCH). (Table 4.3b)

Table 4.3b

*Demographic Profile by Gender, Race, Associates Degree, Community College,
Fundamental Studies and College of Major (n=530)*

	Sample Frequency	Sample Percent	Cumulative Percent
Gender			
Male	232	43.80	43.80
Female	298	56.20	100.00
Race			
Black or African American	61	11.50	11.50
Asian or Pacific Islander	88	16.60	28.10
Hispanic	29	5.50	33.60
White	318	60.00	93.60
Other and Not Reported	34	6.40	100.00
Associates Degree			
Associates Degree Received	74	14.00	14.00
No Associates Degree	456	86.00	100.00

Community College			
Prince George's	84	15.80	15.80
Montgomery	260	49.10	64.90
Anne Arundel	81	15.30	80.20
Other	105	19.80	100.00
Fundamental Studies			
Fundamental Studies Completed	371	70.00	70.00
Fundamental Studies Not Completed	159	30.00	100.00
College			
BSOS	138	26.00	26.00
ARTHU	75	14.20	40.20
EDUC	45	8.50	48.70
BUSINESS	116	21.90	70.60
CMPS	30	5.70	76.20
Engineering	29	5.50	81.70
Life Science	31	5.80	87.50
AGNR	27	5.10	92.60
HHP	34	6.40	99.10
JOUR	4	.80	99.80
ARCH	1	.20	100.00

Multicollinearity. Prior to regression analysis a Pearson correlation matrix was generated to check for multicollinearity. An R^2 value of .6 or greater indicates a potential problem (Table 4.4). None of the R^2 values were greater than .6, indicating that multicollinearity was not a concern.

Table 4.4

Pearson Correlation Matrix

	Gender	Age	Race	Commcoll	Trans gpa	AA	Fundstud	FirstGpa	AccTranCredits	College
Gender	1.00	-.05	-.05	-.11	.10	-.04	-.003	.02	.01	.05
Age	-.05	1.00	.00	-.11	.10	-.12	-.18	.14	.19	.06
Race	-.05	.00	1.00	.26	.05	.02	.00	.08	-.07	.00
Commcoll	-.11	-.11	.26	1.00	.02	.00	.097	.02	-.07	.05
Transgpa	.10	.10	.05	.02	1.00	.05	.053	.42	-.06	.08
AA	-.04	-.12	.02	.00	.05	1.00	.133	.00	-.38	-.05
Fundstud	-.00	-.18	.00	.01	.05	.13	1.00	.04	-.35	-.11
Firstgpa	.02	.14	.08	.02	.42	.00	.036	1.00	-.02	.05
AccTranCredits	.01	.19	-.07	-.07	-.06	-.38	-.347	-.02	1.00	.07
College	.05	.06	.00	.05	.08	-.05	-.112	.05	.07	1.00

The variance inflation factor analysis (Table 4.5) confirmed no significant correlations because all factors were significantly less than 10.

Table 4.5

Variance Inflation Factor

Variable	VIF
Gender	1.03
AGE	1.10
RACE	1.08
COMMCOLL	1.11
TRANSGPA	1.25
AA	1.17
FUNDSTUD	1.18
FIRSTGPA	1.24
AccTransCredits	1.33
COLLEGE	1.03

Multivariate Analysis

The primary research question was, "Which variables, if any, are predictors of the variance in GPA for community college transfer students who persist to graduation?" Hierarchical regression was used to determine if the independent variables were significant predictors of cumulative GPA. The first block entered into the regression, personal characteristics, consisted of age, race, and community college. The predictors in block one accounted for 12.7 percent of the variance ($p=.000$). Age ($p=.005$), White ($p-.047$), and Gender ($p=.035$) were all significant predictors of the variance in cumulative GPA. The second block, academic characteristics, consisted of transfer GPA, Associates degree, fundamental studies, first semester GPA, and accepted transfer credits. The predictors in block two accounted for 43.2 percent ($p=.000$) of the variance in cumulative GPA after controlling for block one. Transfer GPA ($p=.000$) and First Semester GPA ($p=.000$) were both significant predictors of cumulative GPA variance. The third predictor, major, consisted of the eleven colleges. This predictor accounted for 3.2 percent of the variance after controlling for block one and two ($p=.000$). The college of Arts and Humanities (ARTHU) ($p=.005$) and the College of Education (EDUC) ($p=.000$) were predictors of cumulative GPA (Table 4.6). Three variables (School of Business, College of Engineering, and College of Agriculture and Natural Resources) were excluded in the regression analysis because the tolerance limit was reached with the other eight college of major variables.

Table 4.6

Summary of Hierarchical Regression Analysis for Variables Predicting Cumulative GPA

Variable	R Square	R Square Change	F Change	Beta	Sig
Step 1					
Personal Characteristics	.13	.13	8.42		.000*
Age				.09	.005**
Black				-.03	.564
Asian				.03	.501
Hispanic				.06	.116
White				.12	.047*
PGCC				-.02	.603
MCCC				.04	.356
OtherCC				.05	.215
Gender				.07	.035*
Step 2					
Academic Characteristics	.559	.432	100.831		.000***
AccTransferCredits				-.03	.331
TransGPA				.28	.000***
AA				-.03	.420
FundStud				.02	.442
FirstGPA				.51	.000***
Step 3					
Major	.591	.032	4.941		.000*
BSOS				.04	.212
ARTHU				.10	.005*
EDUC				.19	.000*
JOUR				-.01	.628
ARCH				.00	.932
CMPS				-.00	.917
LIFESCI				-.02	.570
HHP				.02	.588

*p<05

The first null hypothesis was, "There will be no significant predictors of university GPA for community college transfer students." All three blocks significantly predicted the variance in cumulative GPA, thus the null hypothesis was rejected.

Ancillary Analysis

The ancillary analysis answers the secondary research questions. The first secondary research question was "Does university GPA differ significantly within the categorical independent variables used in this study?"

The mean cumulative GPA for gender, Associates degree completion and fundamental studies completion was calculated and then analyzed using a t-test. For gender, women's mean GPA was significantly higher than men's (p=.003). The mean cumulative GPA within the Associates degree and fundamental studies variables were not significantly different (p=.919, p=.137).

Table 4.7

T-tests Cumulative GPA by Gender, Associates Degree, and Fundamental Studies

	Total	Mean Cum. GPA	Standard Deviation	t-statistic (df) p-value
Gender				
Male	232	2.90	.48	-2.95 (528)
Female	298	3.03	.49	p = .003*
Associates Degree				
Associates Degree Earned	74	2.97	.48	-.12 (528)
No Associates Degree	456	2.97	.49	p = .919
Fundamental Studies				
Fundamental Studies Completed	371	2.95	.49	-1.49 (528) p = .137
Fundamental Studies Not Completed	159	3.02	.49	

For the categorical independent variables of race, community college and college of major, ANOVA tests were used to determine any significant differences in university GPA within groups. The ANOVA results indicate a significant difference for race (p=.000). Post-Hoc tests using Dunnet's T3 test identify that White subjects had significantly higher GPAs than Black or African American subjects. There were no other significant within group differences for the race independent variable (see appendix D).

Table 4.8a

Analysis of Variance for Race

	N	Mean	SD	$SS_{Between}$ SS_{within}	$df_{Between}$ df_{Within}	F	p
Black or African American	61	2.72	.39	6.94 119.91	4 525	7.59	.000*
Asian or Pacific Islander	88	2.91	.47				
Hispanic	29	23.00	.50				
White	318	3.05	.49				
Others Reported	34	2.84	.52				

Table 4.8b

Dunnet T3 Post-Hoc Test for Analysis of Variance for Race (White)

(I) RACE	(J) RACE	Mean Difference (I-J)	Sig.
White	Black or African American	.33	.000*
	Asian or Pacific Islander	.14	.125
	Hispanic	.05	1.000
	Others Reported	.21	.240

An analysis of variance was conducted to compare the groups within the community college and college of major upon graduation variables. No significant within group differences were detected (p=.164) for the community college variable. A significant difference was found (p=.000) for the college of major upon graduation. Dunnett's T3 post-hoc tests indicated that College Education subjects had significantly higher GPAs than subjects from College of Behavioral and Social Sciences (p=.000), College of Arts and Humanities (p=.000), School of Business (p=.000), College of Computer, Mathematics, and Physical Sciences (p=.000), College of Engineering (p=.000), College Life Sciences (p=.003), College of Agriculture and Natural Resources (p=.000), and Health and Human Performance (p=.000). No other significant within group differences were found (see appendix D).

Table 4.8c

Analysis of Variance for College of Major

	N	Mean	SD	$SS_{Between}$ SS_{within}	$df_{Between}$ df_{Within}	F	p
BSOS	138	2.88	.49	11.23	9	5.61	.000*
ARTHU	75	3.00	.49	115.44	519		
Education	45	3.41	.37				
Business	116	3.01	.43				
CMPS	30	2.91	.58				
Engineering	29	2.87	.44				
Life Sciences	31	2.91	.57				
AGNR	27	2.86	.48				
HHP	34	2.88	.41				
JOUR	4	2.91	.32				
Total	529	2.97					

Table 4.8d

Dunnett T3 Post-Hoc Test for Education College

(I) COLLEGE	(J) COLLEGE	Mean Difference (I-J)	Sig.
Education	BSOS	.53	.000*
	ARTHU	.41	.000*
	Business	.40	.000*
	CMPS	.50	.005*
	Engineering	.54	.000*
	Life Sciences	.50	.003*
	AGNR	.55	.000*
	HHP	.53	.000*
	JOUR	.50	.416

* The mean difference is significant at the .05 level.

The second null hypothesis was, "There are no significant differences in university GPA among any of the categorical independent variables." Significant differences in university GPA and gender, race, and college of major were found, thus the second null hypothesis was rejected.

The second secondary research question was, "Is there a relationship between university GPA and the continuous independent variables?" A bivariate correlation was conducted to determine the degree of the relationship between cumulative GPA and each of the following variables: age, number of transfer credits, community college GPA, and first semester GPA. Results indicated significant correlations between Age and Accepted transfer credits (p=.000), Transfer GPA (p = .019), first semester GPA (.001), and cumulative GPA (p=.000). Transfer GPA was significantly correlated with cumulative GPA (p=.000) and first semester GPA was significantly correlated with cumulative GPA (p=.000).

Table 4.9

Correlation for Age, Accepted Transfer Credits, Transfer GPA, First Semester GPA and Cumulative GPA

		AGE	AccTransCredits	TRANSGPA	FIRST GPA	CUM GPA
CUMGPA	Pearson Correlation	.18	-.04	.51	.67	1
	Sig. (2-tailed)	.000*	.343	.000*	.000*	.
	N	530	530	530	530	530

* p<.05

Summary

The results presented in this chapter reveal a number of significant results. Age, race (white), gender (female), transfer GPA, first semester GPA, and college (Arts and Humanities and Education) were all found to be significant predictors of variance in cumulative university GPA for community college transfer students. Women, White subjects, and College of Education graduates are significantly more likely to earn higher cumulative GPAs than the other subjects within each of these variables. University GPA was found to have a significant positive correlation with age, transfer GPA, and first semester GPA. The next chapter discusses the findings, implications, generalizability of the study, and suggestions for future research.

Chapter 5: Discussion

This study examined 530 community college transfer students who graduated from the University of Maryland-College Park. Personal and academic characteristics along with college of major were investigated to determine if any of these variables are significant predictors of university GPA. Personal characteristics included age, race, gender, and community college. Academic characteristics included transfer GPA, accepted transfer credits, Associates degree completion, fundamental studies completion, and first semester GPA. This study also sought to discover if there were significant differences in university GPA among the categorical independent variables, and if there was a relationship between university GPA and any of the continuous independent variables. An analysis of personal and academic characteristics along with college of major in relation to the cumulative university GPA revealed a number of significant findings.

Summary of Findings

At the beginning of the study, the following null hypotheses were proposed:

Hypotheses 1: There are be no significant predictors of university GPA for
  community college transfer students.

Hypotheses 2: There are no significant differences in university GPA among any of
  the categorical independent variables.

Hypotheses 3: There is no relationship between university GPA and any of
continuous independent variables.

The first null hypothesis is rejected. Age, race (white), gender (female), transfer GPA, first semester GPA, and college (Arts and Humanities and Education) were all found to be significant positive predictors of variance in cumulative university GPA for community college transfer students.

The second null hypothesis was also rejected. Women, White subjects, and College of Education graduates are significantly more likely to earn higher cumulative GPAs than the other subjects within the variable.

Finally, the third null hypothesis was also rejected. University GPA was found to have a significant positive correlation with age, transfer GPA, and first semester GPA.

<center>Implications</center>

Many of the findings in this study support prior research. The most consistent finding in previous studies was the relationship between university GPA and transfer GPA. Transfer GPA was also found to be a significant factor in this study. Students in this study also exhibited evidence of transfer shock (Hills, 1965), the phenomenon of a temporary dip in transfer students academic performance in the first or second semester after they transfer. With a mean transfer GPA of 3.09, a mean first semester GPA of 2.65 and a mean cumulative GPA of 2.97, it is apparent that on average, students' GPAs dipped in their first semester but rebounded by the time they graduated. The mean cumulative GPA is lower than the transfer GPA, indicating a suggested higher level of difficulty at the university. However, the first semester GPA was still considerably lower than the mean cumulative university GPA.

Many previous studies revealed a bifurcation in age of the transfer student population with many young traditional aged students as well as students in their late 20s and beyond. This was not evident in the sample used in this study. Although the age range was from 16 to 60, the average age was 21-years-old and the mode age was 19-years-old. Of the 530 subjects, 75% were 22-years-old or younger and 95% were 30 or younger. A distinct split in the age range of the subjects in the sample was not apparent.

These significant results have a number of implications for admissions and support services for community college transfer students.

Admissions

Study results indicated that students who enter with low GPAs are significantly more likely to earn low GPAs at the university. Admissions offices need to be aware of this relationship when reviewing community college transfer student applications. Universities need to analyze the ethics of admitting students who fall into these low GPA categories. Examining our ethical obligations to admitting transfer students who exhibit these indicators is important in our daily practice as university professionals. One limitation of this implication is that the university is required to admit students with an Associates Degree from a Maryland Community College. However, this only impacts a fraction of community college transfer students.

Secondly, graduates of the College of Arts and Humanities and the College of Education were predictors of higher university GPAs. Transfer to the university is a process with relatively generic transfer standard. However, certain majors are Limited

Enrollment programs which mean they have more selective standards than majors

that are open to all students. The School of Business, School of Engineering, College

of Education, College of Journalism and School or Architecture are all limited

enrollment. In addition, the department of Psychology (College of Behavioral and

Social Sciences), Department of Government and Politics (College of Behavioral and

Social Sciences), Department of Landscape Architecture, and Department of

Communication (College of Arts and Humanities) are majors with limited enrollment

restrictions. It should also be noted that the data used the college of major upon

graduation. This may not be the college a student initially enrolled in at their time of

entry to the university.

Support Services

The results of this study have many implications for support services available

to transfer students. Specifically there are implications for academic advising,

learning assistance services, and academic support services geared towards students

of color. Academic advisors should be aware of students who are male, students of

color, or have low transfer GPAs because these are at-risk indicators of a low GPA.

These students are more likely to need additional academic support. Monitoring these

students progress may be especially important. Students who earn a low first semester

GPA are also in danger of not succeeding. Academic advisors and other student

services professionals must remain informed of these signs, and make the appropriate

referral resources to assist these students early on to ensure that they can be

academically successful.

In the analysis of race, White students were significantly more likely to have higher GPAs than all other students of color. The relationship is so strong that being White was a predictor of cumulative GPA. This reinforces the need for academic support services specifically oriented towards students of color. A gap in the success of White student and students of color should be a concern for all student services professionals. Particular attention to these populations is critical. If the university admits students, we need to ensure that resources are in place to support these students in their pursuit of Bachelors' degree. The university needs to be committed to providing support to all its students.

Student Life

As mentioned previously, 75% of the students in this sample were 22-years-old or younger. Although campus involvement was not investigated in this study, this large number of traditional aged students may be seeking a traditional college experience. This has implications for orientation and efforts to engage transfer students in campus involvement. When there is a high demand for on-campus housing, transfer students may not even have the option of living on campus. Campus residence life officials should consider their responsibilities to offer transfer students of traditional age the opportunity for a campus residential experience. It is important that students seeking local off-campus housing are provided adequate resources to inform them of rental information and vacancies. A review of outreach programs to involve transfer students in campus life is also imperative in assuring that transfer students are receiving the same services as their peers who began their higher education at the four-year institutions.

Student Development Theory

The finding that age is a significant predictor of university GPA is supported by a number of student development theories. According to Schlossberg, Waters and Goodman (1995), four major sets of factors exist that impact the coping ability of a person: situation, self, support, and strategies. The self factor refers to personal and demographic characteristics such as socioeconomic status, gender, age, stage of life, state of health and ethnicity. Age is not simply referring to years, but rather the psychological and social age of the individual. However, age may be an indication of these components. Further research of the success of community college transfer students could be examined using the transition theory framework of Schlossberg (1989). Assessing the situation, self, support and strategies of successful community college transfer students could shed further light on this population.

Age as a predictor of academic success can also be explained using Chickering's (1969) psychosocial identity development theory. Students who enter a four-year institution older than traditionally aged students may have progressed further than their peers in their development in Chickering's seven vectors.

Generalizability of the Findings

One criticism of the literature reviewed in chapter two was the small number of students of color subjects in these studies. In this study, there were large numbers of students of color for the categories of Black or African American (61), Asian (88) and Hispanic (29). Findings from this study may be more valid than studies with 5-10 subjects in each category. As mentioned in Chapter two, many studies referenced in

current literature are based on data from the 1970s and 1980s. This study provides results based on recent data, and can provide a current reference for future studies.

Limitations of Study

There were a number of limitations to this study. It did not study students who transfered from four-year institutions. It only examined variables that were accessible in the University database. Issues mentioned in prior research such as measures of academic and social integration, working status, and socio-economic status were not addressed in this study. The sample population was students who completed Bachelor's degrees. It is important to remember who was not studied. Students who never transfer from community colleges and students who transferred but did not successfully persist to graduation are not addressed in this study.

The location of this study was also a limitation. This study took place at a large, public, research I institution in the mid-Atlantic. Results are specific to that institution and may not be generalizable to other institutions.

Selecting the sample by using stratified sampling means there was no oversampling of certain subpopulations of students. There were no American Indian/Alaskan Native subjects in the sample, preventing statistically significant data from being collected for this population. Limiting this study to transfer students from Maryland community colleges decreased the generalizability of the study. It is unknown if the inclusion of out-of-state community college transfer students would have impacted the results of this study. The race information collected from admissions applications may not be how the individual student identifies racially or ethnically, forced to choose from five options. This can be particularly troublesome

64

for multiethnic students and race or ethnicities that do not fit neatly into one of the provided options. Helms, Jernigan, and Mascher (2005) question the validity of using race as an independent variable. They argue that, "Racial categories lack conceptual meaning relative to other psychological constructs" (p. 29). Race isn't based on any type of theory nor does it involve intentional manipulation or a type of measurement of behaviors or attributes. Inferring behaviors or characteristics from a racial category is problematic, according to Helms, Jernigan, and Mascher.

The gender categories of male or female may not be appropriate options for students who identify differently (such as transgender). No data was collected on transgender students and the size of this population is unknown.

The college of major variable was based on the college from which the Bachelor's degree was earned. It is unknown how many subjects were admitted to the university into a different colleges than the colleges from which they graduated.

Typically, an Associates degree requires 60 credits. 21% (111 subjects) of the 530 subjects transferred 60 or more credits but only 14% (74 subjects) of the subjects earned an Associates degree prior to transfer. The accuracy of the data provided for the Associates degree is unclear. Apparently, this information is not always recorded in the admissions review process, and the issue is compounded by the fact that some students are accepted before they have completed their final semester at the community college. So, at the time of acceptance they have not completed their Associates degree because their final requirements are still in progress.

Suggestions for Further Research

The results of this study raise many new questions for further research. This study only examined the successful transfer students. In the 1997-1998 academic year, 1598 Maryland community college students transferred to University of Maryland-College Park (Maryland Higher Education Commission, 2002). Of concern is what happened to the other 641 transfer students that did not graduate. Studying this population of students could provide further insight into the variables that may be associated with the unsuccessful transfer students. This graduation rate of 60% is also lower than the graduation rate for native students. The six-year graduation rate for the fall 1997 cohort of native students was 71% (Office of Institutional Research and Planning, n.d.). It is important to be aware of the gap between retention of native students and transfer students. Our institutional pride is linked to retention of native students. However, institutions have an ethical responsibility to serve all of our students. If serving transfer students is important to universities, these retention rates inform us that we need to examine this population further to explore what needs are not been met.

A comparison of the transfer students who were successful and the transfer students who were not successful would also shed some light on the transfer student population. Determining if there are differences in graduation rates based on demographic variables, community college attended, or college of major at time of admission would be informative. Reviewing the status of students who did not graduate, such as those who are academically dismissed and those who leave the

university in good standing could be beneficial in understanding why some transfer students do not earn a Bachelor's degree.

Examining patterns of changes in major after transfer students are admitted to the university would also be beneficial. Determining if students are more likely to be unsuccessful in certain majors would be helpful for admissions and student services professionals in the individual colleges.

This study did not delve into academic and social integration, a key component of Tinto's (1993) retention theory. It is commonly thought that community college transfer students are nontraditional students who have family and work obligations, and therefore do not have time to become involved on-campus. The age of the majority of transfer students in this study counters the very premise of this notion. As mentioned earlier, 75% of the students in this sample were 22-years-old or younger. One could conjecture that these traditional aged college students are seeking involvement opportunities similar to their peers who began their higher education at the four-year institution. Developing a study to examine the desire for social integration could shed light on the social needs of this transfer population.

Summary

This study of Maryland community college transfer students provided some excellent information on this population. There are many significant relationships between a number of variables and cumulative GPA of community college transfer students who persist to graduation. These results have implications for admissions, student services, and the student life of community college transfer students. This study found that the best predictors of future behavior (university GPA) are past

behaviors (community college GPA). This study serves as a basis for further research into this increasingly significant student population.

APPENDIX A

T-Test Comparison of Independent Variables Based on Transfer GPA Availability

Table 1

T-tests Accepted Transfer Credits of Transfer Student by Transfer GPA Availability

	Total	Mean Score	Standard Deviation	t-statistic (df) p-value
Accepted Transfer Credits				
GPA available	530	43.25	20.32	1.81(985)
GPA unavailable	457	45.59	20.21	p = .071

Table 2

T-tests Age of Transfer Student by Transfer GPA Availability

	Total	Mean Score	Standard Deviation	t-statistic (df) p-value
Age				
GPA available	530	21.74	4.85	.81 (985)
GPA unavailable	457	22.00	5.45	p = .417

Table 3

T-tests First Semester GPA of Transfer Student by Transfer GPA Availability

	Total	Mean Score	Standard Deviation	t-statistic (df) p-value
First Semester GPA				
GPA available	530	2.64	.84	.88 (985)
GPA unavailable	457	2.68	.84	p = .381

Table 4

T-tests Cumulative GPA of Transfer Student by Transfer GPA Availability

	Total	Mean Score	Standard Deviation	t-statistic (df) p-value
Cumulative GPA				
GPA available	530	2.97	.49	-.86 (985)
GPA unavailable	457	2.94	.49	p = .388

APPENDIX B

Chi-Square Comparison of Independent Variables Based on Transfer GPA
Availability

Table 1

Non-parametric Chi-square Results For Gender, Fundamental Studies and Race

	Male	Female	Total	significance (df)
GPA available	232	298	530	.262 (4)
GPA unavailable	217	240	457	
	Fundamental Studies Completed	Fundamental Studies Not Completed	Total	significance (df)
GPA available	371	159	530	.816 (1)
GPA unavailable	323	134	457	

Table 2

Non-parametric Chi-square Results for Race and Transfer GPA Status

	Black or African American	Asian or Pacific Islander	His-panic	White	Other or Not Reported	Total	Significa-nce (df)
GPA available	61	88	29	218	34	530	.262 (4)
GPA unavailable	52	93	261	19	19	457	

Table 3

Non-parametric Chi-square Results for College and Transfer GPA Status

	BS[1]	HP[2]	JR[3]	UG[4]	AR[5]	ED[6]	BU[7]	CM[8]	EN[9]	LF[10]	AN[11]	AR[12]	Total	Significance (df)
GPA available	138	45	4	0	75	45	116	30	18	31	27	1	530	.103 (11)
GPA unavailable	92	58	4	1	59	33	99	27	20	35	22	7	457	

[1]College of Behavioral and Social Sciences [2]College of Health and Human Performance [3]College of Journalism [4]Undergraduate Studies [5]College of Arts and Humanities [6]College of Education [7]School of Business [8]College of Computer, Mathmatical and Physical Science [9]College of Engineering [10]College of Life Sciences [11]College of Agriculture and Natural Resources [12]College of Architecture, Planning and Preservation

Within Group Comparison of Independent Variables Based on Transfer GPA
Availability

Table 1

T-test Cumulative GPA by Transfer GPA Availability Within Race

		Total	Mean Cumulative GPA	Std. Deviation	t-statistic (df) p-value
Race					
Black or African American	GPA available	61	2.72	.39	-1.62 (112)
	GPA unavailable	53	2.85	.47	.109
Asian or Pacific Islander	GPA available	88	2.91	.47	.45 (179)
	GPA unavailable	93	2.88	.49	.654
Hispanic	GPA available	29	3.00	.50	.32 (58)
	GPA unavailable	31	2.96	.48	.748
White	GPA available	318	3.05	.49	1.12 (577)
	GPA unavailable	261	3.01	.48	.262
Other and Not Reported	GPA available	34	2.84	.52	.84 (51)
	GPA unavailable	19	2.71	.52	.407

Table 2

T-test Cumulative GPA by Transfer GPA Availability Within Gender

Gender		Total	Mean Cumulative GPA	Std. Deviation	t-statistic (df) p-value
Male	GPA available	232	2.90	.48	.82 (447)
	GPA unavailable	217	2.87	.47	.415
Female	GPA available	298	3.03	.49	.21 (536)
	GPA unavailable	240	3.02	.49	.831

Table 3

T-test Cumulative GPA by Transfer Availability Within Associates Degree Completion

Associates Degree		Total	Mean Cumulative GPA	Std. Deviation	t-statistic (df) p-value
Associates Degree Earned	GPA available	74	2.97	.48	-1.33 (113) .188
	GPA unavailable	41	3.09	.51	
No Associates Degree	GPA available	456	2.97	.49	1.28 (870) .200
	GPA unavailable	416	2.93	.48	.

Table 4

T-test Cumulative GPA Transfer GPA Availability Within Fundamental Studies

		Total	Mean Cumulative GPA	Std. Deviation	t-statistic (df) p-value
Fundamental Studies Fundamental Studies Complete	GPA available	371	2.95	.49	.13 (692) .894
	GPA unavailable	323	2.95	.48	.
Fundamental Studies Not Complete	GPA available	159	3.02	.49	1.35 (291) .170
	GPA unavailable	134	2.94	.50	.

Table 5

T-test Cumulative GPA by Transfer GPA Availability Within College

College		N	Mean Cumulative GPA	Std. Deviation	t-statistic (df) p-value
BSOS	GPA available	138	2.88	.49	.28 (228)
	GPA unavailable	92	2.87	.52	.828
ARTHU	GPA available	75	3.00	.49	1.17 (132)
	GPA unavailable	59	2.90	.47	.244
Education	GPA available	45	3.41	.37	1.02 (76)
	GPA unavailable	33	3.33	.30	.312
Business	GPA available	116	3.01	.43	-.77 (213)
	GPA unavailable	99	3.05	.42	.444
CMPS	GPA available	30	2.91	.58	.37 (55)
	GPA unavailable	27	2.85	.50	.710
Engineering	GPA available	29	2.87	.44	-1.94 (62)
	GPA unavailable	35	3.11	.52	.057
Life Sciences	GPA available	31	2.91	.57	.65 (64)
	GPA unavailable	35	2.82	.55	.510
AGNR	GPA available	27	2.86	.48	1.29 (47)
	GPA unavailable	22	2.69	.42	.205
HHP	GPA available	34	2.88	.41	1.03 (75)
	GPA unavailable	43	2.78	.45	.307
JOUR	GPA available	4	2.91	.32	.18 (6)
	GPA unavailable	4	2.86	.41	.866
ARCH	GPA available	1	3.40	.	1.33 (6)
	GPA unavailable	7	3.11	.20	.231

APPENDIX D

Analysis of Variance and Post-Hoc Tests for Categorical Independent Variables

Table 1

Dunnet T3 Post-Hoc Test for Analysis of Variance for Race

(I) RACE	(J) RACE	Mean Difference (I-J)	Sig.
Black or African American	Asian or Pacific Islander	-.20	.069
	Hispanic	-.28	.099
	White	-.33	.000*
	Others Reported	-.12	.919
Asian or Pacific Islander	Black or African American	.19	.069
	Hispanic	-.09	.993
	White	-.14	.125
	Others Reported	.07	.999
Hispanic	Black or African American	.28	.099
	Asian or Pacific Islander	.09	.993
	White	-.05	1.000
	Others Reported	.16	.912
White	Black or African American	.33	.000*
	Asian or Pacific Islander	.14	.125
	Hispanic	.05	1.000
	Others Reported	.21	.240
Others Reported	Black or African American	.12	.919
	Asian or Pacific Islander	-.07	.999
	Hispanic	-.16	.912
	White	-.21	.240

Table 2

Analysis of Variance for Community College

	N	Mean	SD	$SS_{Between}$ SS_{within}	$df_{Between}$ df_{Within}	F	p
Prince George's	84	2.87	.47	1.22	3	1.71	.164
Montgomery	260	3.00	.49	125.62	526		
Anne Arundel	81	2.94	.48				
Other	105	3.01	.50				

Table 3

Dunnett T3 Post-Hoc Test

(I) COLLEGE	(J) COLLEGE	Mean Difference (I-J)	Sig.
BSOS	ARTHU	-.12	.988
	Education	-.53	.000*
	Business	-.13	.720
	CMPS	-.03	1.000
	Engineering	.01	1.000
	Life Sciences	-.03	1.000
	AGNR	.02	1.000
	HHP	-.00	1.000
	JOUR	-.028	1.000
ARTHU	BSOS	.12	.988
	Education	-.41	.000*
	Business	-.01	1.000
	CMPS	.09	1.000
	Engineering	.12	1.000
	Life Sciences	.09	1.000
	AGNR	.14	1.000
	HHP	.12	1.000
	JOUR	.09	1.000
Education	BSOS	.53	.000*
	ARTHU	.41	.000*
	Business	.40	.000*
	CMPS	.50	.005*
	Engineering	.54	.000*
	Life Sciences	.50	.003*
	AGNR	.55	.000*
	HHP	.53	.000*
	JOUR	.50	.416
Business	BSOS	.13	.720
	ARTHU	.01	1.000
	Education	-.40	.000*
	CMPS	.10	1.000
	Engineering	.15	.995
	Life Sciences	.10	1.000
	AGNR	.15	.995
	HHP	.13	.992
	JOUR	.10	1.000

CMPS	BSOS	.03	1.000
	ARTHU	-.09	1.000
	Education	-.50	.005*
	Business	-.10	1.000
	Engineering	.03	1.000
	Life Sciences	.00	1.000
	AGNR	.05	1.000
	HHP	.03	1.000
	JOUR	-.00	1.000
Engineering	BSOS	-.01	1.000
	ARTHU	-.12	1.000
	Education	-.54	.000*
	Business	-.14	.995
	CMPS	-.03	1.000
	Life Sciences	-.03	1.000
	AGNR	.01	1.000
	HHP	-.01	1.000
	JOUR	-.04	1.000
Life Sciences	BSOS	.03	1.000
	ARTHU	-.10	1.000
	Education	-.50	.003*
	Business	-.10	1.000
	CMPS	-.00	1.000
	Engineering	.03	1.000
	AGNR	.05	1.000
	HHP	.03	1.000
	JOUR	-.00	1.000
AGNR	BSOS	-.02	1.000
	ARTHU	-.14	1.000
	Education	-.55	.000*
	Business	-.15	.995
	CMPS	-.05	1.000
	Engineering	-.01	1.000
	Life Sciences	-.05	1.000
	HHP	-.02	1.000
	JOUR	-.05	1.000
HHP	BSOS	.00	1.000
	ARTHU	-.12	1.000
	Education	-.53	.000*
	Business	-.13	.992
	CMPS	-.03	1.000
	Engineering	.01	1.000
	Life Sciences	-.03	1.000
	AGNR	.02	1.000
	JOUR	-.03	1.000

JOUR	BSOS	.03	1.000
	ARTHU	-.09	1.000
	Education	-.50	.416
	Business	-.10	1.000
	CMPS	.00	1.000
	Engineering	.04	1.000
	Life Sciences	.00	1.000
	AGNR	.05	1.000
	HHP	.03	1.000

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