California State University,

Fullerton

EFFECTS OF STUDENT BODY RACIAL AND ETHNIC DEMOGRAPHICS ON COMMUNITY COLLEGE STUDENT PERSISTENCE: A CORRELATIONAL INFERENTIAL STUDY

A DISSERTATION

Submitted in partial fulfillment of the requirements

For the degree of

DOCTOR OF EDUCATION

In

EDUCATIONAL LEADERSHIP

Community College Leadership

By

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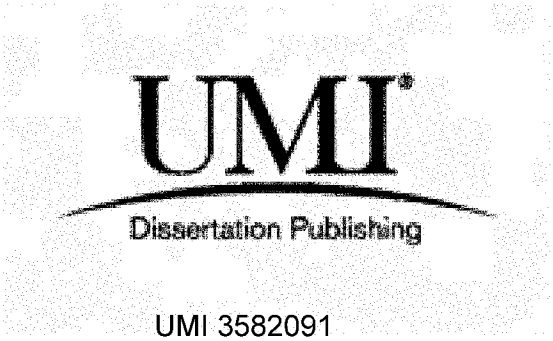
2014



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ABSTRACT

A correlational inferential study of diverse urban community colleges found student engagement and persistence to be influenced by student body racial and ethnic demographics. An omnibus methodology was devised to quantify persistence of students with multifarious goals, allowing existing data about the student outcomes to be examined over the long term, inclusive of full-time and part-time students and those who stop out and return. This study adds to the understanding of peer groups as viewed in college impact models and recommends practices to improve student success.

Among the major findings of the study, student body diversity was found to promote student persistence. Student race or ethnicity was also found to affect persistence contingent upon student body racial and ethnic composition. Asian student persistence did not appear to be affected by the racial and ethnic composition of the colleges they attended. White students experienced a positive effect on persistence at colleges with no predominant population. Hispanic students experienced the greatest negative effect on persistence among all groups when they attended predominantly Hispanic colleges. Black students experienced less negative effects than Hispanics at institutions with predominant populations of Black or Hispanic students than they did when attending colleges with no predominant population.

Student academic preparation and access to financial aid were confirmed as consistent predictors of student persistence. The larger effects of background characteristics and preparation on persistence recommend a greater emphasis on active engagement with students to increase college effects on student persistence.

Racial and ethnic student body demographics did not affect student engagement patterns as strongly as they affected persistence. Higher percentages of Black or Hispanic students in college predicted modest increases in engagement while the percentage of Asian students did not predict engagement. Small differences between the ways in which Asian, Black, Hispanic, and White students engaged were also identified.

The evidence of effects on student outcomes at predominantly minority community colleges necessitates greater understanding of social normative systems to update theoretical models developed for predominantly White four-year institutions. The findings recommend developing educational practices that are sensitive to specific student populations, while also recommending better understanding of within-group differences.

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To my loving wife, Rita Gonzales,

and

to my parents, Shukri and Badia, who drive me still

to the learning that they were denied.

ACKNOWLEDGMENTS

I wish to recognize the generosity of the Los Angeles Community College District for providing unfettered access to the data used in this study. The district's multi-decadal data collection and research program is a treasure trove for academics and practitioners seeking to improve educational practice for diverse student populations.

CHAPTER 1

INTRODUCTION

> Do not zero in on finding the silver bullet. There aren't any. The effects of college are cumulative across a range of activities. (Terenzini, as quoted in CCCSE, 2012, p. 1)

Declining resources, a rapid growth in community college enrollment, and the demand for a better prepared workforce drive policymakers and the public to demand more college access and more effective colleges. Policy pressures being applied include demands for student success data and threats of performance-based funding. In the latter case, some states lean toward adjustments in baseline funding, requiring evidence of improvement just to earn back the original baseline funding (Shulock & Jenkins, 2011).

Yet, community colleges attract the most underprepared students, those from poor school systems, workers in low skill and low wage jobs or who are unemployed, and immigrants with limited English proficiency. These students are the ones who can least afford the time and money required to attend college and are least prepared academically and socially to navigate the requirements of college and succeed in completing courses and programs of study.

To best support the students through completion of their community college studies and to comply with the public demands for greater productivity, it

is important to understand how students engage with their colleges—what keeps them there or what weakens their attachment to their institutions and to their studies. Over the past 50 years, many studies have focused on these issues, yet little is known about how different racial and ethnic student populations at community colleges may influence their college environments and affect the persistence of students whose peers are from the same or different backgrounds and levels of preparation for college.

Background of the Problem

Only about 14% of first time California Community College (CCC) students complete a degree or certificate or transfer to a university within six years (Shulock & Moore, 2007). Further, this low rate is different between students of different racial and ethnic backgrounds. While completion rates for Asian and White students are 33% and 27% respectively, Latino and Black students complete at 18% and 15% due in large part to the lower rates at which the latter two groups transfer to four-year institutions. This is especially problematic for urban community colleges where Black and Latino students are more heavily represented, and for California in general, where Latinos are the fastest growing segment of the population (Shulock & Moore, 2007).

> Approximately one in four degree-seekers in the cohort "completed" – meaning they earned a certificate or degree, transferred to a four-year university, or achieved some combination of those outcomes within six years of enrolling in the CCC. . . . Eighteen percent of degree-seekers transferred to a four-year institution, while an additional six percent earned

> a certificate or an associate degree without transferring. 76% of degree-seekers did not achieve any of these outcomes within six years of enrolling in the CCC. (Shulock & Moore, 2007, p. 8)

The problem of low completion rates in California community colleges reflects a national challenge. Enrollment in higher education continues to grow but success rates are stagnant (Tinto, 2012). College enrollments have climbed from almost nine million in 1980 to almost 20 million in 2011, but completion rates have not improved significantly. If public support is to continue in turbulent economic times, and if community colleges are to fulfill their obligations to community economic development and to student opportunity, persistence and success in college must be better understood and policies crafted to improve them.

For California community colleges, accountability pressures to report and to improve persistence and success rates continue to mount. For example, the Accountability Report for Community Colleges (ARCC) was required by legislative action (AB 1417, 2004). This program requires annual reporting in progress and completion rates in transfer preparation, career and technical education (CTE), and basic skills needed for success in college (California Community Colleges Chancellor's Office, 2007). Similarly, the recently enacted Student Success Taskforce compels programs to increase persistence and completion through a number of prescriptive policies intended to focus California community college efforts on students seeking career and technical education programs, certificates, and transfer preparation (California Community Colleges

Chancellor's Office, 2012). Further legislation implemented in 2012 began to execute elements of the Student Success Taskforce recommendations. The impact of this legislation is illustrated by the pressure on community colleges and students to implement and to participate in placement testing programs, mandatory orientations, and the development of education plans (SB 1456, 2012).

On April 9, 2013, the California Community Colleges Chancellor's Office launched an updated accountability tool, the Student Success Scorecard (California Community Colleges Chancellor's Office, 2013a). This scorecard demonstrates policy-makers' evolving interest in community college accountability. In addition to refining which students to track and over what period of time, the scorecard framework reveals a new interest in how subgroups such as men and women or racial and ethnic groups perform. The scorecard defines how college success is to be examined, but it creates new uncertainties in how to measure the desired outcomes. Like the earlier ARCC, this document tracks student retention, progress, and completion rates at California community colleges. It examines how students advance in remedial or non-credit course sequences, career and technical education degree and certificate completion, associate degree completion, and in transfer to four-year institutions. This scorecard redefines the criteria for the metrics but leaves in place a system of measuring institutional outcomes that track college rates over time. Tracking over time can be used to assess the progress of individual institutions and to compare institutions within the California community college system.

> The scorecard itself . . . measures progress and completion at each college for various groups of student demographics, including those with different levels of college preparation. This will be the core of the framework and part of the report that focuses on the performance of each college and incorporates many of the recommendations from the SSTF [Student Success Taskforce], such as providing metrics pertaining to momentum points, the disaggregation of metrics by racial and ethnic groups and the inclusion of students taking less than 12 units. (California Community Colleges Chancellor's Office, 2013a, pp. 1-2)

This instrument can produce some paradoxical outcomes. Tracking the six-year persistence and completion rates for cohorts starting between the years 2002 and 2006, the first release of this instrument showed some weakness that may arise from how persistence and success are defined. At some institutions, cohorts of well-prepared students appeared to complete degrees or certificates or to transfer at higher rates than they persisted. Nonetheless, by disaggregating students by their demographic groupings, the scorecard demonstrates a policy level demand to study the progress of student subgroups separately.

The connection between persistence and completion, taken as sequential measures of academic success, is underscored by the ARCC, the Student Success Scorecard, and other accountability measures. The distinction between students' persistence in their studies, even if they change colleges, and an individual community college's ability to retain those students is an important matter of definition (Tinto, 2012). Understanding what helps a student to reach

his or her individual goals will help researchers and practitioners better study and interpret persistence and success outcomes. Tinto (2012) proposed that the established linkage between persistence and completion allows for the study of persistence to stand in for success measures. This approach resolves the methodological difficulties in assessing students' achievement of their goals in the real world of community college practice, given the expectation that improved persistence leads to improved completion rates.

It is worthwhile to note that not all policy leaders accept the validity of linking retention and success. For example, O'Banion (2013) emphasized completion as a key measure: "Retention might be more appropriate as a measure for prisons rather than higher education institutions, as it reflects merely the ability to hold someone in place" (p. 4). It is certainly important to distinguish between students' persisting in pursuing their studies toward completing a goal over time from the ability of the institution to retain students who are taking some course work but not necessarily progressing. O'Banion (2013) emphasized that in the second decade of the twenty-first century, the student success agenda being supported by legislators, policy analysts, educators, and business leaders is to double the number of students who either complete at least one-year college certificate programs, earn associate degrees, or transfer to four-year institutions.

Research that is relevant to community college students' experience at college is needed to help improve student success. The increased reliance of society on students who have at least one year of college education (Lay, 2010)

and the gaps in social mobility opportunity for minority students point to the community colleges as the locus of research on student success. The literature on the impact of college on students has focused mostly on four-year institutions and more heavily on traditional age White students (Pascarella & Terenzini, 2005). These well-researched populations differ from the populations attending California community colleges (Cohen & Brawer, 2008). However, four decades of research on college impact suggest educational theory and methodology exist to support new studies that may identify the needs of community college students (Astin, 1993; Bowen, 1977; Feldman & Newcomb, 1969; Pascarella & Terenzini, 2005; Tinto, 1993, 2012). Policy and practice have been developed based on much of this literature to promote best practices at community colleges (California Community Colleges Chancellor's Office, 2012; Center for Community College Student Engagement, 2012). Much of the literature on which community college improvements are premised was developed from research on different student populations. The extent to which this literature effectively supports the unique community college populations has not been demonstrated.

Urban California community colleges serve high proportions of minority and immigrant student and non-traditional-age students. For example, in the 2010-2011 academic year, only 16% of the 241,000 students served by the Los Angeles Community College District identified themselves as White, non-Hispanic. In the San Diego Community College District the proportion of White students was twice as high, but still only 35% of 132,000 students. Similarly, in the Los Rios Community College District in the Sacramento area, the proportion

of White students was 37%. In the San Francisco Community College District of 90,000 students, 19% were White and in the San Jose Community College District only 13% of 32,000 students were White (Community Colleges Chancellor's Office, 2013b).

Renewed policy-driven interest in how student demographic groups persist and succeed or fail to complete educational goals was demonstrated in the new emphasis of the Student Success Scorecard. How community colleges affect students from different demographic groups, and how these students engage with their colleges may be different from how four-year universities affect traditional students. So questions of engagement, persistence, and success that may have been answered for university students in the past four decades of university-based college impact research must now be answered for the highly diverse populations who attend community colleges (Pascarella & Terenzini, 2005).

Moreover, student engagement is known to improve persistence and success (Astin, 1993; Kuh, Kinzie, Schuh, & Whitt, 2010; Tinto, 1993). So policies and practices that encourage the engagement and persistence of community college students must also account for how the students behave in the context of the unique student population of the college they attend. Weidman (1989) noted that research on college impact should focus on the socializing effects of the social structure of colleges in addition to the factors that other college impact theorists have addressed such as student background characteristics and academic structures (Astin, 1984; 1993; Tinto, 1993;

Pascarella & Terenzini, 2005). Weidman's (1989) model accounts for the socializing effects of sub-environments created by student groups themselves. These effects, referred to as normative influences of peer groups, emphasize the socialization effects from social and academic interactions with student peers. By studying the effects of student body composition on student engagement in social and academic environments, colleges can identify policies and practices that encourage student engagement, persistence, and success.

Problem Statement

Policy-makers are increasingly scrutinizing the dramatic differences in community college student success among demographic groups (California Community Colleges Chancellor's Office, 2013a; Shulock & Jenkins, 2011). Black and Latino students can be twice as likely to fail to complete college programs as Asian or White students in California community colleges (Shulock & Moore, 2007). Low student success rates precipitate reduced economic opportunity for these students and their communities. This problem perpetuates cycles of poverty and underdevelopment in economic ghettos in otherwise prosperous cities and regions, with attendant increases in despair, violence, and incarceration of otherwise able citizens.

Historically, policy and practice related to community college student success have relied heavily on college impact models of student development. Yet these models were produced from research on university students who are different from community college students. This research was typically conducted at institutions that are less diverse in demographics and college

readiness from urban community colleges (Pascarella & Terenzini, 2005). These student development models posit strong links between academic success and the social engagement of students in their institutions (Pascarella, 1985; Tinto, 1993; Weidman, 1989), but they do not explain sufficiently the disparities between racial and ethnic student groups and may fail to acknowledge the complexity of the social composition of socially, economically, and academically diverse colleges. These theoretical models, and the research used to develop and refine them, have rather focused on controlling for the background characteristics of individual students, and have treated the college environment as an internal constant (Astin, 1991). Seminal research on differences between social or structural systems has tended to examine inter-institutional differences (Astin, 1993; Pascarella & Terenzini, 1991; 2005), but it has paid little attention to the different environments that can emerge for social and historical reasons when large proportions of different groups comprise a student body.

Norms develop in social systems (Horne, 2001). In college environments social norms are known to influence student learning. For example, Braxton and Caboni (2005) recommended that colleges assess student peer group norms to improve the fit of college policies to these norms and to improve the success of students' college experiences. Research on university and community college students has confirmed the existence of normative structures with which student communities regulate their peer group attitudes and behaviors and developed frameworks that describe them (Akin, 2010; Caboni et al., 2005). Both Akin (2010) and Caboni et al. (2005) identified differences between social norms

among White and non-White students that may influence how they engage with their community colleges and universities. However, that research was conducted on colleges with large majorities of White students, which necessitated aggregating all other groups. Aggregating demographic groups obscures differences between the non-White groups. Other research indicates that the demographic composition of community college student bodies may influence how they engage with the institution and succeed (Bahr, 2008). Since non-White groups comprise the majority of students in many diverse, urban community colleges, the results of research conducted by aggregating non-White groups may not reflect the community college experience in the target colleges.

The problem that this study addressed was that the social norms that motivate students from different racial and ethnic groups to engage, persist, and succeed in college are not understood in the context of the different social environments that may comprise a racially and ethnically diverse community college. Current theory does not address the variability of the environments within which students engage with their institutions as a structural characteristic. Therefore the environments cannot be described either as a function of the racial and ethnic student groups that come to the college or as a function of historical social structures that may have emerged locally and may be peculiar to any particular college. Educational practitioners do not have models that describe or confirm how the student normative environment is structured in colleges that have non-White student populations that are large and diverse.

Purpose Statement

In this research study, I examined the influences of community college student body racial and ethnic composition on academic and social engagement of students and on student persistence. I explored these effects at multiple community colleges with diverse and varied student bodies. At each community college that was included in the study large subpopulations were examined as potential normative student environments for that institution.

The study examined nine urban California community colleges that are part of the same college district. The colleges shared similar structural characteristics but differing racial and ethnic student body compositions. Data from an existing survey of student academic and social activities conducted at the nine colleges were used to explore differential effects of student body composition on students. Linear multiple regression analysis was employed to measure the effects of the size of student body subpopulations on student engagement and persistence. The multiple regression methodology also controlled for (a) individual students' background and preparation and (b) the diversity of college preparation that exists within racial and ethnic groups in colleges in terms of socio-economic status, immigrant status, familial college-going history, and college-readiness.

Theoretical constructs from Astin's (1984) Theory of Involvement, Pascarella's (1985) General Model for Assessing Change, and Weidman's (1989) Model of Undergraduate Socialization framed the study. Astin's (1991) Input-Environment-Output (I-E-O) assessment model was used as the analytical

framework for a multiple regression statistical analysis. In particular, Weidman's Conceptual Model of Undergraduate Socialization was used to assess the effects of differential institutional and student environments on student learning and cognitive development (see Figure 1). In this study, it was used to select student characteristics to be controlled. Pascarella's (1985) model also framed the interactions between the students and their colleges that were assumed to influence the environmental impact on student development.

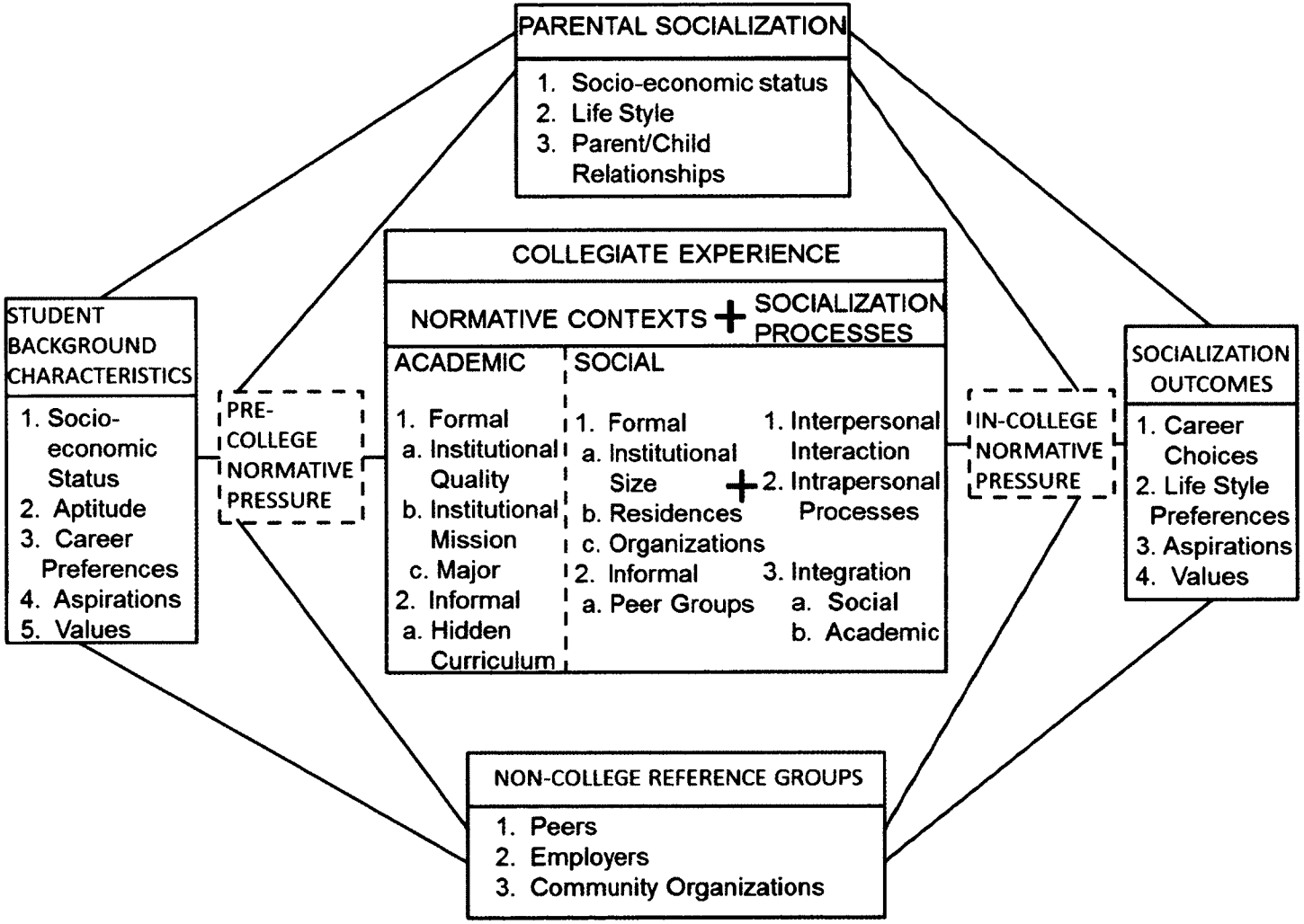

Figure 1. Weidman's Conceptual Model for Undergraduate Socialization.
Adapted from "Undergraduate Socialization: A Conceptual Approach," by J. Weidman, 1989, in J. Smart (Ed.), *Higher Education: Handbook of Theory and Research*, vol. 5, pp. 289-322. Copyright 1989 by Agathon.

Student engagement and psychometric data analyzed in this study were previously collected in a survey conducted uniformly at the nine colleges in the study. These data were tied to student records and other systematically collected institutional data. The comprehensive data set ensured that Astin's complete I-E-O assessment model could be applied to control student input characteristics and to predict the effects of learning environments on educational outcomes.

Research Questions

The following research questions focused on California community college student engagement practices and persistence outcomes among racially and ethnically diverse urban and suburban students. These students were assumed to be influenced by normative environments tied to racial and ethnic student population composition.

1. What is the effect of racial and ethnic community college student body composition on student persistence?
2. Does the racial and ethnic composition of a community college's student body have differential effects on the persistence of students from different racial and ethnic groups?
3. What is the effect of racial and ethnic student body composition on student academic and social engagement?

Significance of the Study

Findings related to how students are affected by normative pressures from their peer groups in social and academic environments will allow colleges to

focus limited resources on programs that will improve persistence and success. Studying the effects of racial and ethnic student demographics on persistence will also support policy-makers and practitioners in making decisions specific to those students' experiences as they differ from one college environment to another. This is especially important in urban, racially and ethnically diverse colleges that have peer groups who are diverse mixes of race and ethnicity, educational tradition, and preparation. The study tested the applicability of higher educational research, theory, and models of practice to minority-serving institutions by beginning to distinguish the effects of the specific student population mix as a factor in how students engage each other and influence each other when they come from the same group and from different groups. Specifically, this study helped to identify the effects that these diverse peer environments have on how students engage with college and peers and how the students persist in attending college.

The methodology used in the study contributes two significant innovations in the study of community college student persistence. First, controlling for student background characteristics, the study isolates the effects of college environments on students as induced by normative effects of various peer groups. Secondly, by studying the persistence behaviors of a large sample of students at a number of diverse urban and suburban colleges over the entire academic career of each student, the study measures actual persistence behaviors of these students regardless of any terms of study when students may have stopped out. It expands the definition and study of persistence beyond

traditional first-year experiences while studying with greater nuance the actual behaviors of students who persist within a six-year span of course-taking.

Scope of the Study

The focus of this study is the effect of the racial and ethnic student body composition at urban and suburban community colleges on student persistence. The study focuses on identifying effects of student body composition on observed student behaviors, specifically engagement and persistence in attending college, between student groups, and between colleges with different student body compositions. It seeks to identify the presence of effects, but will not describe cultural or organizational attributes that contribute to these outcomes.

Assumptions

This research study relied on pre-existing survey data on student characteristics and practices collected in spring 2007 by the colleges in the study as part of ongoing institutional research. Data on the persistence of individual students who participated in the survey spanned the period from fall 2001 to fall 2012. This study assumed that the survey data collected were random and that responses were collected from the participating colleges in a uniform fashion. As the survey was pre-existing, the variables selected to describe student background characteristics and preparation and those intended to describe student engagement in college were assumed to sufficiently explain variance in the multiple regression analysis to indicate predictive factors that distinguish the effects of different educational environments on student persistence. While it is

possible that the variables available for the study were not sufficient to predict student engagement and persistence, the results of negative findings would merely fail to explain variance in a significant fashion and are unlikely to indicate false positive predictors of engagement and persistence.

Delimitations

This study focused on identifying complex internal college effects on student engagement and persistence caused by prevailing cultural norms that were influenced by the racial and ethnic composition of each college in the study. The methodology controlled for individual student socio-economic background characteristics to minimize the effect of input characteristics on outcomes, but the study did not focus on those input characteristics.

The study did not attempt to examine the effects of the college environment on goal completion or on academic achievement. Instead it used as an outcome measure a hybrid measure of persistence comprised of attendance and course taking. Additionally, while traditional factors known to affect persistence, such as financial ability, college preparation, prior academic experience, and familial educational history, were controlled for as input characteristics, they were outside the boundaries of this study.

Limitations

The study did not examine interactions of student population mixes with faculty and staff characteristics. Such information was not available and a superficial examination of the racial/ethnic composition of college employee

groups was considered insufficient to supplement the analysis of the student social environment.

Data describing each institution's culture and structure were not available in the student survey. Consequently the study did not include variables that distinguished the academic environments of the colleges. In the absence of this information, the variability between institutions could not be controlled for statistically. The study design relied on limiting inter-institutional structural variation by selecting colleges in the same district that shared policy, structural characteristics, and regional consistency in employee pools.

Student data, including the tracking of student persistence, were limited to records of the college district in the study. In this study, students who left to attend other community college districts appeared to have not persisted. This means that the measures of student persistence were conservative measures in addressing the full construct.

Student educational goals, collected with students' initial applications, are often unreliable indicators of the goals students actually pursue once they have been exposed to the college experience. It becomes more difficult to define persistence toward uncertain goals. The data available and methodology used for this study did not account for students developing higher aspirations once they were exposed to collegiate studies or for students lessening their goals because of challenges, costs, and the rigors of balancing study and life demands.

Definitions of Key Terms

This study relied on a consistent definition of the following two sets of terms. The first set of terms address central measures utilized in this study, and the second set of terms are terms related to the racial and ethnic classifications used in the study.

Terms Related to Study Measures

Longevity. McClenney and Marti (2006) defined longevity as "the number of terms enrolled and total hours completed" (p. 82). They found this hybrid of academics and persistence to be correlated with engagement factors.

Normative environment. A norm is a rule, standard of behavior, or conception. Students feel "pressured to conform to the actions and conceptions of the groups of people to which the individual belongs and with whom the individual interacts" (Ethington, 2000, p. 705). Norms develop in a student peer group as a result of academic and social experiences structured by the institution (Ethington, 2000) or as a stable reflection of aggregated student characteristics (Pascarella & Terenzini, 2005). The latter human aggregate approach allows more readily for multiple peer groups and different environmental experiences for students with different background characteristics.

Persistence. Noting that persistence "can legitimately be considered a necessary, if not sufficient, condition for degree attainment" (p.370), Pascarella and Terenzini (p. 370) defined persistence as "the progressive reenrollment in college, whether continuous from one term to the next or temporarily interrupted then resumed" (p. 374). This broad definition is suitable for community college

students who often attend part-time and intermittently. This definition is in line with the standard used in the official California Community College Chancellor's Office ARCC measures of progress that includes tracking the percentage of first-time students who have earned a minimum of 12 units who attempt a degree, certificate, or transfer level course within 6 years of beginning their studies (California Community Colleges Chancellor's Office, 2007).

Racial and ethnic groups. Fernandes Williams (2013) argued for a continuum between real and nominal racial categorization. She observed that social forces such as labels, institutions, laws, values, and traditions enforce these categories where individual and communal identities are more complex. Nonetheless, notable differences exist between various racial and ethnic groups in terms of socioeconomic background, college attendance, and performance and, therefore, justifies studying these groups as cohorts (Cohen & Brawer, 2008).

Student engagement. Student engagement has been described as a class of practices intended to improve student persistence and success. Chickering and Gamson (1987) outlined seven principles of good practice that provide an umbrella framework for student engagement. These principles encourage student-faculty contact, cooperation among students, active learning practices, prompt feedback especially from faculty, emphasis on time on task, communicating high expectations, and respecting diverse talents and ways of learning. Tinto (1993) described both academic and social engagement as elements critical to college student persistence, and Kuh, Kinzie, Schuh, and

Whitt (2010) added inclusive and affirming institutional environments as an important element to student learning.

Racial and Ethnic Classification Terms

Asian. Asian students and populations in this study include the sub-populations of East Asia, South-East Asia, and South Asia. The population and sample may also include small numbers of Pacific Islanders and Central Asians.

Black. I use the term Black consistently to refer to African Americans, Sub-Saharan African immigrants, and immigrants from the Caribbean and other areas who identify as Black or African American. Black is intended as both an overarching term and a reflection of increasingly common usage in the early twenty-first century (Spring, 2012). Where I refer specifically to native populations or historical communities, I use the term African American.

Latino/Latina. As an acknowledgement of the social construction of the term Hispanic and a reflection of preference for a term that describes commonalities of interests, I use Latino or Latina to refer to individuals or populations whose ethnic roots come from Latin American traditions. Hispanic is used to refer to the sample of students in the data, and in reference to study findings that used that data set, as that is the classification used to gather and store the data in conformance with US Census Bureau practice.

Latino, as a special use of the Spanish word Latinoamericano, was adopted by various Latin American groups in the United States to reflect common issues and interests in the early 1970s. The term was intended to describe a coalition not an ethnic identity. The term Hispanic, conversely, was imposed by

the media and federal government to replace the term Spanish-American as it fell out of use (Calderon, 1992). As an example, my wife, whose father's ancestors emigrated separately from Spain and Mexico to the western United States several generations ago is classified as Hispanic in some official records but rejects that term in favor of Latina. My wife acknowledges equally the influences of her mother's German, French, Scottish and Welsh ancestors who settled originally in antebellum Minnesota and Kentucky.

White. In referring to White students, this study includes both historical American populations that immigrated mostly from Europe and others self-identifying as White. These include those Latin Americans who do not identify as Hispanic, Latino, or Chicano as well as more recent large numbers of immigrants from Eastern Europe, the Middle-East, and North Africa who are classified by the U.S. Census Bureau (2001) as White non-Hispanic. Available data will indicate recent immigrant status of students but not countries of origin of recent immigrants. I, an adult immigrant from the Middle-East, typically self-identify and am identified formally as White non-Hispanic.

Organization of the Dissertation

In Chapter 1, I have described regulatory pressures on California community colleges to increase student completion rates. New reporting criteria sharpen the focus on the dramatically different completion rates between members of different racial and ethnic groups.

Referencing the literature connecting success in college to student engagement and persistence, I have identified a reliance in higher education

research and policy development on college impact models developed at four-year institutions that serve students from comparatively uniform populations when considering academic preparation or socio-economic background. These models consider student peer groups to be uniform across each institution and neglect the potential effects of multiple peer groups or normative systems on the engagement, persistence, and success of the large subpopulations found in urban and suburban community colleges.

In Chapter 2, I review the literature on student engagement and persistence. In Chapter 3, I detail the study framework, methods, and sources of data. In Chapter 4, I present the results of the analysis. In Chapter 5, I discuss the conclusions of the study and their applicability to policy and educational practice in community colleges.

CHAPTER 2

REVIEW OF THE LITERATURE

Twenty-first century American society is placing high demands on colleges and universities to produce well-prepared graduates who will contribute to society's economic well being (Carnevale, Strohl, & Smith, 2009; Lay, 2010; U.S. Department of Education, 2006). An equally insistent demand on higher education, especially on community colleges, which serve disproportionately large historically underserved populations, is to contribute to social mobility among minority populations that have not historically benefited as much from higher education as other groups (Cohen & Brawer, 2008; Shulock & Moore, 2007). If community colleges are to contribute effectively to both economic development and social justice agendas, they must better understand and mitigate the factors that contribute to the large disparities in persistence and program completion between racial and ethnic groups attending community colleges (Braswell et al., 2001; Grigg, Daane, Jin, & Campbell, 2003; Venezia, Kirst, & Antonio, 2003).

While there is extensive research on how college affects students, there are gaps in the research on the social influences of student peer groups on student success. Over the past five decades, education researchers have accumulated a large body of literature on the effects of student engagement with instructional and student services and with student peer groups as mechanisms

to guide students to succeed in college (Astin, 1984; Braxton, Hirschy, & McClendon, 2004; Kuh, Kinzie, Schuh, & Whitt, 2010; McClenney, 2007; Newcomb & Wilson,1966 ; Pace, 1984; Pascarella & Terenzini, 1991; Tinto, 1975). Some researchers have identified variations in student engagement by control and selectivity of higher education institutions–public or private institutions and selective or open access colleges and universities–(Pike & Kuh, 2005), while others have described social normative mechanisms by which these variations are maintained (Braxton & Caboni, 2005). In spite of the recognized effects of peer groups from extensive research on college impacts on student development (Astin, 1993, Pascarella & Terenzini, 1991; 2005), little empirical research has been conducted to describe normative structures among peer groups that perpetuate engagement patterns among different student populations (Caboni et al., 2005). Community college student populations can be highly diverse in race and ethnicity, background, and preparation (Cohen & Brawer, 2008; Pascarella & Terenzini, 2005), yet empirical research on the influence of social norms among peer groups on student engagement at these institutions has been limited as well (Akin, 2010). This research study assessed the effects of the presence of diverse racial and ethnic student populations at community colleges on student engagement behaviors and persistence outcomes in order to advance theory and practice in community college effectiveness.

Theoretical Framework

The theoretical foundation for this study is based on assessing effects of the socializing influences of college environments on the development of

students. Because of the theoretical accommodation of peer groups and social normative pressures, Weidman's (1989) Conceptual Model of Undergraduate Socialization shown previously in Figure 1 provides a framework for the literature reviewed in this chapter and undergirds the research methodology. In this review of the literature, first, I situate Weidman's model in the context of college impact literature. The scholarly literature reviewed after that is grouped into the following sections in alignment with college impact models in general and Weidman's model in particular: effects of student background; familial and non-collegiate peer influences; effects of college environment; social normative environmental influences; and developing student college persistence as an outcome of student background and college environmental and normative pressures.

College Impact Models

Pascarella and Terenzini (1991; 2005) distinguished two families of models of student development: developmental theories and college Impact models. First, developmental theories are dominated by psychological theories of stages of development (psychosocial, cognitive-structural, typological, and person-environment interaction models). Second, college impact models of student change include the following: (a) Tinto's Theory of Student Departure (1975, 1988, 1993), a longitudinal model of the interactions between students and the structures and members of the institution that support or undermine academic and social integration in the institution and influence student attrition; (b) Pascarella's General Model for Assessing Change (1985), wherein student

change is brought on by the interactions of student characteristics, interactions with socializing agents at college, and the quality of student effort; and (c) Weidman's Model of Undergraduate Socialization (1989), which combines both psychological influences and the effects of the social structure.

While the emphasis in these and other college impact models may vary, empirical research based on these longitudinal models is organized conceptually by Astin's (1991) Input-Environment-Outcome (I-E-O) model. According to this model, research on the effects of college on students must account for the characteristics and experiences that students bring with them to college (Inputs), because these inputs affect how students are impacted by the experiences and settings to which they are exposed during college (Environment). The result of the interaction between student inputs and the college environment leads to changes in the exiting characteristics or achievements of students at the end of their time in that environment (Outcomes). Astin asserted that complete models of research on college impacts must include all three elements. Astin's I-E-O model is based on two additional precepts: Research must be longitudinal to allow for the effects of student engagement with the elements of the environment and intensity of individual effort to influence change, and research must be multi-institutional to discern the effects of exposure to different environments on a common student outcome after controlling for student entering characteristics. The I-E-O model lends itself to quantitative research utilizing large data sets necessary for inferential, predictive analytical tools.

Student Entering Characteristics

Individual students' knowledge about college, academic preparation, readiness to engage with the various academic and social elements of the institution, and maturity are a large array of characteristics that will affect the college experience. Of particular relevance to this study on the experiences of students in community colleges with large populations of students from racially and ethnically diverse backgrounds are knowledge about college prior to entering higher education, college-going aspirations, family's educational history, and individual academic preparation.

Research over the past 25 years has shown the importance of helping students to develop knowledge and understanding of the college system. From a theoretical stance, early models such as Bourdieu's (1977) sociological model and Attinasi's (1989) interactionist model create a foundation for research and development of practices on what practitioners refer to as *college knowledge*. Several studies have focused on students' attitudes about college, such as internalized stereotypes (e.g., Walpole et al., 2005) and developing college-going aspirations (Attinasi, 1989; Choy, Horn, Nunez, & Chen, 2000). Other studies have focused on the effectiveness of pre-college outreach programs (Engle, Bermeo, & O'Brien, 2006). Review of these studies emphasizes the significance of student background characteristics to the study of student engagement and persistence in racially and ethnically diverse urban community colleges where students' college experiences will be influenced by institutional characteristics..

Knowledge about college. Prospective first-generation and minority students face challenges in developing college-going aspirations and in preparing for college. In a synthesis of the research on college knowledge, the information needed to prepare for and gain admission to college, Vargas (2004) found that traditionally underrepresented students—first-generation, low-income, and minority students—lack information in several key areas. For example, the students and their parents do not possess the knowledge required for academic preparation for college, and they typically attend schools where guidance on proper academic preparation is lacking. These students also do not have access to information about selecting and applying to colleges that fit their academic needs and lack information on financing higher education.

Walpole et al. (2005) explored student perceptions of entrance examinations and persistent score gaps by race and ethnicity. They conducted individual interviews and focus groups with 227 African American and Latino high school juniors and seniors. The researchers used Bourdieu's (1977) sociological perspective on differentiation in education to explore cultural capital (knowledge held within a social group), and habitus (strategies and perceptions of what are possible and appropriate actions as perceived by those in the same social class) as an interpretive framework for investigating students' attitudes and approaches to college entrance exams. The findings of the study included internalized stereotypes of test bias by African American and Latino students. These students attend college at disproportionately lower rates despite psychometric validation that shows that the tests are equitable. Many African American and

Latino students from lower socio-economic status (SES) attend public schools that may lack information about preparation for college, college admissions test strategies, and college financial aid. These students have parents who may have not attended college themselves and therefore cannot pass on this information. By focusing on college entrance examinations this study excluded community college aspirations since community colleges are typically non-selective. While the study by Walpole et al. (2005) is appropriate for the stated purpose of the study because cultural capital and habitus, which correlate with SES, show the importance of this research on student success in college, there is a considerable gap in the research about academic preparation and the development of college aspirations that include starting at, or studying exclusively at, community colleges..

College aspirations. Research identifies the need for effective practices that encourage early aspirational development. In an ethnographic, interview-based study of the processes by which first- and second-generation Chicano students became prepared to go to, and persist in college, Attinasi (1989) introduced as a framework for student matriculation the sociological concept of symbolic interactionism. "It is from the interaction of the individual with others that the meanings of things arise, and it is on the basis of their meaning that the individual acts toward things" (p. 251). Specifically, he focused on anticipatory socialization as a process whereby individuals take on and identify with the attitudes and behaviors of the group they wish to join. Anticipatory socialization assists people in acquiring membership in a new group and adjusting to it.

Attinasi identified practices such as motivation by family and persistent anticipatory statements at school for creating students' expectation of going to college, and early tours and college experiences prior to matriculation as practices that help to ease their eventual transition.

While there are barriers to students developing college knowledge, research shows that effective practices have been developed which can drive equity policy and practice. For example, a qualitative study was conducted using focus groups with 135 first-generation students at two-year and four-year colleges in Texas who had participated in pre-college Talent Search and Upward Bound programs. The study concluded that early and persistent outreach to students and their families about going to college and on the means to pay for college helped to raise students' and families' aspirations for college and readiness for the social transition. Assistance with the admissions processes and academic preparation was also found to facilitate a successful academic transition (Engle, Bermeo, & O'Brien, 2006).

Family's educational history. First-generation students have been found to have similar characteristics to at-risk students and to benefit from similar interventions. Choy et al.(2000) published a synthesis of quantitative studies based on the National Educational Longitudinal Study of 1988 (NELS) that followed students through high school and college admissions. This large nationally representative study focused on the admission to four-year colleges of students with family background and school experiences that put them at risk of

not graduating from high school and on students whose parents did not attend college—first-generation students.

Choy et al. (2000) showed that by 1994 about one half of the students with any risk factors who had developed college aspirations by tenth grade actually attended college. In contrast three quarters of the students with no risk factors attended college. First-generation students had college attendance rates that were comparable to students with moderate risk factors. Choy et al. (2000) also conducted a logistic regression analysis that examined the effects of student engagement and preparation for college that controlled for the risk factors and students' achievement. This analysis indicated that peer group effect was the strongest predictor of going to college. Students with moderate to high risk factors were four times as likely to attend college if most of their peers planned to go to college. Regularly discussing school matters with parents also predicted twice the probability of going to college. Similarly participating in college preparation activities predicted twice the likelihood of attending college.

Academic preparation among first-generation students. Research is available on the effect of academic preparation on attending college. In a multivariate regression analysis, Horn and Nunez (2000) found that students who took algebra in eighth grade were more likely to take advanced math in high school and to attend college. First-generation students were similar to second-generation students and were likely to attend college if they completed advanced math in high school, but first-generation students were found to be less likely to follow this curricular path.

Effects of College Environment

While various models may place different emphasis on student background characteristics and experiences and predict various outcomes, they typically examine the engagement of students with formal and informal teaching and learning opportunities both inside and outside the classroom and with socializing forces exerted by the institution, peer groups, and entities external to the institution. In this section, I review relevant research on student engagement and engagement as an institutional characteristic. I also introduce research on the engagement of different student sub-populations, specifically students from traditionally underserved populations.

Theoretical foundations of research on student engagement began with Pace (1984), who focused his seminal work on student effort and the quality of the student experience. In complementary fashion, Astin's Theory of Involvement (1984, 1993) reoriented the college impact model to the student's perspective. Subsequently, Chickering and Gamson (1987, 1999) outlined seven principles of good practice that provide an umbrella framework that informs current institutional efforts to encourage student engagement. These principles encourage student-faculty contact; cooperation among students; active learning practices; prompt feedback, especially from faculty; emphasis on time on task, communicating high expectations; and respecting diverse talents and ways of learning.

In addition, because researchers have validated strong links between student engagement and success measures (McClenney, 2007), considerable

academic research has been conducted on student engagement. Referring to student engagement, Hayek and Kuh (2004) emphasized that "what matters more to success in the first year is what students actually do, not what institutions have in terms of resources, such as facilities and faculty credentials" (p. 11). However, researchers have primarily focused on four-year colleges and universities, not community colleges.

Marti (2008) asserted that persistence in two-year colleges has been studied with models developed for four-year institutions. For example, Braxton, Hirschy, and McClendon (2004) noted differences in the empirical support for Tinto's Theory of Student Departure between community colleges and four-year institutions. Pascarella (1997) acknowledged that no more than 5% of approximately 2,600 studies reviewed in their influential text, *How College Affects Students* (Pascarella & Terenzini, 1991), focused on community colleges. In updating their seminal work on research in higher education, Pascarella and Terenzini (2005) identified five directions in which the study of college impact on students has changed since their review of the college impact literature of the 1970s and 1980s. The first direction identified by Pascarella and Terenzini points to changes in who is being studied. Increasingly diverse students are being studied. Traditional-aged White undergraduates who attend four-year institutions full-time, reside on campus, do not have to work or bear family responsibilities are still studied; however, there is increasing research interest in how diverse students benefit conditionally from the same environment—these newly studied students have distinct experiences that are correlated with their

own backgrounds as well as the characteristics of the college experience. This is labeled an interaction effect. Second, researchers have broadened their interest in where students study. Starting in the 1990s, educational literature has addressed diverse institutional types, especially community colleges, where both enrollments and diversity have grown the fastest (Callan, 1997; Cohen & Brawer, 2008). Third, views on how students learn have changed. Research since the 1990s has acknowledged the importance of a constructivist view of student learning and the pedagogies that go along with that educational worldview. This epistemological approach substitutes prior perceptions of learning as knowledge acquisition with a view of learning as active construction of knowledge by the learner through interactions with the environment, teachers, and fellow learners. Fourth, there have been changes in policy considerations. Changing demographics and increasing access to higher education, declining resources, and technological advances are increasingly the motivators and subjects of educational research. Fifth, there has been a diversification of research methodologies. While "the positivist, quantitative paradigm still dominates" (Pascarella & Terenzini, 2005, p. 4), qualitative research has increasingly contributed to the understanding of college impact.

Student engagement. Focusing on how community college student engagement may be distinct from four-year institutions, Marti (2008) developed a typology of community college attendance (or persistence) pathways using trend analysis semi-parametric statistical methodology to identify latent trajectory groups. These are discrete groups of participants whose course-taking patterns

are distinct and are not well-represented by traditional regression and ANOVA parametric studies that focus on statistical central tendencies that presume a homogeneous group with common characteristics.

Using the Community College Student Report survey (CCSR) administered by the Community College Survey of Student Engagement (CCSSE), Marti (2008) identified five latent trajectory groups that emerged consistently in databases from the Florida Department of Education Community College Database, Hispanic Serving Institutions and members of the Hispanic Association of Colleges and Universities, and Achieving the Dream colleges. The trajectories were descriptively labeled full-time, long-term (students who attend long term regardless of completion); 2 years and out (students who complete their studies in a traditional two-year patter), long-term decliners (students whose course-taking pattern declines over time but do not necessarily drop out), part-time, long-term (students who attend part-time over many terms and may stop out and return); and one term and out (students who do not persist past their first term). The findings affirmed a strong association between measures of student engagement and efficient course-taking pathways—those that lead to program completion and/or transfer to four-year institutions in a pattern that is close to the traditional two-year full-time program. Marti also concluded that the standard three-year policy-driven period used to assess completion may not reflect properly the actual behavior of students and, therefore, may artificially lower meaningful reports of completion rates.

In a similar finding, Chickering and Gamson (1997) noted that "Kuh, Pace, and Vesper (1997) found that faculty-student contact, cooperation among students, and active learning were the best predictors of student educational gains in college" (p. 80). In fact, Kuh, Pace, and Vesper (1997) developed process indicators or measures of observable behaviors as an easier, less costly alternative to student outcomes assessment data. They based their process indicators on three of Chickering and Gamson's (1987) seven principles for good practice: student-faculty contact, cooperation among students, and active learning. As these process indicators are action oriented, they postulated that these measures could be used to guide policy development. Kuh, Pace, and Vesper examined the responses of 5,466 undergraduates at a variety of four-year institutions on the College Student Experience Questionnaire (CSEQ) using ordinary least squares (OLS) linear regression analysis. The researchers concluded that active learning and cooperation among students predicted gains in general education and in intellectual skills composite factors. This was true for men and women at baccalaureate, master's granting, and doctoral granting institutions. The early application of process indicators in this study found only a small association between academic gains and faculty-student interactions and only at master's granting institutions. They did not find that student background characteristics had a significant influence on educational gains. This effort predated the launch of the National Survey of Student Engagement (NSSE) in 1998, which was led by some of the same researchers.

In a synthesis of the data taken from a five-year administration of a large, multi-institutional study of student engagement using the Community College Survey of Student Engagement (CCSSE) and data from a three-year administration of the Community College Faculty Survey of Student Engagement (CCFSSE), McClenney (2007) reported several important findings on student learning. CCSSE assesses five measures of effective practice: (a) student engagement in active and collaborative learning; (b) level of educational efforts; (c) level of academic challenge experienced; (d) student-faculty interaction in and out of class; and (e) student support practices and usage. The most significant of McClenney's (2007) findings is the confirmation using a large, national study that student engagement is a valid proxy for student persistence and academic achievement. The strongest influence on persistence and success came from active and cooperative learning, and engagement with faculty. High-risk students who were highly engaged were found to persist in community college. Cautionary findings for which policy and practice can be implemented included that part-time students are less likely to be engaged even in in-class activities, and faculty perceive a much higher degree of faculty-student engagement than students do. Along these lines, Akin (2009) described the organizational challenges at one community college of involving the faculty, staff, and administrators in improving student engagement. At this institution, four of five student engagement scores actually dropped on the CCSSE after an initially unsuccessful launch of an engagement initiative.

According to Marti (2009), the CCSSE shows a strong effect of student academic engagement activities on student success. Based on his analysis, Marti suggested that the lack of effect of student engagement with student services on GPA found in the CCSSE data may be because student services had no effect on measures of cognitive learning and because student services may be used by students with special needs whose academic performance is typically lower.

Engagement of traditionally underserved students. Historically research has focused on four-year institutions and traditional aged, White, residential students (Pascarella & Terenzini, 2005). As the research focus has shifted to community colleges, previously neglected student populations are being studied. However, there is limited research that addresses how non-White students engage and benefit from their engagement in different kinds of institutions.

Different effects of academic engagement on students by race and ethnicity have been identified in large scale studies (McClenney & Marti, 2006), but were not conclusive. In a study of 1,623 students at 24 colleges participating in the Achieving the Dream initiative, Black and Latino students engaged in significantly different ways on the five CCSSE benchmarks of engagement: active and collaborative learning, student effort, academic challenge, student-faculty interaction, and support for learners. Black students were found to be more engaged than White students in student effort, academic challenge, and support for learners measures. Hispanic students were found to be more

engaged than White student in two of these measures, student effort and support for learners.

Likewise, in CCSSE surveys of 4,823 students in Florida Community College System institutions, some statistically significant conditional effects for race and ethnicity were also identified. For example active and collaborative learning had different but greater effects on credit completion rates of Black and Latino students than on White students. Conversely, the study showed different but negative effects of support for learners engagement on the GPAs of Black and Hispanic students while it had a neutral effect on White students' GPAs. Race and ethnicity were not found to have conditional effects on persistence or degree completion in this study. Conditional effects by race and ethnicity were nonetheless ambiguous:

> Generally, it appears that groups that are traditionally disadvantaged have higher levels of engagement; this pattern is true for racial minorities, immigrants, and low-income students. The conditional effects for race/ethnicity reported in the Florida study were consistently sparse, and the effects that emerged as significant were inconsistent. While each interaction effect would take individual consideration to understand, the more notable fact was that race/ethnicity did not appear to consistently interact with CCSSE measures. In combination with results demonstrating that minorities typically have higher levels of engagement, this pattern suggests that the strength of the relationship between engagement and

> putative outcome measures was not typically different to a large degree based on race/ethnicity. (McClenney & Marti, 2006, pp. 84-85).

McClenney and Marti (2006) concluded that academic areas of engagement were most closely associated with academic outcomes such as GPA, degree completion, and attainment of academic milestones. Retention measures, such as student persistence to a second semester or to a second year, were found to be more closely associated with learning support services, student services, and collaborative learning. As a practical outcome measure, longevity, "the number of terms enrolled and total hours completed" (McClenney & Marti, 2006, p. 82), was found to be a hybrid of academics and persistence and was found to be correlated with engagement factors as well.

While these studies provided a useful conceptualization of a hybrid persistence and progress outcome measure and identified differences the engagement of Black, Latino, and White students, they failed to produce consistent measurements of minority student engagement in the different CCSSE measures. The studies focused on the students' individual racial or ethnic attributes, but treated the environments in which they engaged as a constant across many institutions. This leaves unanswered the question of whether all Black or Latino students behave the same as a cohort, even when controlling for their individual background characteristics. It does not examine if the engagement behaviors of individual minority students interact with unique attributes or institution-specific characteristics of their peer groups caused by the composition, history, or traditions held by the peer groups at each institution.

Engagement as an institutional characteristic. Research on student engagement shows the existence of student engagement profiles that differ based not only on institutional characteristics but also among institutions of the same type. Based on responses from a large sample of college seniors selected from the 2001 National Survey of Student Engagement (NSSE), Pike and Kuh (2005) conducted a factor analysis to classify 317 four-year colleges and universities by type of student engagement using twelve student engagement scales from the survey. Chi square tests showed significant relationships between engagement type and Carnegie classification—the typology of higher education institutions—that departed from the traditional expectations. Based on these outcomes, Pike and Kuh (2005) argued for using the following engagement typology as a supplement to the Carnegie classification:

- Diverse, but interpersonally fragmented: Institutions do not support academic or social needs and peers are not supportive.
- Homogeneous and interpersonally cohesive: Institutions and peers are supportive.
- Intellectually stimulating: High engagement with faculty inside and outside the classroom and collaborative learning with peers.
- Interpersonally supportive: High diversity experiences, support from peers and institution, and interaction with faculty.
- High-tech, low-touch: Low collaboration, interpersonal interaction and academic challenge.

- Academically challenging and supportive: Faculty set high expectations and students and institution are supportive.
- Collaborative: Students are supportive and have regular contact with faculty.

This study has not been replicated at community colleges so there is not a comparable typology of student engagement for these institutions. Nonetheless, there is clear indication that there is significant correlation between some institutional attributes and the way in which students engage with their institution and with each other.

Social Normative Environmental Influences

Pike and Kuh's (2005) study of student engagement demonstrated that there are complex practices and much variation between the practices of different types of institutions. Braxton and Caboni (2005) described an informal mechanism by which this variability is maintained. They found that student norms in a four-year institution setting influence some educational efforts such as faculty-student contact, cooperation among students, and high expectations. These practices align with Chickering and Gamson's (1987, 1999) good practices. These findings emphasize the role of the student peer group as a socializing agent as theorized in college impact models of student learning (Pascarella, 1985; Tinto, 1993; Weidman, 1989). In this section, I define institutional culture and norms. I also introduce research that points to the need to acknowledge and study multiple and differing social environments at and

between higher education institutions. These variations influence how different students experience their colleges and are affected by them.

Distinguishing culture and norms. College impact models of student development emphasize the academic and social environments in which students interact with various elements of their institutions. Especially when considering the social environment, it is helpful to place these interactions in the overarching context of institutional culture. The definition of institutional culture combines the elements of the environment that guide student behaviors:

> Culture in higher education is defined as *the collective, mutually shaping patterns of norms, values, practices, beliefs, and assumptions that guide the behavior of individuals and groups in an institute of higher education and provide a frame of reference within which to interpret the meaning of events and actions on and off campus.* This definition emphasizes normative influences on behavior as well as the underlying system of assumptions and beliefs shared by culture bearers. (Kuh & Whitt, 1988, pp. 12-13)

Kuh and Whitt (1988) warned that while it is necessary to isolate elements of a culture to study it, it is important to acknowledge that culture is holistic and unique to each institution. Yet, they also recognize that colleges and universities are not monolithic and should be studied as multicultural entities. Kuh and Whitt elaborated that student subcultures emerge through significant experiences shared by groups of students dealing with persistent conditions or challenges internal or external to the college environment. These subcultures are

maintained and passed on within the college as values and attitudes that shape the behaviors of future generations of students. Braxton (1990) affirmed that norms, which are "transmitted through expressions of preferred and prohibited behavior and through example by members of the community" (p. 463), guide members of a community toward the behaviors expected of them.

Norms. Norms regulate behavior. Sociologists like Hechter and Opp (2001) ascribe social phenomena no less diverse than queuing, fertility, cooperation, crime, government effectiveness, and social order to social norms. Horne (2001) described norms as informal social controls that regulate behavior. These norms are not just rules; they are enforced with sanctions. Actions viewed as correct are rewarded while those actions that deviate from the norm in a particular setting are punished. Horne (2001) noted that social sanctions are the principal mechanism for enforcing norms, although she notes that there are a variety of motivators for these social sanctions. Those who apply sanctions may not just be interested in the content of the norm itself, but they are likely to earn beneficial relationships with others in the peer group interested in correcting the deviant behavior. Noteworthy also is that the existence of formal control mechanisms actually weaken informal social controls. Thus, in an education setting, the enforcement of positive social norms will depend on the existence of well-connected peer groups and the presence of well-communicated norms that are not structurally enforced by formal systems.

Ethington (2000) explained the normative environment in terms of Weidman's (1989) model of undergraduate socialization. A norm is a rule,

standard of behavior, or conception. Students feel "pressured to conform to the actions and conceptions of the groups of people to which the individual belongs and with whom the individual interacts" (Ethington, 2000, p. 705). In "involving" community colleges, Ethington emphasized that the student peer group develops norms of engagement through student interactions structured in intentionally designed and broadly practiced interactive classroom experiences as well as in actively facilitated social engagement opportunities. This approach to socialization emphasizes the effect of institutional characteristics and practices on developing the peer group. Human aggregate models place a greater emphasis on the background characteristics of members of the peer group(s) in creating the normative environment.

Pascarella and Terenzini (2005) described human aggregate models in a manner consistent with Pascarella's (1985) model for assessing change and Weidman's (1989) model of undergraduate socialization. Pascarella and Terenzini relegated human aggregate models to psychosocial or typological theories, which are developmental theories of student change. Nonetheless, their description of human aggregate models suggests a normative or socializing effect that confirms the potential of student peer groups or subpopulations to affect the college environment in maintaining stable institutional characteristics:

> Authors of human aggregate models describe an environment and its influence in terms of the aggregate characteristics (for example, sociodemographic traits, goals, values, attitudes) of its occupants. According to this view, individuals create or define environments even as

> these environments attract other individuals and help socialize them to maintain the interests, attitudes, values, and behaviors of all occupants. (Pasacerella & Terenzini, 2005, p. 47)

This approach allows conceptually for the development of multiple peer groups influenced by goals and values found among demographic subpopulations.

Definitions. Morris (1956) theorized that "norms are generally accepted, sanctioned prescriptions for or prohibitions against, others' behavior, belief or feeling, i.e. what others ought to do, believe, feel—or else" (p. 610). Caboni et al. (2005) defined norms as "patterns of belief about behavior expected in certain situations or circumstances that are shared by members of a particular social group" (p. 519). Caboni et al. articulated this concept as the regulation of social behavior through norms. Braxton and Caboni (2005) added, "Sociologists define norms as configurations of belief about behavior expected in various situations or circumstances" (p. 2). The emphasis on communal expectations of behavior in Caboni et al. and Braxton and Caboni's definitions focuses Morris' (1956) distinction between held values and communally enforced norms:

> Values are individual, or commonly shared conceptions of the desirable, i.e. what I and/or others feel we justifiably want—what it is felt proper to want. On the other hand, norms are generally accepted, sanctioned prescriptions for, or prohibitions against, others' behavior, belief, or feeling, i.e. what others ought to do, believe, feel—or else. Values can be held by a single individual; norms cannot. (p. 610)

Educational researchers have also connected the behavior of individuals to the influence of their peer groups in college impact models (Astin, 1993; Kuh & Whitt, 1998; Newcomb & Wilson, 1966; Pascarella & Terenzini, 2005). These definitions tie normative cultural traits of a student body to student engagement.

My study explored differences in engagement, regarded as a positive behavior linked to student persistence and success (McClenney & Marti, 2006), in the context of multiple college student subcultures. The particular focus of this study was to explore the effects of racial and ethnic student body composition at urban community colleges on engagement and persistence. To that end the following is an operational description of how normative behavior may be enforced within a group.

> Social interactions . . . include words, gestures, and behaviors of peer group members that communicate expectations for behavior by group members, indicating which behavior is highly appropriate or highly inappropriate. For example, members of a peer group may chide a member who studies excessively. Such a rebuke communicates a group norm against studying too hard. (Braxton & Caboni, pp. 2-3)

This research study used self-reported engagement behaviors and subsequent, observed persistence in college. The study was limited to examining associations between the behaviors of individuals and the composition of the student populations at multiple institutions. As such there is only a presumed or theoretical linkage to engagement behaviors being influenced by normative systems at each college. Literature on the effect of normative

structures at community colleges is very limited (Akin, 2010) and none was identified that focused on colleges with large minority student components such as those in this study.

Research on student norms in higher education. Norms play an important role in the socialization of students in the higher education environment, which is a common feature of college impact models. Braxton (1990) affirmed that norms, which are "transmitted through expressions of preferred and prohibited behavior and through example by members of the community" (p. 463), guide members of a community toward the behaviors expected of them. Consequently, this portion of the literature review ties the research on normative pressures to student engagement and social integration. In addition, it lays the theoretical groundwork for questions about the effects of the presence of student subpopulations, especially differing mixes of racial and ethnic student populations, on the normative environment to which students are exposed.

Braxton and Lien (2000) argued that Tinto's Theory of Departure (1975, 1993) should be updated to include normative integration into college communities. Tinto's theory posited that students depart college in part because their values do not match the prevailing values at the college. From a policy perspective, an adaptation of Tinto's departure model, which is derived from Durkheim's (1951) study of suicide, would acknowledge the role of normative integration whereby students adopt the norms of a community through a system of rewards and sanctions. Policies and practices under this updated regime

would support formal and informal systems of student adaptation to the college community that encourage students to fit into the social system described by Tinto.

Caboni et al. (2005) observed that little empirical research has been conducted to define normative structures among college students despite the recognized effects of peer groups on students in the research on college impact (Astin, 1993; Pascarella & Terenzini, 2005; Tinto, 1993). Consequently, Caboni et al. (2005) conducted a quantitative, survey-based exploratory study to identify the presence of a normative structure among undergraduates at a highly selective, residential research university and to identify the level to which these norms are espoused among different groups such as gender, racial and ethnic groups, class standing, or membership in sororities or fraternities. With a small sample size (N = 214), the researchers grouped non-White students, comprising a total of 18.2% of the sample population (and representative of the university's population) into a single non-White group.

A factor analysis of survey responses about student attitudes toward various hypothesized behaviors produced ten normative factors that the researchers grouped into three categories: Inviolable norms, admonitory norms, and laudatory norms. Univariate analyses were used to identify differences on each of the ten normative factors: T-tests were used for the dichotomous student characteristics (gender, and race/ethnicity–which was collapsed in this study into White/non-White); Analysis of Variance was used for class standing and fraternity or sorority membership.

There were differences between student groups based on race and ethnicity. Among their findings, the authors concluded that there were differences between White and non-White students on admonitory norms but no statistically significant differences on inviolable or laudatory norms. The authors interpreted this to mean that there are core institutional norms against gross misbehaviors and for encouraged behaviors–perhaps these are institutional values–that are shared uniformly by all students, while non-White students collectively found some inappropriate behaviors to be less acceptable than White students. Other student characteristics showed varied differences on some normative behaviors by gender and affiliation with sororities/fraternities, but not by class standing which was ultimately defined as a dichotomous variable: Freshman or more senior. The latter observation suggests that students do not change their perspectives over time at the institution beyond the first year. That is to say, students become socialized in their first year at college.

While this study showed statistically significant differences between various groups on normative behaviors, its applicability to urban community colleges is limited. The study focused on a highly selective university population that would draw from a large geographic area. Community colleges mostly serve local commuter populations and are non-selective. The student population in the study was over 80% White and the study grouped all minority students into a single non-White group thus masking potential differences among students of varied racial and ethnic backgrounds who are heavily represented in urban community colleges and are majority groups in the colleges in this study. Finally,

the study sample of 214 student participants responding from among the 1,000 invitees was small when considering the need to study the diversity of student backgrounds and experiences to be found in a dense urban environment. Nonetheless, Braxton and Caboni (2005) recognized that student bodies are not uniform. They may contain subgroups that do not provide consistent normative support or resistance to formal policies or practices, for example.

Akin (2010) conducted a study comparable to Caboni et al. (2005) and also found a normative structure to exist at a community college. These norms included such proscribed behaviors as personal attacks and predatory sexual advances, admonitory behaviors such as ethical academic violations and negligent endangerment of others, and laudatory norms such as protecting others' welfare and participating in auxiliary collegiate programs, which was a significant finding in this study. The finding that community college students approve of participation in extracurricular activity as a social norm contradicted findings by other researchers who have emphasized academic integration and minimized the importance of social integration in community college engagement research (Marti, 2009; McClenney, 2007). While both Marti and McClenney showed academic integration to predict high grade point average, the laudatory nature of findings on student engagement norms in a university setting by Caboni et al. (2005), and at a community college by Akin (2010), indicates a normative system that must be examined in light of the possible effect of college norms of student engagement on student persistence at college.

In addition, normative differences between racial and ethnic groups were found in the community college study by Akin (2010). In her quantitative study based on student self-reporting on a college student behavior inventory, Akin found differences to exist between students' level of espousal for the normative structure based on gender, race and ethnicity, class standing, age, and full-time status. Akin found no differences on these norms between first generation college student and students whose parents had attended at least some college.

There is little research on community college student norms. Specifically, Akin (2010) found that "no studies were identified that specifically address the effect of race/ethnicity on the cultural values of community college students" (p. 16). The limited studies described here of student norms in higher education have focused on single institutions with large White student majorities. While acknowledging that her sample did not represent the national population and was not generalizable, Akin (2010) still reported differences between her community college study and Caboni et al.'s (2005) four-year study as they pertained to White/non-White student results.

In addition to providing results that combined the perspectives of small samples of non-White students into one viewpoint, the studies conducted by Caboni et al. (2005) and Akin (2010) did not control for student background characteristics. Consequently these two studies, while raising interesting questions about differences in normative perspective between racial and ethnic groups, did not control for the differences between students within White and

non-White groups and can, therefore, contribute little to educational practice at colleges with large minority populations.

Other studies have recognized the important socializing effects of the external cultural milieus in which students are immersed and these external socializing effects are acknowledged in college impact models (Tinto, 1993; Weidman, 1989). Nora, Cabrera, Hagedorn, and Pascarella (1996) conducted a multi-institutional, multiethnic logistic regression study of the persistence of 3,900 students at 26 two-year and four-year, public and private residential and commuter institutions. While they examined the effects of the pull from external ethnic communities as socializing factors that complement student environmental factors such as academic and social engagement, they did not attend to the internal college student population mix as a key socializing environmental factor. Furthermore they grouped students into very broad classifications: minority and non-minority. These classifications apply only poorly to community college students as they presume that White students come from a uniform culture—a difficult argument to sustain in urban community colleges with large White immigrant populations—and that all other cultural groups behave similarly across cultures and geographic regions.

Racial and Ethnic Student Body Composition

Race and ethnicity imperfectly categorize individual students and student bodies. Racial and ethnic categories are socially constructed and shift over time (Omi & Winant, 1994; Spring, 2012). These groupings are defined so broadly as to capture groups of students who may not have the same motivators, social

supports, or historical backgrounds and, by extension, performance in collegiate settings (Kim, Rendon, & Valadez, 1998).

The study of the effects of college on students from different racial and ethnic groups exhibits some weaknesses. While some argue that social science has been reductionist in categorizing race and culture (Baez, 2004), and others argue for a continuum between groups rather than rigid nominal categorization (Fernandes Williams, 2013), there exist, nonetheless, real sociological differences between these imperfectly categorized racial and ethnic groupings. These social groups evince measurably, significantly different behavior and performance in college (Swigart & Ethington, 1998). However, Pascarella and Terenzini (2005) found in their synthesis of educational research in the 1990s that the evidence of how students from different racial and ethnic groups benefit differently in college is inexplicably contradictory. So while it is clear that students from different racial and ethnic groups must be studied to better understand how they may learn and develop differently, it is important to continually acknowledge both the imperfection and variability of what constitutes a minority or majority group in one collegial context or another. Normative pressures and associated effects on student engagement at each institution may vary with the variation in the regional social dynamics and in the degree to which racial or ethnic groupings are appropriated by the students.

Racial and ethnic identity. Spring (2012) noted important shifts in racial and ethnic self-identification after the passage of the Immigration and Nationality Act of 1965, which liberalized immigration from non-European countries. He

reported that the term African American does not apply to one in ten Black people in the US who are immigrants. Further, two-thirds of the foreign-born Blacks in the US are not from Africa. Spring (2012) added that racial identity among immigrants is more complex than the traditional racial and ethnic distinctions; "First- and second-generation immigrants when asked their race used a variety of descriptors, including nationality, ethnicity, culture, and language. In other words, racial identity varied among new immigrant groups" (p. 104). By contrast, Spring observed that over 90% of native-born Whites and African Americans adhere to the former legal Black and White classifications.

Traditional White racial identity was established as a combination of legal and historical distinctions based on European immigrant roots and in contrast with Black American experience. Citing Helms' White racial identity development model, Pascarella and Terenzini (2005) focused on abandoning historical superiority and entitlement, "For Whites, the issue in racial identity development is the recognition and abandonment of beliefs in White superiority and privilege and the rejection of normative White strategies for dealing with race" (p. 27). This model perpetuates a European American perspective of White Americans. However, like Blacks, Asians, and Latinos, especially in urban areas, Whites are an increasingly diverse population that has mixed traditions from more recent immigration from Eastern Europe, the Middle-East, North Africa, and parts of Central Asia. "The term 'White' refers to people having origins in any of the original peoples of Europe, the Middle East, or North Africa. It includes people

who reported 'White' or wrote in entries such as Irish, German, Italian, Lebanese, Persian, Near Easterner, Arab, or Polish" (U.S. Census Bureau, 2001, p. 1).

Writing on the study of diversity, Baez (2004) criticized social science research for being positivist and reductionist. He argued that researchers should identify the inherent cultural construction of difference that perpetuates it as if it were a biological fact. Even acknowledging the social construction of race and ethnicity, there remain real and important distinctions between students in higher education and in community colleges, which attract underserved and educationally disadvantaged students.

Racial and ethnic groups do not behave uniformly. For example, Kim, Rendon, and Valadez (1998) found that both school and family factors affected Asian students in significantly different ways when studying the academic aspirations of 973 Asian American tenth-grade students who had cultural roots in China, the Philippines, Japan, Korea, Southeast Asia, and South Asia. Factors such as school academic climate, track placement, academic performance, parents' expectations, self-concept, and peer influence affected students differently depending on their national origin.

Additionally, the categorization of race is in continual change (Omi & Winant, 1994; Sundstrom, 2001). Fernandes Williams (2013) argued for a continuum between real and nominal racial categorization where social forces such as labels, institutions, laws, values and traditions reify these categories. In addition to racial classifications being imposed either by superior power or by people acting according to how they have been categorized, "a third

categorization is imposed when normative standards become attached to the label and are applied to those within and without the label" (p. 179). This categorization points to two competing perspectives in a higher education setting: (a) Social norms can be significant in shaping student behaviors, and (b) those norms may vary between institutions based on institutional culture, policies, student body composition, and the historical challenges faced by student groups, the resolutions of which have shaped the norms at a college. This argument points to the importance of using a research methodology that allows for distinctions to emerge between the effects of exposure to the social normative effects of the same socially constructed broad racial and ethnic categories in different colleges.

Research on normative effects in diverse student bodies. Normative effects of student body composition have been studied prospectively for effects of integration. Arlin, Mickelson, and Nkomo (2012) noted a paucity of empirical evidence on school composition effects and normative indicators of social cohesion in social science literature. They studied positive normative effects of civic engagement but questioned whether integrated K-12 education actually led to behavioral changes in student civic engagement.

Research findings on contingent effects of student demographics on student development at community colleges is limited. With few notable exceptions, such as Caboni et al. (2005) and Akin (2010), findings tied to normative effects linked to differential outcomes among student racial and ethnic subpopulations tend to be more coincidental in other studies. For example, Bahr

(2008) conducted a large scale study that showed the presence of an effect of student population composition on educational outcomes. His study also showed a contingent positive effect of engagement with student services on underprepared students. The study tracked student transfers over a period of six years, providing further evidence for extending tracking beyond traditional timelines for community college student completion. But the focus of the study was not on student body demographics; rather, it was focused on the overt and covert functions of the community college.

In a large-scale, three level hierarchical discrete-time event history regression analysis, Bahr (2008) rejected the traditional view that community college students experience "cooling out" of their college aspirations by college counselors. Bahr studied the effects of advising on two cohorts of first-time freshmen over a six-year observation window. He tested the effects of counseling on successful remediation in mathematics in a cohort of remedial math students (N = 30,118), and on successful transfer in a cohort of transfer seeking students (N = 68,241) from 107 California Community Colleges.

Bahr tested whether there were differential effects by level of student college readiness or by student race and ethnicity. Bahr also analyzed the effects of counseling on these two cohorts based on the average college readiness at the institutions and on the racial and ethnic composition of the colleges. He found significant differences of the effects of counseling on transfer-oriented students: Black students benefited positively but less than White students and Hispanic students benefited less at institutions with higher

proportions of first-time Hispanic freshmen. For both cohorts, Bahr concluded that counseling has a positive effect on achieving student goals that was greater for academically underprepared students.

In a less direct finding on peer group racial and ethnic dynamics, Durham, Hays, and Martinez (1994) compared the encouragement that White and Latino college students in southern Colorado and northern New Mexico received. They found that both populations received encouragement from their parents, but only the White students received peer support.

Research comparing the effects of racial and ethnic composition tends toward between-institution studies. Compiling research on African American students before and since 1990, Pascarella and Terenzini (2005) concluded that historically Black colleges and universities (HBCUs) offered an advantage over predominantly White institutions (PWIs). They concluded that African American students "confront significantly more social isolation, alienation, dissatisfaction, and overt racism" at PWIs than at HBCUs (p. 393). Not surprisingly Pascarella and Terenzini attributed these differences to supportive social environments at HBCUs, including the effects of mission, student-orientation, peer climate, and general institutional culture, which led to higher completion rates and aspirations to careers and graduate school. Astin, Tsui, and Avalos (1996) even computed a 17% advantage in students' completing a bachelor's degree when comparing African American students at HBCUs to students at PWIs even after controlling for student backgrounds and institutional size and selectivity.

Community colleges tend to be non-selective and mission-neutral regarding their student populations despite their population composition. The sort of between-institutions research on PWIs and HBCUs cited above generally leaves out community colleges. Even though community colleges have their counterparts to HBCUs, they can have much more complex student populations. Because most community colleges are public institutions and draw primarily from a local radius (Cohen & Brawer, 2008), they offer less mission-specific focus on particular racial and ethnic populations. Community colleges may be labeled minority serving institutions (MSIs), but they tend to be more complex than what is reflected in dichotomous four-year institutional comparisons. MSIs may serve multiple populations. Indeed community colleges can be labeled as predominantly Black institutions (PBIs) if they serve more than 40% Black students, and qualify for federal grants to improve student success. Community colleges may also qualify for Hispanic serving institution status (HSI) if they serve more than 25% of Latino students and qualify for different federal grants. A community college may qualify for either status, depending on its population–which generally reflects its local region—and still be a PWI. A community college could also be identified as both and HSI and PBI and have programs that serve to improve the learning environments with the expectation of benefitting the target populations.

National research targeting specifically community colleges serving low income students and at-risk students of color is beginning to emerge in reviews of a large-scale student success initiative, Achieving the Dream (Zachry

Rutschow et al., 2011). Most colleges participating in this initiative are implementing dual strategies to increase academic and social support systems and promise future research on how these services affect students disaggregated by race and ethnicity.

Chapter Summary

In Chapter 2, I reviewed research on college impact models of student development that will serve as the framework for the research study. This literature supports the variables selected for this study that are described in the next chapter. These elements included community college student background and entering characteristics, the social and structural environment within which students experience college, and the ways in which student engagement with the college steers further experiences.

Useful empirical literature was found that guided the selection of practical outcomes measures that were used to drive the statistical analysis of students' college experience. Hybrid models of attendance and course-taking were adopted from this literature. These will be operationalized in the research methodology chapter.

While research on college impact on students is plentiful, research on the normative influences that shape local attitudes and behaviors at a college as a unique environment was limited. Where this research existed it focused on predominantly White institutions and tended to group non-White students into one group for which studies attempted inconclusively to attribute common characteristics.

While research on college experiences was not lacking, research on community colleges and the nature of their diverse populations as unique environments was found to be limited in contrast with four-year institutions. In addition, large system-scale studies were found to neglect local college social system variations as well as variations within overarching racial and ethnic groups.

From the range of available college impact models described in literature, I selected Wiedman's (1989) Model of Undergraduate Socialization as a college impact theoretical framework for this study because of its attention to both psychological and social structure influences on student development. The research on college culture and social normative pressures helped to define and distinguish these concepts. I have argued for Astin's (1991) Input-Environment-Output (I-E-O) model as a methodological frame to analyze the research data as will be detailed in Chapter 3.

CHAPTER 3

RESEARCH METHODOLOGY

In this research study, I assessed the effects of the racial and ethnic composition of the student bodies at nine urban and suburban community colleges serving a plurality of minority students on academic and social student engagement behaviors and on persistence in college. Because of the critical national student completion agenda and the strong demand for community college accountability in California, it is important to understand how to improve student retention and to support students in completing their goals.

The findings of this study expand the literature on how community college students engage with colleges serving large, complex proportions of minority students. By expanding the knowledge base on how student population composition affects student engagement and persistence, the findings of the study could influence policy development to improve student success. Research on minority-serving institutions with complex student bodies should also be expanded.

Performing quantitative analysis of survey data of student engagement at multiple, similarly-structured community colleges allowed me to identify differential effects of educational environments on student engagement and on the persistence of students in pursuing their studies. A large data set allowed differential effects of student engagement to be disaggregated by student

background, experience, and preparation. By accounting for differences among students' backgrounds and preparation, the study discerned the effects of students' engagement with distinct community college environments on student persistence. Differences in outcomes are ascribed to the different educational experiences in different college environments (between-college differences) or to different levels of engagement of students with those educational programs or services at the same institutions (within-college differences). Weidman's (1989) Model of Undergraduate Socialization provided the theoretical framework for this study and Astin's (1991) Input-Environment-Output (I-E-O) assessment model guided the research methodology. Pascarella's (1985) General Model for Assessing Change provided a secondary college impact theoretical framework and supported the selection of variables to be used in the analysis of student engagement and persistence.

The following research questions guided this study:

1. What is the effect of racial and ethnic community college student body composition on student persistence?
2. Does the racial and ethnic composition of a community college's student body have differential effects on the persistence of students from different racial and ethnic groups?
3. What is the effect of racial and ethnic student body composition on student academic and social engagement?

Methodology

Creswell (2009) defined three components in research design: philosophical worldviews, strategies of inquiry, and research methods.

Theoretical and Philosophical Worldviews

This study focused on students who attended racially and ethnically diverse community college environments. It examined the influence of engagement with peers and with the institutions on student persistence as an important factor in student goal completion. The focus on multi-institutional research is justified in quantitative studies that use large data sets to identify student background and institutional environmental factors that influence many college outcomes (Astin, 1991; Pascarella & Terenzini, 2005).

Research in four decades of studies on comparable college impacts has relied on predictive statistical methodology that reflects a positivist worldview (Pascarella & Terenzini, 2005). This study explored the existence of different approaches that students may take in building their relationships with their colleges that may be affected by the presence of varied cultural influences at the colleges. The prospect that students construct different meanings about their experiences and their interactions with the colleges based on the sociological influences of racial and ethnic student populations at different colleges undermines the use of a positivist approach. In the following sections, I provide justification for the applicability of quantitative methodology limited to an exploration of the presence of effects on students exposed to different environmental factors. I also propose applying a post-positivist epistemological

perspective that acknowledges limitations of positivist, causal analytical methodology. Acknowledging the limitations of a methodology that is positivist in nature allows later interpretations of the findings to recognize the co-construction of the environment and college experience in which students and colleges engage using a constructivist lens.

Theoretical perspectives. There is a long tradition of research on the impact of college on student development. From a student development perspective, Pascarella and Terenzini (2005) contrasted college impact models of student change with developmental theories: "These impact models concentrate not so much on any particular intraindividual process or dimension of student change as on the origins and processes of change" (p. 52). Rather than focus on student psychological processes, the focus of college impact studies is on environmental and interindividual influencers of student development.

> Whereas student-centered developmental models concentrate on the nature or content of student change (for example, identity formation, moral or cognitive development), college impact models focus on the sources of change (such as different institutional characteristics, programs and services, student experiences, and interactions with students and faculty members). (p. 19)

Consequently, college impact models focus on populations or cohorts of students rather than on individual students. The sociological focus of college impact models has therefore lent these models to quantitative, survey-based studies of

large sets of students and encouraged the comparison of effects between institutions (Astin, 1991; Pascarella & Terenzini, 2005).

The approach taken in this study emphasizes my practice as an educational administrator. College impact models reflect the influence of the teaching and learning environment, which I, as a practitioner, believe can be improved with better models of how community college students learn. Because of their distinct personal histories, students come to college prepared with different knowledge and social skills that influence their behaviors and interactions at college. Given their diverse backgrounds, experiences, and preparation, students will benefit more from their interactions with the various elements of the college environment and will persist better in their studies if policies are sensitive to their particular predisposition to engage with the various elements of the college (Tinto, 1993). Methodologically, these student background or "Input" characteristics must be controlled for in order to better discern the effects of the college experience on the students.

Philosophical perspectives. In reviewing the literature of the 1990s on how students learn, Pascarella and Terenzini reported a shift away from what had arguably been up to that time a positivist-realist or behaviorist pedagogical epistemology that dominated educational research in the latter half of the twentieth century. "Scholars no longer regard learning solely as an act of acquiring or absorbing a set of objectively verifiable facts and concepts and, subsequently, incorporating them into long-term memory" (Pascarella & Terenzini, 2005, p. 3). The epistemological shift cited in the literature on student

learning supports the emergence of constructivist pedagogy wherein knowledge is constructed by the learner through collaborative interactions with faculty and student peers. Students are increasingly seen as creating their own knowledge rather than receiving "truth."

Constructivism, as a challenge to positivist, behaviorist pedagogy posits that students are active participants who assimilate prior knowledge with new information and experience. As a guide to pedagogical methods and to research perspectives, the constructivist goal is to foster active learning. Social interaction and structuring of learning environments and experiences that allow learners to create their own truth and reality are central tenets of this constructivist pedagogy (Fosnot, 1996; Ozmon, 2012).

Research on student development must recognize the purposeful, structured influences of educational environments. Emerging research acknowledges constructivist pedagogy, with its strong elements of social interaction between learner, teacher, and environment. After several decades of research on the impact of the learning environment on students, there is a strong research base for the study of the interaction of students with their learning environment (Astin, 1993; Bowen, 1977; Feldman & Newcomb, 1969; Kuh, 2009; Pascarella & Terenzini, 2005; Tinto, 2012). Tinto (1993), in his Theory of Departure, provided a model for both positive and disconfirming interactions within and outside the learning institution. Much of the research in this tradition has been quantitative because of the large, multi-institutional data sets needed to

generalize impacts on students as effects of the institution or institutions as a whole.

Postpositivist worldview. If college pedagogy has leaned toward constructivism, quantitative research methods on student learning that acknowledge that pedagogy and its social interaction elements have tended toward postpositivism. The postpositivist worldview evinces a deterministic approach of cause and effect or outcome, and a reductionism of ideas into discrete, testable elements. Further, the postpositivist epistemological lens accepts an objective reality that can be observed and measured and posits that this reality conforms to laws that can be described with theories (Creswell, 2009). However, postpositivism differs in crucial ways from positivist, deterministic thinking.

Postopositivist methods, using the scientific method of theory development and evaluation, are consistent with the statistical analysis research methodology that has dominated college impact research that emerged from social science methodology (Astin, 1991). Postpositivist assumptions in research, unlike positivist thinking, accept that research is imperfect, knowledge is conjectural, and absolute truth cannot be found. While in this methodology research methods shape knowledge through data and analysis, it is assumed that knowledge can be continually refined and prior assumptions can be discarded in the face of new, more credible evidence. Practice in postpositivist research also requires that assumptions, methods, and conclusions be tested for bias. In quantitative methods seeking to establish causality, theory and data

guide acceptance or refutation of conclusions, accepting that preconceived models must be discarded if not sustained (Creswell, 2009).

Role of the researcher. I self-report in census and surveys as White, Protestant, male, over age 50. However, I am also the son of Palestinian war refugees. I entered the United States as an adult international student, and I am a first-generation college graduate. I was brought up in a middle stratum under strict segregation and social structuration based on country of origin as an expatriate under British colonial rule living in an oil camp in a small Arabian Gulf country. While I understand social stratification by racial and ethnic identity, nationality, socio-economic, and religious grouping based on my childhood experience, I approach their historical development, reality, and practice in the United States as a learning experience.

I am also a 25-year veteran practitioner in the California community colleges and the president of one of the colleges in the study. I bring both an institutionalized view and a contrasting eagerness for innovation and improvement in college success and student achievement. My constructivist educational philosophy is fueled by an abiding belief in the social justice role of the community colleges in California.

Strategies of Inquiry

It is perhaps ironic that as pedagogical methods have moved away from positivist philosophies, the advent of inexpensive, powerful computing in the latter twentieth century has created the opportunity for large scale empirical quantitative research. The tradition of college impact research cited above has

relied almost exclusively on large scale correlational or predictive designs using multiple regression techniques to measure the interactions of students' entering characteristics and college experiences on students' retention and success (Pedhazur, 1982).

Astin (1991) focused the concept of college impact research: "The generic concept of 'college impact' has meaning only in relation to what would happen if students either did not attend college or attended a different type of college" (p. 5). Astin was critical of conceptual models that only measured change in students. He argued that both cognitive and affective change can be measured in college students over time but can also be observed as a result of student maturation and/or the life experiences of individuals not attending college. He insisted that the effects of the college environment be accounted for in research on student development in college.

To measure the effects of college environment on student development, Astin (1991) argued for two minimal requirements of college impact studies: multi-institutional data and longitudinal data. He defined multi-institutional data as "information collected simultaneously from students at contrasting types of institutions" and longitudinal data as "information on the ways in which students change between admission and some subsequent point in time" (p. 3). Astin grouped "a bewildering array" of environmental variables "under six headings: Characteristics of institutions; curriculum; faculty; the peer group; residence, major, and financial aid; and student involvement" (p. 33). Based on these groups of variables, differences between the impacts of different institutions on

students can be induced quantitatively on students with similar incoming characteristics.

This study used data collected uniformly at multiple institutions, using the same sampling methods. These institutions are all community colleges in the same college district and, therefore, share many structural characteristics. This relative uniformity of institutions aided in de-emphasizing differences due to contrasting effects of college structural characteristics. This structural consistency may amplify the differences in local environmental variations such as special programs or institutional cultural characteristics. While the first of Astin's two requirements is satisfied, a limitation of the methodology of this study is that the progress of students was not studied longitudinally. Data on individual student engagement and persistence were not collected over time. Rather, the student survey captured the engagement of a random sample of students and controlled for their background characteristics. Student records, tied to individual survey takers, provided a longitudinal element to the study by allowing course-taking patterns to be discerned over time prior to and after the survey.

It is important to note that structured survey instruments do not describe the rich cultural attributes of diverse student populations (Attinasi & Nora, 1992). The generalizability of the study is further constrained by the use of data from an existing general survey that was not designed for this particular study. The size and randomization of the original survey offer some compensation for the generality of the questions asked. Further, the passage of over six years since the students were surveyed in 2007, coupled with access to their complete

academic records, enriches the study with post-survey information that could not have been collected within the limited time for this study had I designed and administered the survey.

Another limitation to this study, built into the use of the existing student survey, is the lack of faculty or college staff input on the interactions of students with their colleges. Surveying student-reported engagement with the college is a common practice of other large scale studies such as the National Survey of Student Engagement (NSSE) and the Community College Survey of Student Engagement (CCSSEE) (Kuh, 2009; McClenney, 2007).

An important advantage of using a survey conducted internally by a large community college district is that the study does not rely on student reporting of academic progress. Actual student records were linked to survey responses so that survey data could be associated with accurate academic status such as full-time status, persistence, progress, and performance measures. Also, information about student migration between colleges was tracked at least within the district, which allowed distinctions to be made between students exposed to one college environment or multiple environments. Additionally, the large size of the data set minimized the effects of measurement error.

Pascarella and Terenzini (2005) identified two sources of college impact on student development: between-college effects, which they associated with the characteristics of institutions, and within-college effects associated with students' experiences. Like Astin's college impacts, the statistical methodology accounts for differences between students' entering characteristics. This

approach allowed the researcher to isolate the differences in within-college impacts on educational outcomes of students with particular characteristics of interest. It was also possible to study the effects on student outcomes of different college characteristics or experiences after accounting for differences between students.

Conceptual Model

Astin (1991) introduced a conceptual model for assessment of the impact of college on students. He described his Input-Environment-Outcome (I-E-O) model as a method to be used as what he termed a natural experiment. "In such experiments we try to study naturally occurring variations in environmental conditions and to approximate the methodological benefits of true experiments by means of complex multivariate statistical analysis" (p. 28). The advantages Astin claimed for natural over true experiments are that natural experiments avoid the artificial conditions of true experiments, and they allow the simultaneous study of the effects of many environmental variables. True experiments have unknown effects on both students and faculty who know they are part of experiments. Also, the special environmental conditions of true experiments cannot be truly reproduced if the experimental treatment is institutionalized.

Creswell (2008) referred to this research approach as correlational design. "Correlational designs are procedures in quantitative research in which investigators measure the degree of association (or relation) between two or more variables using the statistical procedures of correlational analysis" (p. 60). Key to correlational research, in contrast to experimental research, is that there is

no experimental intervention. Correlational research can also be inferential; it goes beyond describing a population or identifying trends to define associations or predictive relationships among variables.

As a comprehensive model, the I-E-O design allows the true effects of college environments and educational experiences to be studied. This model controls for the characteristics and experiences with which students arrive at college (Input) so that the differential effects of various environmental factors (Environment) on specified student outcome measures (Outcome) can be identified. While student outcomes are the dependent variables in these statistical analyses, it is typically the different intra- or inter-institutional environment of experiences that are the subjects of the study in college impact research. Methodologically, the conceptual model allows the effect of a wide variety of student characteristics and environmental variables to be treated as independent variables to study their collective effect (or how they predict) outcomes or dependent variables.

Weidman's (1989) Model of Undergraduate Socialization follows the I-E-O framework. It considers student background characteristics and pre-college normative pressures as the input variables. Weidman's model then considers as environmental variables numerous normative contexts including collegiate academic and social environments as well as external familial and non-college reference groups that combine to create the normative pressures that students experience during the time they are attending college. The socialization outcomes in Weidman's conceptual model include career choices, life style

preferences, aspirations, and values. In this study, I initially modified the environmental factors to include engagement behaviors among community college students as an intermediate outcome resulting from socializing normative pressures. As will be discussed in Chapter 4, I eventually elected to include all independent variables in a single regression block as multi-level hierarchical models yielded only very small additional information. I also modified the socialization outcome for the study population to be student persistence as influenced by the input characteristics and socializing environmental factors.

Astin and Weidman's conceptual models require large student samples at multiple institutions to be surveyed and assessed systematically over a period of time. To adjust for the complex, interacting influences of the many groups of variables that entered the analysis in this study, sophisticated statistical software was required.

Sociological, or college impact, models suffer a weakness in their potential to neglect complex, psychological student characteristics and developmental stages. Indeed, the rigors of college provide the types of rites of passage that precipitate the identity crises in students necessary to transition between psychosocial developmental stages (Chickering & Reisser, 1993; Erikson, 1980). Just as developmental models may neglect the sociological and environmental influences on student development, Pascarella and Terenzini (2005) asserted that overly simple student characteristics used in college impact models such as gender, race, and academic performance prior to college may neglect important student input characteristics such as prior experiences with institutions (for which

race is a poor correlate) and the level of maturity and readiness for the college environment (for which prior academic achievement is a poor stand-in variable).

Research Methods

Setting

The Los Angeles Community College District (LACCD) was selected for this study. The research sites were the nine colleges in a large, urban and suburban community college district located in a sprawling metropolitan area in southern California. The nine colleges in this district, with a service area of over 880 square miles, serve over 250,000 students annually with a fall semester enrollment of 142,000 in 2010 and a full-time equivalent student (FTES) count of 113,000 students in the 2010-2011 academic year. This district's enrollment comprises a considerable proportion of the national community college student population when compared to 1.5 million community college students enrolled in a typical semester in California (9%), and 7.2 million students in U.S. community colleges (2%) (LACCD, 2012). Table 1 lists the full names of the colleges and acronyms used in referring to them informally.

Table 1

Colleges of the Los Angeles Community College District

Community College Formal Name	Acronyms
Los Angeles City College	City, LACC
East Los Angeles College	East, ELAC
Los Angeles Harbor College	Harbor, LAHC
Los Angeles Mission College	Mission, LAMC
Los Angeles Pierce College	Pierce, LAPC
Los Angeles Southwest College	Southwest, LASC
Los Angeles Trade Technical College	Trade, Trade Tech, LATTC
Los Angeles Valley College	Valley, LAVC
West Los Angeles College	West, WLAC

College similarities. The colleges in this district share a common organizational structure. This uniformity may aid the study of the differential effects on student achievement of student background and demographic mixes at each college. Studying nine colleges in the same district has the advantage of holding constant the governing board structure, local regulations, unique faculty and staff union characteristics, outreach practices to the broader community, and underlying budgetary structures. The colleges in this study thus share uniform structure and policy profiles and share internal and external characteristics that will create more uniformity in institutional culture.

Scott (2014) showed that organizations respond together and strategically to environmental conditions that pressure the organizations to institutionalize responses. Because of the large size of this district, these nine colleges have developed a hybrid decentralized, highly coordinated structure which uniformly

influences the colleges' cultural characteristics. In addition to common policy, the colleges share very similar administrative and governance structures. Furthermore, these structures have district-wide "parent" organizations that serve to communicate and to keep uniform the practices at each college. By reducing the effects of organizational cultural and structural variability, differences in achievement may be more readily ascribed to unique internal environmental factors created by the mix of students' backgrounds and behaviors.

College differences. While structural uniformity between the colleges is advantageous to the study, the study design acknowledges considerable variability between the colleges. There is considerable autonomy in local faculty and administrative governance, which gives rise to unique initiatives, practices, and innovations. Over time, the colleges can be expected to have developed distinct cultures despite their structural uniformity. The tendency toward similarity distinguishes these colleges from surrounding college districts serving similar student populations; however the differences must be acknowledged and controlled for in the statistical analysis.

Sample

The population in this region is one of the most diverse in the United States, with a large proportion of immigrants from around the world and from nearby Mexico and other Latin American countries accessible by land. Residents of this metropolitan area have a higher than the national average proportion of residents living below poverty levels, having educational levels

below the ninth grade, and speaking English as a non-native language (Maxwell et al., 2003).

Because of the large area served by this college district, the students in its colleges represent a wide range of socio-economic backgrounds. Students can be expected to come to college with a broad range of academic preparation, aspirations, and opportunities. At one end of a wide spectrum, students come from wealthy, educated families to attend full-time but stay close to home until they are ready to move away to prestigious public or private four-year colleges and universities. At the other end are underprepared, underprivileged students who come from homes or even communities with little experience with higher education. In this mix of students also are undocumented students for whom the community college is the highest accessible, publicly funded educational opportunity.

College size creates variations in both curricular diversity and institutional economics. These variations may confound the effects of the internal environment created by the mix of student characteristics. These community colleges are open access institutions; the students themselves choose which institutions to attend. Enrollments at the colleges in this study range from 6,000 to well above 30,000 students, depending on which participants are counted as students among those that participate in cooperative training programs with public agencies. Because of the proximity of large and small colleges within and outside the college district it is important to acknowledge that students may select the institutions they attend for geographic considerations and for access to

course diversity. This selectivity by students was not accounted for in this study. Larger colleges offer more academic choices and opportunities, while smaller colleges may attract students interested in a more intimate, potentially personal setting. Additionally, because of economies of scale, larger colleges have traditionally experienced stronger financial positions. Nonetheless, the diversity of student populations consistently reflects the surrounding communities that each college serves.

The large number of students in these nine colleges was assumed to represent the global population of southwestern American community college students in mixed urban and suburban settings. The colleges have a broad range of size and diversity in student composition as represented in Table 2 (LACCD, 2012).

Table 2

Diversity in Size and Composition of LACCD Colleges

College Attribute	Highest College	Lowest College
FTES - Annual	25,200 (East)	5,400 (Southwest)
Age under 25	68% (Pierce)	46% (LATTC)
Percent Female	71% (Southwest)	48% (LATTC)[a]

[a]All other LACCD colleges have a majority of female students.

Racial and ethnic demographics. Student enrollment at the colleges reflected the local diversity of this large urban area. An internal geographic information systems (GIS) mapping study (LACCD, 2012) showed that student enrollment clustered geographically around each college. This effect was valid

even at one of the colleges that offered a quarter of its instruction online at the time of the study. The racial and ethnic student population mix is described in Table 3. This table shows that Asian, Black, Hispanic, and White students collectively comprise no less than 97% of the total student population at any LACCD college.

Table 3

Percent of Students at LACCD Colleges in Predominant Racial and Ethnic Groups in 2010

Race/ Ethnicity	College								
	City	East	Harbor	Mission	Pierce	South-west	Trade Tech	Valley	West
Asian	19.0**	18.5	17.5	8.2	17.3	2.7*	7.5	11.8	9.5
Black	12.4	2.1*	15.8	5.0	7.4	68.1**	29.7	7.0	41.8
Hispanic	45.2	76.5**	47.6	73.7	36.5	26.8*	54.6	44.2	30.2
White	22.0	2.2	17.5	11.6	35.7**	1.5*	7.0	34.2	16.5
Total	98.6	99.3	98.4	98.5	96.9	99.1	98.8	97.2	98.0

Note. Totals shown account only for the four predominant student racial and ethnic groups. This 2010 data introduces the diversity of LACCD students but differs slightly from the spring 2007 demographics on which the study is based. LACCD student demographics continue to reflect changing local communities.
* indicates lowest percentage in the district; ** indicates highest percentage in the district.

In reviewing the college compositions, it is noteworthy that East Los Angeles College had the highest Hispanic and lowest Black student populations and that Los Angeles Southwest College was comprised of the lowest Hispanic and highest Black student percentages. They both had very low White student populations at the time of the study. The opposite student body compositions of these two colleges (Hispanic and Black) offered an opportunity to compare most directly the effect of racial and ethnic student body composition on student

engagement as an intermediate outcome or on persistence as the outcome (dependent) variable in this study. However, these two colleges were different in other ways, which may have mediated the effects of the racial composition mix.

Student body racial and ethnic composition as environmental factor was central to this study. The populations in the study were distinctive in that no college had more than 35.7% White students. It is important to acknowledge that using four overarching racial groupings of students did not reflect a belief on my part that students within the group are uniform. Each group contains distinct subpopulations that do not share common histories. For example, White students in some communities included many immigrants from Eastern Europe, the Middle-East, central Asia, and North Africa, who shared little history, language, or background experience with White students native to the United States. Black students comprised both African Americans and, in some communities, immigrants from sub-Saharan Africa and the Caribbean. The Asian student designation is aggregated from nine different groupings in the district data set: Chinese, Japanese, Korean, Laotian, Cambodian, Vietnamese, Indian Sub-Continent, Filipino, and Other Asian. These nine groupings further mask distinct differences within these populations while other Asian population identifications were omitted. Hispanic students were aggregated from four different groups that do not distinguish the historical origins of Southwestern Americans from those of recent immigrants from other countries or continents. These groups were: Mexican, Central American, South American, and Other Hispanic. These groupings compounded the local cultural experience of Latinos

and Latinas with the immigrant experience. Some survey questions about student immigrant status and language spoken at home helped to disaggregate characteristics of natives from immigrants.

Furthermore, I recognized that individual students' background, experiences, and levels of academic preparation and achievement varied from the overarching racial and ethnic grouping (Museus, 2011). By using the overarching racial and ethnic groupings, however, this study acknowledged that the students' interactions with the broader racial and ethnic groups on campus and with the overall college community were also colored by how these students were perceived by these larger communities.

Population and sample racial and ethnic distributions. Table 4 compares the proportions of the four main racial and ethnic groups in the 2007 survey sample at each college and district-wide with the LACCD population statistics. The sample appears to be stratified by racial and ethnic groups. The percentage of students in the four predominant racial and ethnic groups in the sample is close to their percentage in the whole population at each college. It is noteworthy that the percentage of Black students in the sample was consistently smaller than that percentage in the population.

Table 4

Comparison of 2007 Sample Student Racial and Ethnic Demographics to College Populations

	Asian		Black		Hispanic		White	
College	*N*	%	*N*	%	*N*	%	*N*	%
City	22.0	21.8	9.3	11.2	36.9	41.0	24.6	23.2
East	20.0	20.1	0.9	1.9	74.7	75.1	2.0	2.1
Harbor	24.0	20.1	10.4	16.2	40.2	43.6	19.2	18.0
Mission	5.7	6.6	3.3	5.4	76.8	74.9	9.2	10.9
Pierce	20.2	18.5	4.9	6.6	29.9	32.1	34.6	37.3
Southwest	3.3	2.0	65.7	70.7	24.9	25.1	1.6	1.0
Trade Tech	9.3	8.3	24.1	31.3	56.5	53.2	5.9	5.8
Valley	13.1	11.5	4.6	6.6	40.2	42.9	33.1	33.4
West	12.6	9.7	34.6	45.6	31.1	26.9	13.2	14.6
District	16.1	14.9	12.4	15.9	46.7	48.3	18.2	18.0

Note. 2007 Student population composition by college (LACCD, 2013).

Sample focus. This study examined factors that lead to persistence. Records collected about student enrollments focused on students who, in a period not exceeding six years, had demonstrated intent to pursue a degree or certificate by completing six units of degree applicable coursework or basic skills classes that would prepare them for collegiate studies. Less than 1.5% of students in the resulting sample actually attempted less than six units. Students in the sample who enrolled in classes over a period of more than six years before or since the survey may demonstrate patterns of study that do not fit this research, such as repetitive retraining or lack of serious intent to complete a course of study. This means students who enrolled for the first time in a LACCD

college as early as fall 2001 (if they took the survey at the end of six years since their first enrollment) or as late as fall 2012 (if they took the survey at the start of a maximum of six years of enrollment) were included in the study. Thus, enrollment data from twenty-three semesters were examined to describe persistence and course taking for each student included in the study. The resulting sample that was ultimately analyzed was comprised of 91% of the students who attended12 terms or less and 98% of students in the sample who attended for 15 terms or less. The mean attendance of students in the sample was 7.14 terms with a standard deviation of 3.9, and the mean span of attendance was 8.66 terms with a standard deviation of 4.8. The figures describing number and span of terms attended reflect expected community college attendance patterns that tended toward part-time attendance and included some stopping out.

The LACCD Spring 2007 Student Survey instrument asks about student educational goals. Students were included in the study sample who identified educational goals including certificates, associate degrees, or transfer to a university to pursue any degree program. Sixteen percent of students in the sample that was analyzed reported that they were undecided and 6% reported that they were enrolled to discover or develop career interests. Both groups were retained in the sample as "undecided" majors. Only 3.4% of the resulting sample reported they were taking classes to advance their current job or career.

Students were included in the sample if they were in degree-seeking status. This means students were excluded if they were concurrently enrolled

high school students. If they had graduated and advanced to degree-seeking status, they were included even when their originally recorded goal had not been updated from "complete high school or GED." During the analysis, students who already possessed a degree or certificate, or who had already transferred to a university, were shown to behave differently from those without certificates or prior transfers and were eventually excluded from the sample and the analyses of engagement and persistence.

Data Collection and Management

The LACCD Spring 2007 Student Survey was conducted at all nine colleges. Twenty thousand five hundred student surveys comprised this sample, divided approximately equally at the nine colleges. The survey instrument is attached as Appendix A.

Of the target population of all students in this nine-college district, a representative sample has been surveyed every two or three years for the past three and a half decades. The LACCD Student Survey uses a probabilistic sampling method. All students participating in randomly selected class sections are asked to participate. This survey methodology eliminates self-selection among students who may be less likely to participate if asked randomly and individually. Self-selection may bias the sample. The randomly sampled survey data was stratified by location, time slots and disciplines. Creswell (2008) noted that this method is used to ensure that subgroups are not underrepresented in the survey.

Course sections used in the LACCD survey were selected by institutional researchers using random number generators applied to the total set of classes offered in the survey term. The smaller colleges were oversampled. This technique has the effect of ensuring sufficient participation from the smaller colleges while limiting the cost at larger colleges. The large educational center at the largest college was also oversampled to ensure a sufficiently representative population.

A major advantage of using an in-house survey is that individual survey responses could be linked by student identification number to students' actual academic records. A key characteristic of the data for this sample is that students' race and ethnicity as well as persistence and progress measures were extracted from the student records system. Demographic data were not collected in the survey nor were psychometric reports of student achievement.

This study used student data collected by the Los Angeles Community College District (LACCD). Surveys have been administered at the nine LACCD Colleges since 1976. For this study, data from the *LACCD Spring 2007 Student Survey* were used to identify the effects of college student body racial and ethnic composition on student engagement and persistence. The survey is given to approximately 20,000 students each year it is administered, divided approximately equally between the nine colleges. Students were surveyed randomly: Course sections are randomly selected and all students are surveyed in each selected section. As students may by coincidence be asked to complete the survey in multiple class sections at a college, or at more than one college if

they were attending multiple colleges, only one set of survey data were included by the institutional researchers for each student identification number.

This study used existing data collected by the LACCD from two sources: The *Spring 2007 Student Survey* and student registration and academic records maintained in the district student information system database. The two databases were cross-referenced using student identification numbers reported in the student survey. Because the surveys were administered to entire classes, students received careful instructions. Errors in reporting student identification numbers were corrected by institutional researchers using class rosters and by cross referencing survey data with the records of students in each class when the survey was administered. Both of these elements led to a high rate of survey completion and accuracy in cross-referencing to student records.

Because this study used a database of student surveys that were administered in spring 2007, no new human subjects were used. Any identifying data were expunged by institutional researchers prior to delivering data to me to maintain student privacy. Because the survey collected student identification numbers, the academic record of individual students could be cross-referenced with their survey responses. The courses taken by students before and after they took the survey complemented survey data by detailing students' ongoing course taking. The cross-referencing of these two data sets was conducted by institutional research staff prior to releasing any data to me and each student was given a new random identification number that is unrelated to the official student

records. The data that I received were anonymous, absent any identifying information.

Data were kept secure. A single database received from institutional research staff was entered into SPSS, a statistical analysis software package commonly used in educational research. The data were stored on a laptop computer that I kept at my home and on backup storage devices. I also copied the data to my work computer for purposes of secure backup and for consultation with LACCD institutional research staff.

In designing the study, I intended to identify outcomes at individual institutions. To resolve collinearity analytical problems with other variables in the multiple regression analyses, I removed the college identifiers and did not produce results that are identifiable by college. Nonetheless, I discussed these results with the research staff at the district office and with the college presidents or their designees. This gave the district office and each college the opportunity to correct data and understand the conclusions of the study prior to publication. It also allowed the colleges and the district to benefit from the conclusions of the study and any policy recommendations that emerge from it.

I have not identified any published or internal report on the reliability and validity of this survey; therefore, I computed reliability measures for scales that I created in this study.

Study Design Using an Existing Survey

The survey, by its nature, is cross-sectional. It measures student-reported characteristics and behaviors at a point in time. Because student identification

numbers reported in the survey allowed student records to be cross-referenced, survey data and each participant's course-taking data were combined to define a hybrid data set.

Although data are available from multiple LACCD surveys that contain similar student background and engagement questions from the spring 2007, fall 2009, and spring 2012 terms, the random sampling method did not capture data about the same students in each consecutive survey. Creswell (2008) described such a study that follows individual students over time as a panel study and that was not possible with the data from the existing surveys.

Data reduction. The *Spring 2007 Student Survey* instrument contained a series of 51 multi-part questions divided into the following groupings: identifying information, student background, financial resources, college services, college experiences, and campus facilities and services. Two open-ended write-in questions solicited information about college strengths and suggested improvements. Data from the open-ended questions were not used in this study.

Identifying information from the survey responses were used by the LACCD research staff to cross-reference to student data in the district's student information system database so that more student characteristics and course-taking information could be added to the study database.

Variables. Data from the *Spring 2007 Student Survey* and from the corresponding student records were divided into two groups: Input variables and environmental variables. The independent variables used in the multiple regression analysis on which this study relies are summarized in Appendix B.

Input variables. LACCD institutional researchers extracted student characteristics data from the LACCD student information systems database and matched them to student survey responses. The variables detail individual student entering characteristics and family histories such as gender, age, race or ethnicity, educational status, educational goal, financial aid status, financial resources, entering preparation, primary language, citizenship and longevity in the United States, parents' education levels, familial status and obligations, and disability status. The source in the survey or LACCD student information system and the coding method of student input characteristics are detailed in Appendix B.

Environmental variables. Environmental variables were divided in this study into two groups. The first group, titled environmental variables, described the college settings and experiences to which students were exposed merely by attending the college. The second group of environmental variables, titled intermediate outcomes, reflected students' choices and reactions to the college environment to which they had already been exposed. In intermediate outcomes, students' choices of how to engage with the college were evident. These variables were refined in Chapter 4 where their significance in predicting the persistence independent variable is reported.

Operationalizing the racial and ethnic environmental variables. As this study focused on the effects on student environment created by the student racial and ethnic demographics, only the relative sizes of the four predominant racial and ethnic groups were considered as environmental variables. The social

environment and normative effects of the environment were assumed to be influenced in good part by the perceived differences between large racial and ethnic groups as opposed to the 21 sub-groups by which students were allowed to self-identify on their college applications or by the smaller subdivisions of which individuals consider themselves to be members.

Racial and ethnic variables were defined as independent environmental variables to describe the scale of the presence of each of the four groups at each of the nine colleges in the study. Each of these four variables was populated with the percentage of students from that overarching racial or ethnic group who attended the college as their primary institution.

Operationalizing the interaction variables. I defined interaction variables to investigate the presence of contingent effects between students' racial and ethnic identity and the effect of a college's predominant racial and ethnic student population. To limit the number of interaction variables in this exploratory study, I limited the environmental factor to the college population that was predominantly of one race or ethnicity, defined here to be above 50% of the students at a college. As seen previously in Table 4, four colleges had a population (and survey sample) that was greater than 50% Black or Hispanic when the survey was conducted in 2007. No college had a population that was greater than 50% Asian or White. Colleges with no predominant racial or ethnic student population were defined as mixed for the purpose of this portion of the analysis.

The interaction effect of three college racial and ethnic predominant factors—Black, Hispanic, or Mixed—with the four predominant student racial and

ethnic identity characteristics created 12 interaction variables. These variables were given descriptive names: "Black at Hispanic College" or "Asian at Mixed College."

The very small proportions of students from racial and ethnic groups other than the four main groups were kept in the sample and included in the analysis of the interaction of all students with environments that express the distinct student cultural composition of each college. The total of all these groups was no more than 3% at any of the nine colleges at the time the survey was conducted in 2007. In addition to race and ethnicity, other student input characteristics were controlled statistically.

Intermediate Outcome Variables. Based on Pascarella's (1985) theoretical foundational model, the General Causal Model for Assessing the Effects of Differential Environments on Student Learning and Cognitive Development, students engage with the college environment and learn to use college facilities and services after they have been immersed in the immediate structural and organizational environmental characteristics such as the ones defined in the environmental variables section above. For this study, I developed two groups of intermediate outcomes variables. The first group of intermediate outcome variables was satisfaction measures with college services and engagement with college personnel, which come after exposure to the environment. The second group was measures of self-reported student engagement with the institution, which reflect the effects of both exposure to the

environment and the students' degree of satisfaction with their interactions with the college.

Student satisfaction composite variables were designed to be entered after the environmental variables but before student engagement variables. To create satisfaction variables that would serve as intermediate outcomes in the multiple regression equation, I created three satisfaction scales. I constructed these scales by averaging coded responses to identified questions in the *Spring 2007 Student Survey*. To ensure scale reliability, I computed intercorrelations between the elements of the scales to ensure that the resulting scales had Cronbach's alpha values greater than .70. The scales I constructed were (a) satisfaction with college personnel, (b) satisfaction with engagement outside class, and (c) satisfaction with facilities and services. These satisfaction measures do not parallel closely the engagement variables in the next stage of the multiple regression analysis; they reflect the limitations of the existing survey questions. The data sources in the student survey and the coding method are detailed in Appendix C.

Engagement variables. In this study, I treated engagement behaviors theoretically as a product of student entering characteristics that have been shaped by exposure to the college environment. This step is in keeping with the study's theoretical framework bounded by Pascarella's (1985) General Model for Assessing Change. According to this model, students change as a result of the interactions of their entering characteristics with socializing agents at college and as a result of the quality of student effort. Similarly, Weidman's (1989) Model of

Undergraduate Socialization combines both psychological influences and the normative effects of the social structure on student behavior.

Because the focus of the study was on exploring the possible effects of exposure to social norms, shaped in part by the composition of the student body (Akin, 2010; Bahr, 2008; Caboni et al., 2005) that lead to engagement (or disengagement) with the institution, the engagement behaviors were treated as an intermediate outcome. College impact theoretical models suggest that this engagement has an effect on student persistence. Astin's (1991) adjusted model then becomes Input-Environment-Intermediate Outcome-Outcome (I-E-O). Intermediate outcomes, while products of earlier exposure to the environment, motivate exposure to new environments and modify motivations and goals. They may be enhanced or curtailed depending on the particular normative influences. As will be noted, efforts to demonstrate these mediating effects using a hierarchical linear regression model yielded very small changes in the amount of variance explained for the dependent variable. Thus, I elected to use simultaneous linear regression models, but I still report resulting Beta values using the theoretical model that included mediating variables.

Based on Tinto's (1993) model of student departure, I divided the engagement behaviors into social and academic variables. Furthermore I divided academic engagement variables into instructional and student services variables.

To create student engagement variables that would serve as intermediate outcomes in the multiple regression equation, I created several engagement

scales. I constructed these scales by summing coded responses to identified questions in the *Spring 2007 Student Survey*. To ensure scale reliability, I computed intercorrelations and adjusted the questions included in the scale to ensure that the resulting scales had a Cronbach's alpha value greater than .70. The scales I constructed are: student services engagement, instructional engagement–In class, academic engagement—outside class, and social engagement. The data sources in the student survey and the coding method are detailed in Appendix D.

The role of norms in this research study. Community colleges serve students from diverse racial and ethnic groups, socio-economic backgrounds, immigrant and educational familial traditions, and local or national cultural and historical experiences. These different forms of student diversity at each college and the difference between college cultures and structures create a natural laboratory in which different norms can emerge, persist, and affect student behavior. Of particular interest in this study is how social norms in complex, diverse colleges encourage, shape, or impede student engagement and how that particular pattern of engagement may affect student persistence at a particular college or in attending college anywhere.

In this study, I did not attempt to describe the normative systems themselves but rather explored the presence of different student social, academic, engagement, and persistence behaviors at colleges with a broad range of racial and ethnic compositions that may be indicative of norms imported from the subcultures of society from which students come or which may have

become inherent and distinctive to an individual college's subcultures (Kuh & Whitt, 1988).

Outcomes measure. I selected student persistence as the outcome measure that was the focus of the multiple regression equation. The ideal measure is goal completion, but that measure is not practical using this research method and available data. It is not possible to determine student goals against which to define successful attainment of each student's goals. Persistence can be observed behaviorally as recurrent and repetitive, if not continuous, course taking over a period of time. The processes used to yield multiple persistence outcome measures are detailed in Chapter 4. A theoretical rationale is presented in the next section of this chapter.

Theoretical Foundations for Persistence Measures

This research study used a heuristic approach to defining applicable persistence measures. It is a practical means of defining dependent variables or outcomes measures in a multiple regression analyses of student engagement behaviors. In community college settings student goals are diverse and often not well defined, not accurately documented, or both. Additionally, these goals can change over the time that students are enrolled in college. Without well-defined goals it is difficult to ascribe measures of persistence and completion of those goals.

Multiple theoretical and practical definitions of persistence and longevity were considered in defining the dependent variables used in this study. Pascarella and Terenzini (2005) defined persistence as "the progressive

reenrollment in college, whether continuous from one term to the next or temporarily interrupted then resumed" (p. 374). This broad definition aligns with the standard for persistence used in the California Community College Chancellor's Office ARCC measures of progress that tracks the percentage of first-time students with a minimum of 12 units earned who attempt degree/certificate/transfer threshold course within 6 years of entry (2007). Similarly, McClenney and Marti (2006) defined longevity as "the number of terms enrolled and total hours completed" (p. 82). They concluded that these hybrid measures of enrollment and persistence were closely connected to engagement in academics, vocational goals and personal development. The criteria described earlier for including students in the sample are a composite of these definitions. For example the ARCC measure tracks students who completed 12 units of which six or more are in threshold courses indicating interest in a collegiate program. Since the focus of the study is on persistence behaviors that include dropping out of college, I included students in the sample who took threshold courses even if they did not complete a total of 12 units.

In Chapter 4, I describe how I constructed and tested multiple measures of persistence as dependent variables for this correlational study. I analyzed these multiple persistence measures in parallel in the absence of a single theoretically defensible measure. These measures operationalized persistence with different formulations of longevity as previously defined–terms enrolled and units completed. In these multiple formulations of longevity, I weighted consistent attendance term-to-term higher than intermittent attendance.

Constructing the multiple dependent variables was part of defining the methodology and, in fact, I used the dependent variables described in Chapter 4 to refine the multiple regression model in the analysis section of this chapter. This work is included in Chapter 4 because analyzing multiple definitions of persistence in parallel is useful to examine as a methodological innovation that is considered a finding in itself.

Data Analysis

In this section, I describe the analytical methodology used to answer the research questions and detail adjustments that needed to be made to the methodology in response to preliminary results.

Analytical approach. Seminal work on college impact models describes a formal order of entering variables into a multiple regression equation (Astin, 1993; Pascarella, 1985; Weidman, 1989). The theoretical foundations for this approach are tied to the order in which students enter college with preexisting entering characteristics, encounter an environment that affects their experience and shapes their choices, which then exposes them to further experiences. This approach can be analyzed using hierarchical linear regression methodology (HLM). HLM accounts for the chronological order in which the influences tied to these variables predict the dependent variable. In the study design section, I made the case for an Input-Environment-Intermediate Outcomes-Outcomes analysis. In testing this model, I was compelled to return to a more direct regression methodology.

Adjusted analytical methodology. In Chapter 4, I explain why I used a single block linear regression analysis rather than a hierarchical regression, which fits better with the I-E-O theoretical foundation. I outlined above my theoretical reasoning for implementing a hierarchical linear regression analysis in which input, environment, and intermediate outcome variables would be entered sequentially into the regression analysis. The sequence was based on an *a priori* assumption of how variables affect the dependent variable in chronological order. The results showed that a small change in the variance explained (ΔR^2) computed between entering input and environmental variables did not support the HLM approach with the data available for this study.

A consequence of abandoning the proposed HLM analysis was that no analytical data could be obtained to show the differential effect in explaining the dependent variable when engagement variables were entered into the hierarchical regression equation. To help answer the research question about the effects of racial and ethnic student body composition on engagement, I added a separate suite of multiple regression analyses in which various forms of engagement were the dependent variables.

Analytical measures. The results of the regression analysis were measured in two ways. First, the amount of the variance in the dependent variable that was explained by the independent variables is a measure of how well the selected independent variables collectively predict this outcomes variable. Secondly, the standardized regression variables, Beta, for each

independent variable compared its predictive power on the dependent variable with the Betas for all the other independent variables.

I chose the standardized regression coefficient, Beta (β), over the non-standardized regression coefficient, b, because this is an exploratory study. The focus of this study is to identify possible differential effects of input and environmental variables on student persistence within the study population that may influence future research and practice. The purpose is not to generalize the results to global populations. Pedhazur (1982) distinguished β from b as follows:

> β is interpreted as indicating the expected change in the dependent variable, expressed in standard scores, associated with a one standard deviation change in an independent variable, while holding the remaining variables constant. Unlike b's, β's are scale-free indices and therefore can be compared across different variables. It is this property that appeals to a great many researchers, who use their relative magnitudes as an indication of the relative importance of the variables with which they are associated." (p. 247)

The standardized regression coefficient, however, is influenced by the variance in, and covariance among, variables in the regression equation. This characteristic makes Beta less reliable than the unstandardized regression coefficient, b, when comparing the effects of independent variables in different samples. In different samples, variables can have different variances. Also, excluded variables can have different variances that are included in the error term of the regression equation. There is only one sample in this study and no

comparison is intended to results from other studies, so I chose to use Beta to identify the relative effects of independent variables used in this study on the dependent variable in this multiple regression analysis.

Refining the model. Initial single block multiple regression computations produced outputs in which various variables were automatically excluded by the statistical analysis software due to problems with collinearity. The nine dummy variables that identify the primary college for each student, the college where they took the largest proportion of their units, were found to be highly correlated with the four variables that defined the proportion at each college of the predominant racial and ethnic groups: Asian, Black, Hispanic, and White students. (Each of these four racial and ethnic proportions was entered as a characteristic associated with each student record. All students with the same primary college have four variables containing the same values for the racial and ethnic composition of that college.) I chose to remove the nine primary college dummy variables from the list of dependent variables as the variables describing the proportions of racial and ethnic student populations are key environmental factors in this study.

Additionally, the variables for the proportion of the four predominant racial and ethnic groups at each college precipitated a collinearity problem among each other as they are numerically complementary; these four variables account for close to 100% of the students at each college. Including the percentages for all four groups created a degrees-of-freedom problem because the proportions of any three racial and ethnic populations at a college predicted the fourth.

Resolving collinearity required removing one of the variables for college racial and ethnic composition. I chose to remove the variable defining the proportion of White students at each college. While White students represented between 2% and 37% of the student population at any college in this data set, for theoretical considerations, I treated White students as representative of the dominant racial and ethnic group in the society that defines the normative behaviors in society.

Sample composition. In order to finalize the sample, I first had to address potential differences between day and night student populations and the potential influence of students who held prior or "old" degrees.

Day and night student populations. I decided to treat day and night students as one population despite differences in the proportions in which they attended day and night classes by race and ethnicity. To track differences between day and night students, I included attendance at night as an environmental variable in the regression equation used in the data analysis. Students were classified as a day or night students if they took more than 50% of all classes in the period of this study at any college in the study in the daytime or nighttime. Under this classification, 84% of students in the sample were defined as day students.

A crosstabulation of the district-wide sample showed that racial and ethnic student groups differed in their attendance as primarily day or night students (χ^2 = 79.56, df = 3, N = 14,954, p = .000). In the district-wide sample and at six of the nine colleges, Chi Square analyses demonstrated a significant difference in day and night attendance between the racial and ethnic groups.

Students with old degrees and students without. The analyses for this study were conducted excluding students in the original sample who held prior degrees or had transferred to university prior to the study period. This section describes how students with old degrees were shown to be a different population than students without old degrees. As the focus of this study was on the effects of engagement behaviors that are learned in college due to normative pressures of the peer group, I excluded the participants who held old degrees from the analysis.

Once persistence models were defined, it became possible to use the linear multiple regression analysis to test the persistence behavior of different segments of the student population. I defined students with old degrees as those who entered the community colleges in this study reporting that they already held an associate degree or higher, or whose student records indicated they had transferred to any four-year institution in the year 2001 or earlier, prior to the period of records collection: fall 2001 to fall 2012.

I computed the suite of eight regression analyses for three groups: (a) students with old degrees, (b) students who did not possess a degree nor had reported transferring prior to fall 2001, and (c) the two groups combined. The result of the eight regression analyses showed consistently that excluding students with old degrees from the sample lowered slightly the variance explained compared to the regression computation in the combined group. Table 5 shows the effect of excluding students with old degrees from the sample on the variances explained in dependent variables by each of the eight regression

computations. However, Beta values for numerous independent variables differed in both scale and sense between the group of students with old degrees and the groups without, thus indicating that the two groups differed considerably. Appendix G contains tabulations and graphical representations of the Betas for independent variables from multiple regression analyses computed separately for these two populations.

Table 5

Comparison of Variance Explained for Samples Including and Excluding Students with Prior Degrees

Persistence Model	Adjusted R^2 Old Degree Holders Included	Adjusted R^2 Old Degree Holders Excluded
Ordinal Model 1	.151	.135
Ordinal Model 2	.159	.145
Ordinal Model 3	.151	.136
Ordinal Model 4	.202	.200
Ordinal Model 5	.217	.215
Scalar Model 1	.250	.249
Scalar Model 2	.176	.171
Scalar Model 3	.265	.261

Student records for students holding old degrees had less consistent records reinforcing the decision to exclude them from the study. These students were excluded from the regression computation at a much higher rate due to listwise deletion. Students with old degrees included by the analysis software because their data were complete (N = 247) represented 8.3% of all students with old degrees in the sample. This contrasts unfavorably with students without old degrees who were included in the regression computation (N = 9,331) who represented 58.3% of all students in the sample without old degrees. Because I used listwise deletion in computing the multiple regression analysis, this suggests many students with degrees are lacking some data in the database. It may also indicate that these 247 cases are not representative of students with degrees, which is a further reason to exclude them.

Chapter Summary

To examine the effects of student body racial and ethnic demographics on student engagement and persistence, I have identified and refined a large data set comprising samples of student survey data and academic records from nine urban and suburban community colleges. In this chapter, I have justified multiple regression as a correlational inferential analytical methodology to control for students' entering characteristics, including student racial and ethnic identity, and for environmental variables that are expected to share in predicting engagement and persistence with the colleges' demographics.

To refine the methodology and focus Chapter 4 on answering the research questions, in this chapter, I began a discussion of the steps I took to refine both the data and the methodology. For example, in the section on analysis, I discussed the decision to select out classes of students who did not fit within the scope of the research questions, such as those who had already received degrees and/or transferred. I then described how I selected or constructed and refined independent variables for the analysis and began the statistical analytical work. I adjusted the methodology to account for statistical problems with collinearity in the data set. Finally, I abandoned the hierarchical linear modeling methodology that was justified by college impact models in favor of single block linear multiple regression; small effects did not justify entering input and environmental variables sequentially into the analysis.

CHAPTER 4

RESULTS

This chapter contains two major elements: I describe how I refined the methodology described in Chapter 3 and present results of the multiple regression analyses that was used to respond to the research questions. The methodology refinements included designing a method to measure dependent variables for two series of outcomes: engagement and persistence. The approach, labeled here Omnibus Outcomes Measure Approach, relies on identifying consistent patterns of significance of independent variables in explaining variance in a series of multiple regression analyses. In each series of eight dependent variables, the formulation of these dependent variables emphasized various characteristics of the dependent variable being studied—persistence or engagement. This Omnibus Outcomes Measure Approach is intended for use in an exploratory fashion to help design outcomes measures for future organized research. It also allows an exploratory study of the effects of independent variables on these outcomes measures in an opportunistic research analysis of existing data about community college students over the course of multi-year enrollments. This methodology extends the typical study of engagement and persistence to full-time and part-time students and beyond the typical study of the first year. Thus, it helps to describe the typical community college experience, especially in urban, low socio-economic status communities.

This approach extends beyond the traditional full-time, first year persistence studies that replicate the study of student behaviors at four-year institutions.

The first part of the chapter details the multiple definitions of the dependent variables; it contains a description of how these variables were refined and reduced to be representative of multiple measures. This section describes how the Omnibus Outcomes Measure Approach was used to refine the sample of students included in the study and to reduce the independent variables to those that significantly and consistently predicted the multiple definitions of the persistence outcomes measure. The latter sections present the results of multiple regression analyses using the omnibus outcomes measures of engagement and persistence that will be used to answer the research questions.

Refining the Regression Equation

This linear multiple regression analysis relied on adequately defining an outcome measure, persistence. The dependent variable, persistence, must meaningfully and in a methodologically justifiable manner link the previously defined independent variables, input characteristics and environmental variables. The results of the regression analyses conducted here show which and to what extent the independent variables influenced or predicted the outcomes measure.

Because the data set that I acquired did not contain reliable information on student goals or any measures of persistence, I devised a suite of eight persistence measures computed from observed, measurable student behaviors. Student behaviors that I used included the length and consistency of attending semesters of college, the course loads they took, and degree and certificate

completion and/or transferring to four-year institutions. By examining the patterns of significance among the independent variables that statistically predict the different formulations of the dependent variable, persistence, I refined the persistence models. I also reduced the number of independent variables introduced in the data analysis section of Chapter 3 to those that consistently The methodology below shows how I chose to retain significant independent variables in the analysis, and ultimately which of the eight definitions of persistence I retained as complementary drivers of the multiple regression analysis.

Dependent Variable Selection

Persistence was selected as the output measure, or dependent variable, in the multiple regression equation. This dependent variable was originally selected through a combination of theoretical foundations (Astin, 1984; Pascarella, 1985; Tinto, 1987; Weidman, 1989) and practical considerations given the data available (McClenney & Marti, 2006). In this section, I detail how a suite of eight variants of the persistence measure was defined and computed for this multiple regression analysis to operationalize the output variable proposed in Chapter 3. The tabulation of the independent variables initially entered into the regression equation can be found in Appendix B.

No one model of persistence could be derived that was consistent with theory and that could reflect the diverse student background characteristics, behaviors, exposure to college environments, and college experiences. The data, which were derived from the *Spring 2007 LACCD Student Survey* and from

the college application and enrollment records of students taking the survey, do not lend themselves to precise outcomes measurement because the goals in which students would be said to persist are not clearly defined. An ensuing section will show that educational goals identified in the student survey were not found to significantly predict the multiple measures of persistence. Additionally, no data were directly gathered for this study that could have solicited participants' goals or the degree to which they may have achieved them. Further, participants in the study included all students who took the 2007 survey regardless of their stated goals or their observed term-to-term attendance patterns.

Given the nature of the data used and the diversity of student behaviors, multiple measures of persistence were derived. These were then refined using the results of multiple regression analyses to identify the one persistence measure in each of three classes of measures that explained the highest amount of variance in the regression equation.

Classification of Persistence Measures

I defined eight measures of persistence divided into three classes. The syntax files in Appendix E detail how these measures were defined and computed in statistical analysis software, SPSS. Table 6 summarizes the characteristics of the eight persistence measures.

Table 6

Classifications and Characteristics of Persistence Measures

Persistence Scale	Conceptual Basis	Characteristics
Class 1		
Ordinal Measure 1	▪ Consistent attendance ▪ Completion	▪ Completed degree/certificate or transferred to university ▪ Attended consistently term to term, full-time or close to full-time
Ordinal Measure 2	▪ Consistent attendance ▪ Completion	▪ Completed degree/certificate or transferred to university ▪ Attended consistently term to term, full-time or close to full-time ▪ Attended 2-3 terms
Ordinal Measure 3	▪ Consistent attendance ▪ Completion	▪ Completed degree/certificate or transferred to university ▪ Attended consistently term to term, full-time or close to full-time ▪ Measure weights more heavily for attending consistently for 2-3 terms
Class 2		
Ordinal Measure 4	▪ Consistent attendance ▪ High units	▪ Measure weights consistent term to term attendance over high unit intermittent course-taking ▪ Completions not measured
Ordinal Measure 5	▪ Consistent Attendance ▪ High units	▪ Consistent term to term attendance ▪ High unit course -taking ▪ 3 or more terms taking high unit counts ranked higher than 1-2 terms/high units ▪ Completions not measured
Class 3		
Scalar Measure 1	▪ Consistent attendance ▪ High units	▪ Average units ÷ span factor[a]
Scalar Measure 2	▪ Consistent attendance ▪ High units	▪ Proportion of terms taking 6 or more units ÷ span factor
Scalar Measure 3	▪ Consistent attendance ▪ High units	▪ Proportion of terms taking 9 or more units ÷ span factor

[a]Span factor = the span of terms (most recent term – first term) ÷ the number of terms in which the student attempted classes.

Class 1 persistence measures. The first class of measures consisted of three ordinal measures, each of which included completion as a part of its calculation.

Ordinal persistence measure 1. This is an ordinal persistence measure that rates certificate and associate degree completion and transfer highly. This measure gives the highest rating to any completion measure achieved without breaks in attendance semester-to-semester. Consistent attendance with higher unit-taking is rated highly in this formulation but is rated lower than any documented completion/transfer.

Ordinal persistence measure 2. Similar to the first ordinal persistence measure, this measure gives high rating to completion and transfer and to consistent semester-to-semester attendance with high units. This measure accounts for possible unrecorded completion of skills certificates or focused individual education goals for which there is no formal recognition. This was achieved by assigning a higher persistence score to consistent attendance for two to three semesters with half-time or higher units attempted where there is no documented formal outcome. This behavior would otherwise be ranked at the lowest persistence score as "stopped" attending.

Ordinal persistence measure 3. As with the first two ordinal persistence measures, this measure accounts for attendance and consistency behaviors. However, it included an even higher rating than Ordinal Persistence Measure 2 to possible unrecorded completion of skills certificates or individual goals as described by attending two to three semesters while taking half-time or more units with no breaks in attendance.

Class 2 persistence measures. This class of measures was similar to the first class in that each measure was ordinal. However, these measures

emphasized persistent completion of a higher number of units rather than certificate or degree completion or transfer.

Ordinal persistence measure 4. This ordinal persistence measure ranked only attendance behaviors, not certificate or degree completions or transfer. This measure gave higher rank for persistent course taking of relatively high units over a two-to-three semester span of terms than some less consistent, intense course-taking patterns.

Ordinal persistence measure 5. This is an ordinal persistence measure that ranked lowest the persistence of students who attended three or fewer terms. These students were rated lower than in Ordinal Persistence Measure 4 for relatively intense, short-term course-taking. Half-time or higher unit-taking and continuous enrollment over two to three semesters was still ranked higher than intermittent and/or low average unit-taking.

Class 3 persistence measures. Similar to the second class, the third class of persistence measures were based on attendance only and not completion measures. The difference is that I based persistence measures in this class on algorithms that yielded scalar variables. Central to the algorithms was a span factor, which I discuss first followed by descriptions of the three persistence measures in this class.

Span factor. All three scalar persistence models give higher persistence scores to more regular term-to-term attendance. This was achieved by dividing by a span factor—a quotient of the total span of primary terms from first to last semester attempting classes and the number of terms when students actually

attempted classes. The lowest value of this span factor quotient was 1.0, which was achieved if a student attempted classes every semester from first to last attendance. Any skipped term increased the value of the span factor and thereby decreased the scalar value of the persistence measure. This can also be described as raising the persistence score the fewer the terms during the span of terms attended when students did not attempt classes. Thus, the span factor was calculated as dividing the span of terms attended by the number of terms in which the student attempted classes.

In this study, a little over half the students included in the analysis (52.4%) had a span factor value of 1.0 indicating that they did not have any breaks in their attendance. The mean span factor was 1.24 and standard deviation 0.464 (N = 13,025); on average, students dropped out one out of five of the terms between first and last enrollment.

Scalar persistence measure 1. This scalar persistence measure adhered most closely to McClenney and Marti's (2006) "longevity" approach. It averaged units attempted over the number of terms in which students attempted classes.

Scalar persistence measure 2. This scalar persistence measure emphasized course taking patterns, counting the proportion of terms attended in which students attempted six or more units.

Scalar persistence measure 3. This scalar persistence measure also emphasized course taking patterns, but counted the proportion of terms attended in which students attempted nine or more units.

Reducing Variables

In this section, I describe two iterations of reducing independent variables from the regression equation. Both are based on the significance of the Betas of these variables across the eight models.

Education goals. A review of the significance of the standardized regression coefficients, Beta, in the eight regression analyses shows that no education goal was significant across all persistence goals. As reported in Table H1 in Appendix H, only one independent variable, education goal: certificate/degree without transfer, was significant at $p < .05$ under more than one model. Nonetheless, all education goals were removed from the regression equation because, as shown in Table H2 in Appendix H, the reduction in the variance explained from removing the independent variables for the six education goals from any of the eight regression models was no more than 2%.

The six self-reported education goal variables were removed as a conceptual assessment of their collective applicability to this analysis. The resulting minor reduction in the explained variance was deemed acceptable. In the next section, several variables are evaluated for removal individually.

Removing other independent variables from the equation. Data reported in Table H3 in Appendix H also show that several independent variables have Beta values that are significant under one or two of the persistence classes but not all three. For example, Betas for gender (female) are not significant in analyses where the dependent variable models are Class 1 models of persistence that account for measures of completion and transfer. The same

was true for the variables: not US citizen, married, and percent of units taken at primary college. Conversely, race/ethnicity – Asian had significant betas only under Class 1 models. Other independent variables exhibited less clearly defined patterns of significant Betas that did not conform with the classes of models of persistence.

As there were likely to be implications for the study under these different models, I focused on testing for removal from the multiple regression equation only variables whose Betas were not significant under any of the eight models of persistence. The five independent variables that were eliminated were: have children, have disability, large primary college, scale-academic standards, and scale-satisfaction college personnel. Data in Table H4 in Appendix H demonstrate the justification for eliminating these variables. They show that removing each of these variables does not reduce the variance explained by the multiple regression equation.

Selecting Representative Persistence Models

In this section, I provide justification for choosing three of the eight persistence models with which to proceed for the remainder of the study. Up to this point, for each step in the analysis I conducted eight multiple regression computations in parallel. Results from the eight separate multiple regression analyses were tabulated to compare the predictive value of using each of the output measures on the independent variables. Table 7 shows the adjusted variance value, the ANOVA *F*-test statistic, and significance levels for all eight

models after I eliminated the five independent variables as reported above. In each case, the *F* statistic was significant at $p < .001$.

Table 7

Adjusted R^2 and F-Test Values for Regression Analyses Using the Eight Persistence Measures

Persistence Measure	Adjusted R^2	*F*	*p*
Class 1			
Ordinal Measure 1	.133	47.313	.000
Ordinal Measure 2	**.142**	51.077	.000
Ordinal Measure 3	.133	47.475	.000
Class 2			
Ordinal Measure 4	.199	76.293	.000
Ordinal Measure 5	**.214**	83.262	.000
Class 3			
Scalar Measure 1	.246	99.753	.000
Scalar Measure 2	.169	62.711	.000
Scalar Measure 3	**.260**	107.161	.000

Note. Degrees of freedom were 31, 9,359. Variance displayed in **bold** type shows the highest value in each persistence class.

I selected one persistence measure from each of the three classes of persistence measures described above based on the variance explained and the ANOVA *F* statistic value. The three resulting measures were Ordinal Measure 2 from Class 1, Ordinal Measure 5 from Class 2, and Scalar Measure 3 from Class 3. For the sake of clarity, I will refer to these as Ordinal Measure-Completion, Ordinal Measure-Units, and Scalar Measure-Units throughout the remainder of this document. In the earlier review of independent variables eliminated from the equation, and as will be shown in the discussion of the results of the regression analyses, the standardized regression coefficient values, Beta, for the independent variables did not predict the persistence

measures sufficiently uniformly between models. Consequently, I did not select one persistence measure as the only dependent variable in a single regression equation for this study. There appeared to be more to be learned about different student engagement and persistence behaviors by running the analyses with different definitions of the dependent variable, persistence.

Further justification for choosing the three persistence models listed above comes from a visual inspection of the significance values of the remaining independent variables in the equation. Data in Table 9 denote the significance of the Betas for the variables in the regression equations used in this analysis after removing the five variables listed above. The data confirm that some variables are significant under some classes of regression models but not others. Table 9 shows operationally consistent significance of Betas from the representative model of each of three classes of persistence measures described. A few Betas were significant in some models but not in the selected regression models. Nonetheless, the exploratory nature of this study justifies selecting only one model from each of the three classes of persistence variables.

Multiple Regression Analysis

Analysis of the Regression Model

In the methodology chapter, I outlined a hierarchical linear regression analytical approach, which reflected the theoretical basis of the study. Based on a traditional college impact approach, there is presumed to be a chronological order in which independent variables, and the associated student experiences, influence student outcomes. I found that the hierarchical linear regression

method that I intended to use did not produce useful results. Table 8 shows that the variance explained even in two hierarchical steps in which input characteristics and environmental factors are entered in sequence was not justified. The small additional variance explained in the second step did not warrant an analysis based on a two-step hierarchical approach, and certainly not the three steps of entering variables into the regression equation. Consequently, I used a single block multiple regression analysis.

Table 8

Variance Explained in the First and Second Steps of a Two-Step Hierarchical Linear Regression Model

Persistence Measure	R^2 for Input Variables	*F*	ΔR^2 for Environmental Variables	*F*
Ordinal Measure—Completion	.118	51.467	.024	51.077
Ordinal Measure—Units	.206	98.271	.008	83.262
Scalar Measure—Units	.249	125.684	.011	107.161

Effects of Student Body Racial Composition on Student Persistence

The first research question considers the effects of student body racial and ethnic composition on student persistence. Table 9 lists the standardized regression coefficients, Beta, for the three single-block multiple regression analyses on the three selected measures. Significance values are also listed. They are grouped by input, environment, and intermediate output variables. This approach was discussed in the Chapter 3 in keeping with Astin's (1991) extended I-E-O model for multiple regression analyses. As the independent

variables were entered into the multiple regression analysis in a single block, the implication of this ordering is only theoretical and will be discussed in the next chapter.

Table 9

Standardized Regression Coefficients and Significance Values for Single-Block Regressions on Three Persistence Outcomes

	Ordinal—Completion		Ordinal—Units		Scalar—Units	
Independent Variable	β	*p*	β	*p*	β	*p*
Input Variables						
Gender	-.007	.499	**-.043**	.000	**-.058**	.000
Age	**-.068**	.000	**-.050**	.000	**-.111**	.000
Asian	**.041**	.016	.029	.068	.020	.199
Black	**-.076**	.000	**-.040**	.009	**-.035**	.018
Hispanic	**-.094**	.000	-.040	.196	**-.068**	.001
White	.027	.116	**.037**	.024	**.037**	.019
Not a U.S. Citizen	-.006	.650	**.055**	.000	**.082**	.000
English is not Primary Language	**.043**	.001	.011	.362	**.035**	.003
Relative Family Resources	**.074**	.000	**.029**	.006	**.036**	.000
Entering Preparation Skills	**.058**	.000	**.038**	.000	**.045**	.000
Time Lived in the U.S.	.007	.653	.018	.204	**.036**	.009
Marital Status	-.009	.403	**-.033**	.001	**-.041**	.000
Parental Education	.019	.108	**.029**	.011	**.039**	.001
High School Diploma	**.066**	.000	**.074**	.000	**.051**	.000
Lowest Level Math Taken	**-.096**	.000	**-.154**	.000	**-.092**	.000
Lowest Level English Taken	**-.075**	.000	**-.162**	.000	**-.097**	.000
Lowest Level ESL Taken	**-.038**	.001	**-.097**	.000	**-.102**	.000
Environmental Variables						
% Asians at Primary College	**-.073**	.000	**-.061**	.000	**-.058**	.000
% Blacks at Primary College	**-.133**	.000	**-.093**	.000	**-.092**	.000
% Hispanics at Primary College	**-.088**	.000	**-.062**	.000	**-.095**	.000
% units at primary college	.001	.943	**.041**	.000	**.094**	.000
% of courses taken at night	**-.071**	.000	**-.131**	.000	**-.196**	.000
% online classes	**.052**	.000	**.023**	.015	.004	.659
% terms on financial aid	**.131**	.000	**.138**	.000	**.161**	.000
Work Hours per week	**-.040**	.000	**-.069**	.000	**-.124**	.000

Table 9 (continued)

Independent Variable	Ordinal—Completion β	Ordinal—Completion *p*	Ordinal—Units β	Ordinal—Units *p*	Scalar—Units β	Scalar—Units *p*
Intermediate Outcomes						
Satisfaction—Engagemnt Outside Class	**-.023**	.029	-.018	.064	-.006	.525
Satisfaction—Facilities Services	**-.058**	.000	-.017	.077	**-.034**	.000
Engagement with Student Services	**.067**	.000	**.060**	.000	**.065**	.000
Engagement in Class	**.026**	.025	**.033**	.003	**.028**	.009
Academic Engagement Outside Class	**.046**	.000	.026	.501	.004	.748
Social Engagement	**.087**	.000	**.040**	.000	**.056**	.000

Note. Ordinal-Completion—$F(31, 9{,}359) = 51.077$, $p = .000$; $R^2 = .142$; Ordinal-Units—$F(31, 9{,}359) = 83.262$, $p = .000$; $R^2 = .214$; Scalar—Units—$F(31, 9{,}359) = 107.161$, $p = .000$; $R^2 = .262$. Significant Betas are displayed in **bold** type.

Figures 2, 3, and 4 present the Betas for input variables, environment variables, and intermediate output variables in bar charts with values for the three persistence measures clustered.

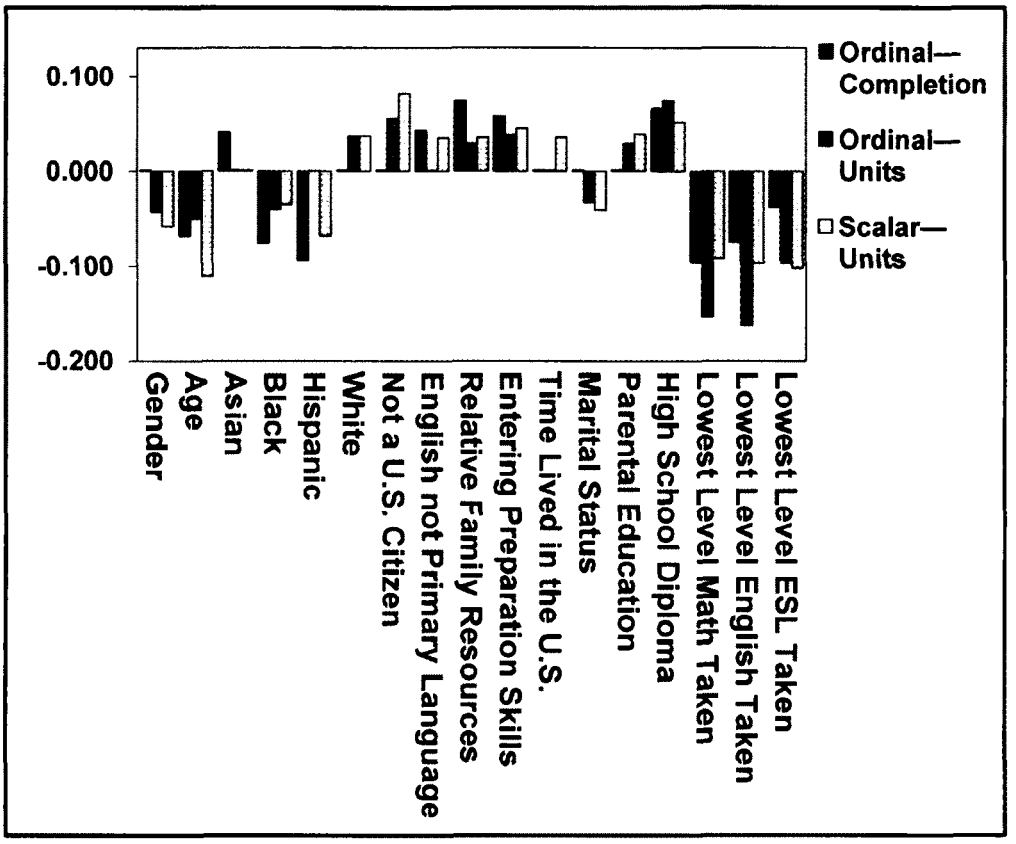

Figure 2. Betas for input variables clustered by the three persistence outcome measures. Non-significant values ($p > .05$) are presented as zeros.

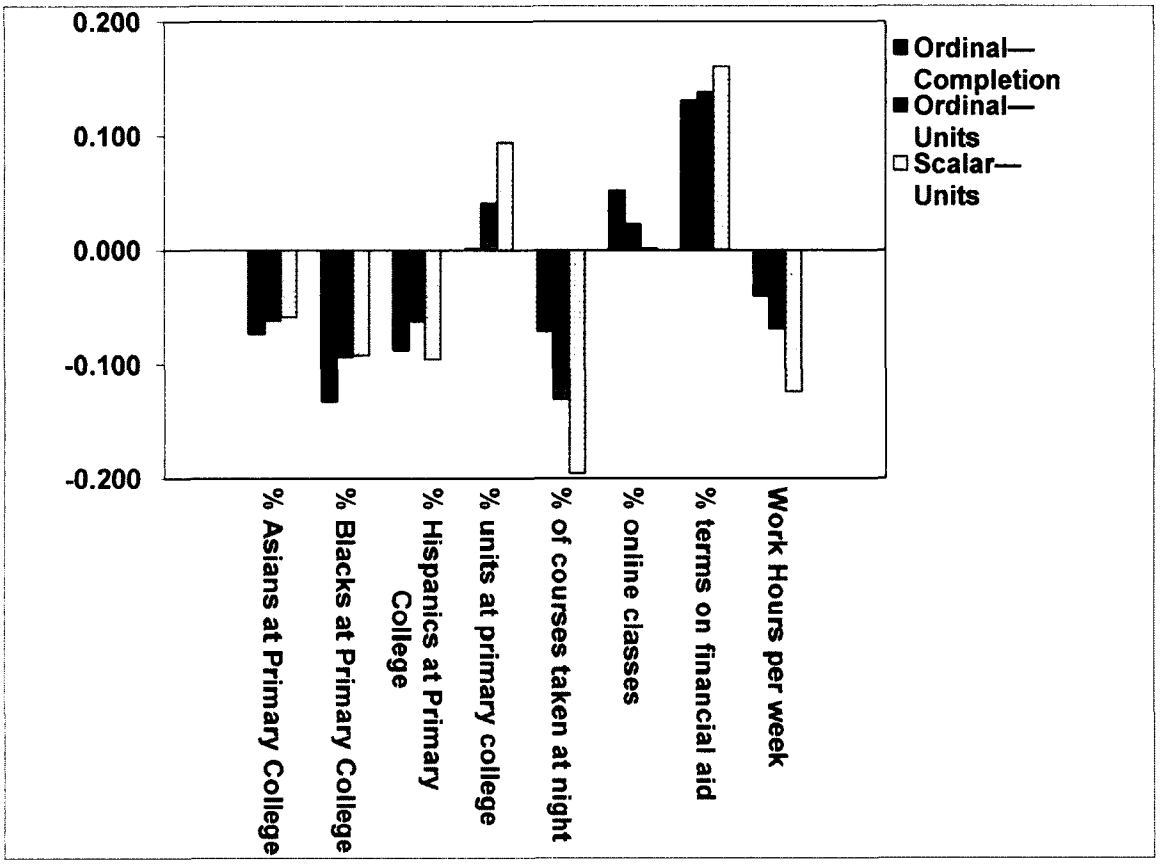

Figure 3. Betas for environmental variables clustered by the three persistence outcome measures. Non-significant values ($p > .05$) are presented as zeros.

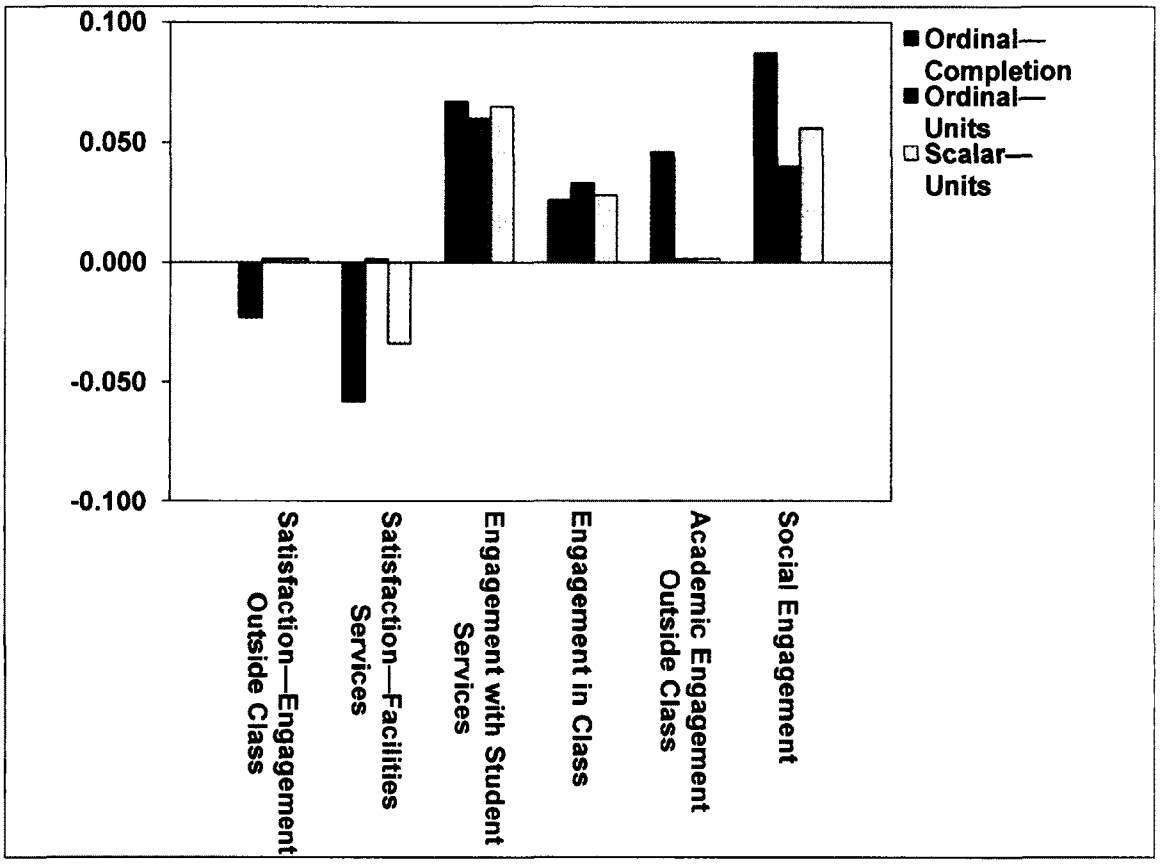

Figure 4. Betas for intermediate outcome variables clustered by the three persistence outcome measures. Non-significant values ($p > .05$) are presented as zeros.

Figure 5 presents the Betas for student racial and ethnic identity and college racial and ethnic composition in a bar chart with values for the three persistence measures clustered.

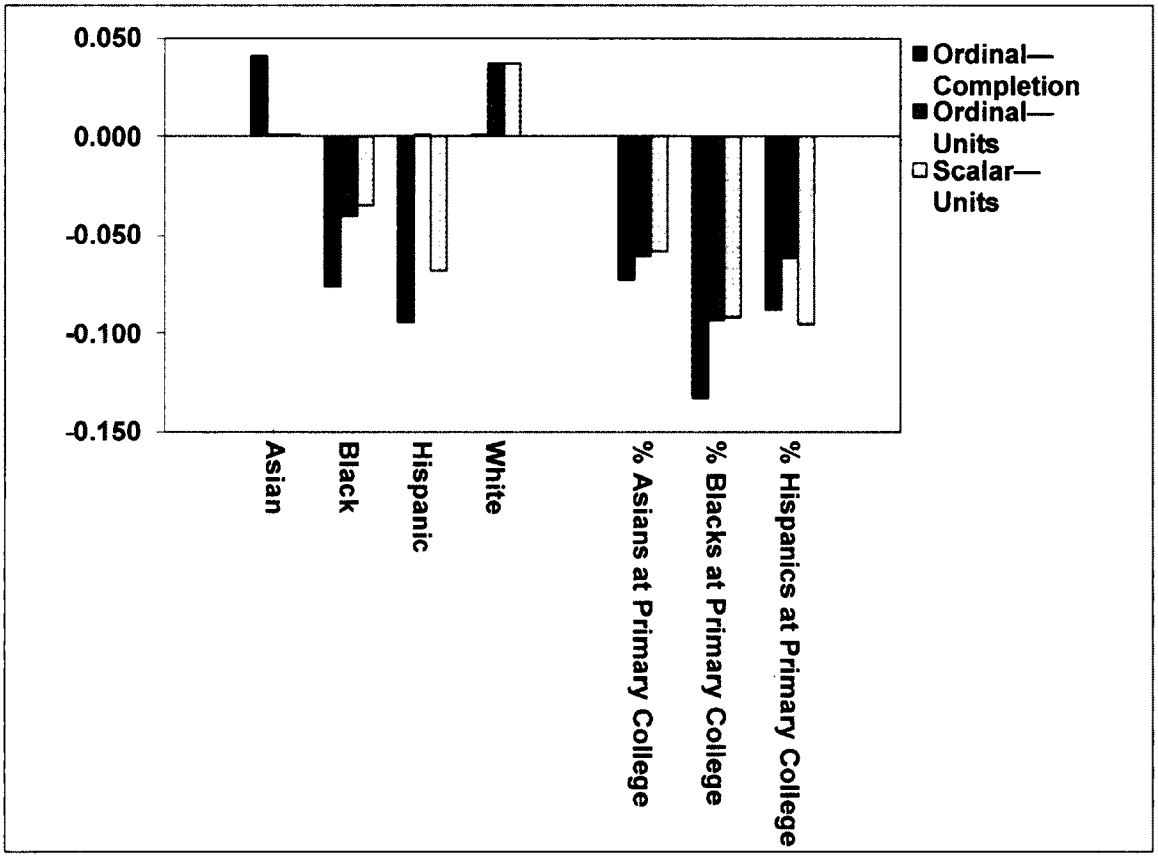

Figure 5. Betas for race and college racial composition variables clustered by the three persistence outcome measures. Non-significant values ($p > .05$) are presented as zeros.

Effects of Student Body Racial Composition on Student Engagement

The third research question probes the effects of student body racial and ethnic composition on student persistence. The analytic results are presented after the first question to allow for comparison of the parallel methodology.

I conducted a separate regression analysis to examine the effects of student body racial and ethnic composition on student engagement. Four composite scales of engagement were used as dependent variables in separate

linear multiple regression analyses: Engagement with student services, engagement in class, academic engagement outside class, and social engagement. Significant standardized regression coefficients, Beta, for the dependent variables entered into these single-block regression analyses are tabulated in Table H5 in Appendix H. Table 10 shows the variance explained in each analysis. In each case, F (41, 9803) is significant at $p < .001$.

Table 10

Adjusted Variance and F-test Values in Regression Analyses Using Four Engagement Measures

Dependent Variable	Adjusted R^2	F	p
Engagement with Student Services	.224	67.680	.000
Engagement in Class	.210	65.211	.000
Academic Engagement Outside Class	.262	86.989	.000
Social Engagement	.074	20.126	.000

It was outside the scope of this study to examine the predictive power of all 41 independent variables. Unlike the persistence analyses, no attempt was made in the study of student engagement to reduce the dependent variables to a common set across all engagement measures; engagement variables measure different behaviors while the different persistence scales were meant to measure the same behavior with different approaches. Rather, a broad range of independent variables was entered into the multiple regression equations to explain variance in the engagement dependent variables. These independent variables are justified for theoretical reasons in this exploratory study. They explained variance that might otherwise appear to be explained by the student

body racial and ethnic composition independent variables that are of interest in this study.

Table 11 lists the Betas for two groups of independent variables in the multiple regression equations. The first group comprises independent variables with Betas that were notable for their size or for comparison with independent variables in the earlier analyses of persistence. These are included in this table to provide context for the predictive power of the second group of variables, the percent of Asian, Black, or Hispanic students at the student's primary college, on the engagement dependent variables. The two groups were separated for ease of interpretation but were all entered together into a single-block linear multiple regression analysis.

Figure 6 displays the Betas from Table 11 for the most prominent independent variables. These are compared to the Betas for the racial and ethnic demographics independent variables.

Table 11

Standardized Regression Coefficients of Selected Independent Variables for Single-Block Regressions on Four Engagement Dependent Variables

	Engagement with Student Services		In Class Engagement		Academic Engagement		Social Engagement	
	β	*p*	β	*p*	β	*p*	β	*p*
Independent Variables								
Age	.070	.000	.070	.000	.043	.000	.042	.001
Asian	.038	.019	-.043	.006	-.045	.003		
Black	.039	.010						
Hispanic			-.051	.011	-.094	.000		
White								
Family Resources	-.056	.000			-.023	.022	-.031	.005
Entering Prep. Index	-.063	.000	.070	.000			-.027	.012
Parental Education	.027	.019	.066	.000	.061	.000	.072	.000
No. of Terms Attended	.062	.000	.061	.000	.074	.000	.049	.000
Proportion 6+ Unit Terms					-.030	.017	-.054	.000
Proportion 9+ Unit Terms	.102	.000	.078	.000	.084	.000	.119	.000
Percentage of terms on Financial Aid	.182	.000	.030	.004	.037	.000	.030	.008
Acad. Standards Scale	.192	.000	.347	.000	.369	.000	.165	.000
Satisfaction—Personnel			.132	.000	.208	.000	.045	.000
Satisfaction—Facilities	.110	.000			.026	.006	.038	.000
Student Body Composition at Primary College								
Percent Asian							.029	.035
Percent Black			.063	.000	.048	.003	.076	.000
Percent Hispanic			.070	.000	.031	.014	.052	.000

Note. Engagement with Student Service, $F(41, 9456) = 67.680$, $p = .000$, $R^2 = .224$; In Class Engagement, $F(41, 9859) = 65.211$, $p = .000$, $R^2 = .219$; Academic Engagement, $F(41,9875) = 86.989$, $p = .000$, $R^2 = .262$; Social Engagement, $F(41, 9816) = 20.126$, $p = .000$, $R^2 = .074$.

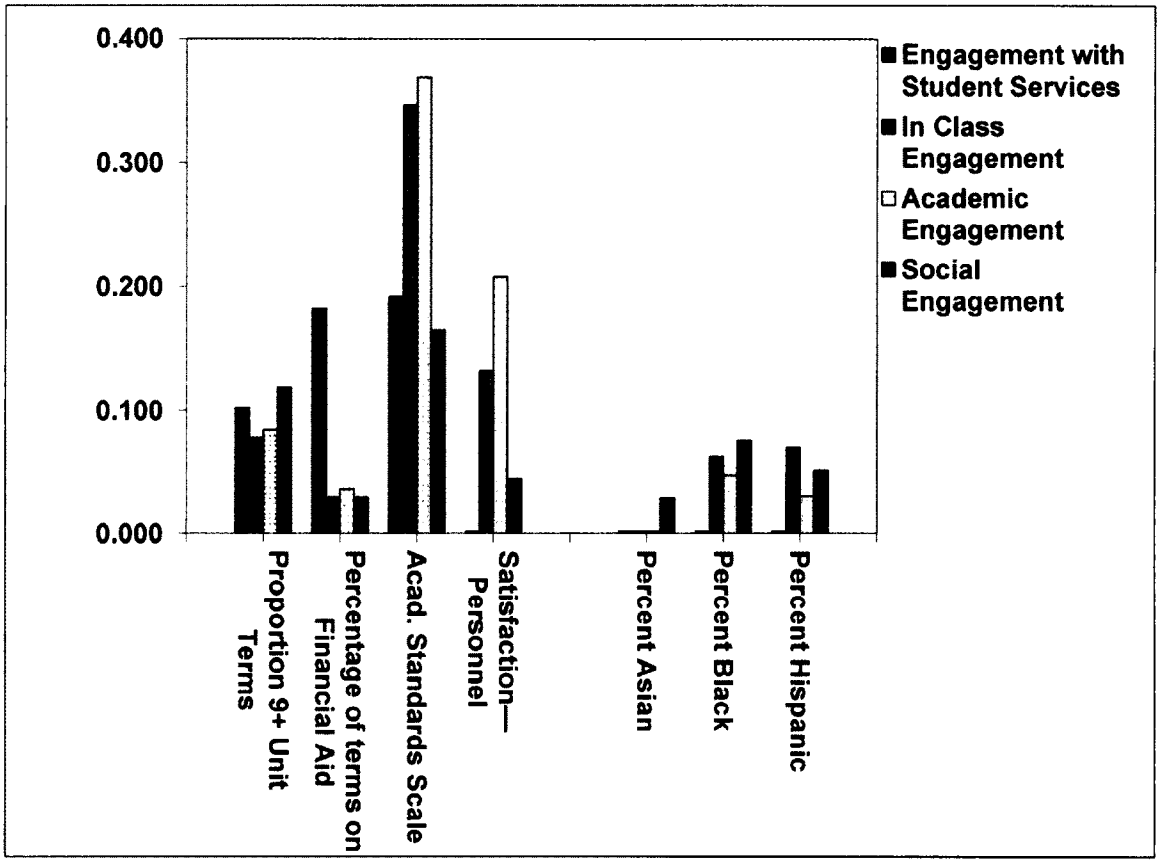

Figure 6. Betas for prominent environmental variables and student body composition variables clustered by the four engagement outcome measures. Non-significant values ($p > .05$) are presented as zeros.

Interaction Effects of Student Race and College Race

The second research question examines the existence of differential effects on students from different races or ethnicities based on the racial and ethnic composition of their colleges. Student body racial and ethnic composition was found to have a significant effect in the preceding analysis of persistence. The variable for the percentage of the student body of Asian, Black, or Hispanic students had a negative effect on each of the three representative persistence models. The larger the percentage of any racial group the lower the persistence.

To further explore this, I first examined the representation of various racial groups of students as disaggregated by the dominant racial group at the campus,

Black, Hispanic, or mixed. Table 12 lists the counts and percentages within the sample of valid student race to college predominant population interaction pairs. Some of the counts and percentages are low even in a sample of 12,141. This observation creates room to discuss the diversity of the student population.

Table 12

Interaction Effects Variables between Predominant Student Identity Characteristics and Major Student Racial and Ethnic Population Factors

	Representation at Predominantly Black Colleges		Representation at Predominantly Hispanic Colleges		Representation at Predominantly Mixed Colleges	
Student Race	*N*	%	*N*	%	*N*	%
Asian	11	0.1	557	4.3	1,315	10.1
Black	457	3.5	357	2.7	783	6.0
Hispanic	160	1.2	3,368	25.9	2,896	22.2
White	10	0.1	160	1.5	2,037	15.6

Note. N = 12,141; 884 missing cases are "decline to state" or not members of the four predominant racial groups used in this study.

Bivariate ANOVA analysis of difference between levels. I next created 12 dummy variables, one for each cell in Table 12 (e.g., Asian at a predominantly Black college, Hispanic at a predominantly mixed college). I used these 12 dummy variables as independent variables in a one-way ANOVA testing for differences in scalar persistence—units outcome measure.

There was a significant interaction between the effects of student race and ethnicity and college predominant population on persistence. The overall ANOVA was significant, F (11, 12129) = 35.993, p < .001, eta = .18, so there are differences among the interactions and a small to medium effect size. The

assumption of homogeneity of variances of the twelve levels was violated as indicated by a significant Levene's test so a Games-Howell post hoc test was used to inspect significant differences between the different interactions. Table 13 shows the interactions that differed significantly from each other.

Table 13

Interactions Between Student Race and Ethnicity and College Predominant Populations that Exhibited Significantly Different Effects on Persistece

Paired Comparisons for the Scalar Persistence—Units Measure			
High Scoring Group	Low Scoring Group	Mean Diff.	*p*
Asian at Mixed College (M = .63)	White at a Hispanic College (M = .47)	.154	.000
	Hispanic at a Hispanic College (M = .49)	.139	.000
	Hispanic at a Mixed College (M = .50)	.128	.000
	Black at a Mixed College (M = .54)	.092	.000
	Black at a Hispanic College (M = .54)	.091	.000
	Black at a Black College (M = .54)	.088	.000
Asian at Hispanic College (M = .62)	White at a Hispanic College (M = .47)	.148	.000
	Hispanic at a Hispanic College (M = .49)	.133	.000
	Hispanic at a Mixed College (M = .50)	.122	.000
	Black at a Mixed College (M = .54)	.086	.000
	Black at a Hispanic College (M = .54)	.085	.003
	Black at a Black College (M = .54)	.082	.003
White at Mixed College (M = .61)	White at a Hispanic College (M = .47)	.139	.000
	Hispanic at a Hispanic College (M = .49)	.125	.000
	Hispanic at a Mixed College (M = .50)	.113	.000
	Black at a Mixed College (M = .54)	.078	.000
	Black at a Hispanic College (M = .54)	.077	.001
	Black at a Black College (M = .54)	.074	.001
Black at Mixed College (M = .54)	Hispanic at a Hispanic College (M = .49)	.047	.010

Note. Pairs are only presented when mean differences are statistically significant ($p < .05$).

The ANOVA paired comparisons of significantly different levels of interactions of student race and ethnicity with college predominant populations show a persistent pattern of differences between the interaction effects of Asian

students with predominant college populations and the interaction effects of all other student racial and ethnic groups with the college populations. There was a comparable although less comprehensive pattern of differences between the interaction patterns of White students and those of Black and Hispanic Students. Black and Hispanic students had fewer differences in their interactions with their college racial and ethnic populations.

In view of the earlier analysis, I studied only interactions of student race and ethnicities with the racial and ethnic population groups that were predominant at any of the colleges. The variances explained in these analyses were relatively small considering the large number of independent variables. In the previous section, I described a series of multiple regression analyses that were conducted based on several definitions of persistence used as the dependent variable. Table 9 showed that the 31 independent variables that were ultimately left in the equation explained between .142 and .260 of the variance. Most of the independent variables had significant standardized regression coefficients, Beta, in each of the three representative regressions retained. The small incremental variance shown in Table 13 indicated that only small effects would be discerned in this analysis. I therefore chose to limit the analysis of interaction effects to broad population characteristics of the colleges.

Multiple regression analysis of interaction effects. Table 14 lists the Beta values from the single block multiple regression analysis that includes the 12 variables for the interactions of student race with campus population. The variables were grouped into input, interaction effects (which are a combination of

input and environmental variables), environment, and intermediate outcomes. The order of display is for clarification and does not imply any analytical order since all variables were entered into the multiple regression equation in one block. Note that the Beta values for input variables, environmental variables, and intermediate outcome variables changed only slightly from those reported previously (less than one one-hundredth of a point each).

Table 14

Standardized Regression Coefficients and Significance Values for Interaction Effects in Persistence Regression Analysis

	Ordinal—Completion		Ordinal—Units		Scalar—Units	
Independent Variable	β	*p*	β	*p*	β	*p*
Input Variables						
Gender	-.008	.442	**-.043**	.000	**-.060**	.000
Age	**-.077**	.000	**-.057**	.000	**-.118**	.000
Not a U.S. Citizen	-.010	.439	**.052**	.000	**.079**	.000
English is not Primary Language	**.041**	.001	.010	.385	**.033**	.005
Relative Family Resources	**.078**	.000	**.031**	.003	**.039**	.000
Entering Preparation Skills	**.060**	.000	**.040**	.000	**.046**	.000
Time Lived in the U.S.	.004	.811	.016	.249	**.033**	.018
Marital Status	-.007	.512	**-.031**	.003	**-.040**	.000
Parental Education	**.026**	.033	**.034**	.003	**.043**	.000
High School Diploma	**.067**	.000	**.074**	.000	**.051**	.000
Lowest Level Math Taken	**-.098**	.000	**-.156**	.000	**-.093**	.000
Lowest level English Taken	**-.073**	.000	**-.160**	.000	**-.096**	.000
Lowest level ESL Taken	**-.037**	.001	**-.099**	.000	**-.104**	.000
Interaction Variables						
Asian at a Black College	-.001	.919	.003	.764	.015	.090
Asian at a Hispanic College	.018	.144	.008	.516	-.016	.165
Asian at a Mixed College	.027	.075	.021	.158	.020	.163
Black at a Black College	**-.048**	.000	**-.037**	.001	**-.025**	.021
Black at a Hispanic College	**-.052**	.000	-.016	.144	**-.029**	.005
Black at a Mixed College	**-.078**	.000	**-.043**	.001	**-.031**	.010
Hispanic at a Black College	**-.041**	.000	**-.031**	.002	**-.023**	.018
Hispanic at a Hispanic College	**-.111**	.000	**-.038**	.040	**-.094**	.000
Hispanic at a Mixed College	**-.077**	.000	-.025	.164	**-.062**	.000
White at a Black College	.013	.174	.018	.054	.012	.190
White at a Hispanic College	.003	.809	.015	.125	.001	.942
White at a Mixed College	**.037**	.025	**.040**	.013	**.047**	.002

Table 14 (continued)

Independent Variable	Ordinal—Completion β	Ordinal—Completion *p*	Ordinal—Units β	Ordinal—Units *p*	Scalar—Units β	Scalar—Units *p*
Environmental Variables						
% units at primary college	-.007	.495	**.035**	.000	**.087**	.000
% of courses taken at night	**-.068**	.000	**-.127**	.000	**-.194**	.000
% online classes	**.041**	.000	.016	.088	-.003	.718
% terms on financial aid	**.126**	.000	**.134**	.000	**.158**	.000
Work Hours per week	**-.040**	.000	**-.068**	.000	**-.123**	.000
Intermediate Outcomes						
Satisfaction—Engagemnt Outside Class	**-.024**	.023	-.019	.058	-.007	.499
Satisfaction—Facilities Services	**-.051**	.000	-.011	.225	**-.029**	.002
Engagement with Student Services	**.069**	.000	**.062**	.000	**.067**	.000
Engagement in Class	**.025**	.033	**.032**	.005	**.026**	.016
Academic Engagement Outside Class	**.044**	.000	.007	.581	.003	.829
Social Engagement	**.085**	.000	**.040**	.000	**.054**	.000

Note. Ordinal-Completion—$F(36, 9{,}394) = 42.215$, $p = .001$; $R^2 = .136$; Ordinal-Units—$F(36, 9{,}394) = 70.824$, $p = .001$; $R^2 = .211$; Scalar—Units—$F(36, 9{,}394) = 90.839$, $p = .001$; $R^2 = .256$. Significant Betas are displayed in **bold** type.

Figure 7 presents the Beta values for the 12 interaction variables not reported previously.

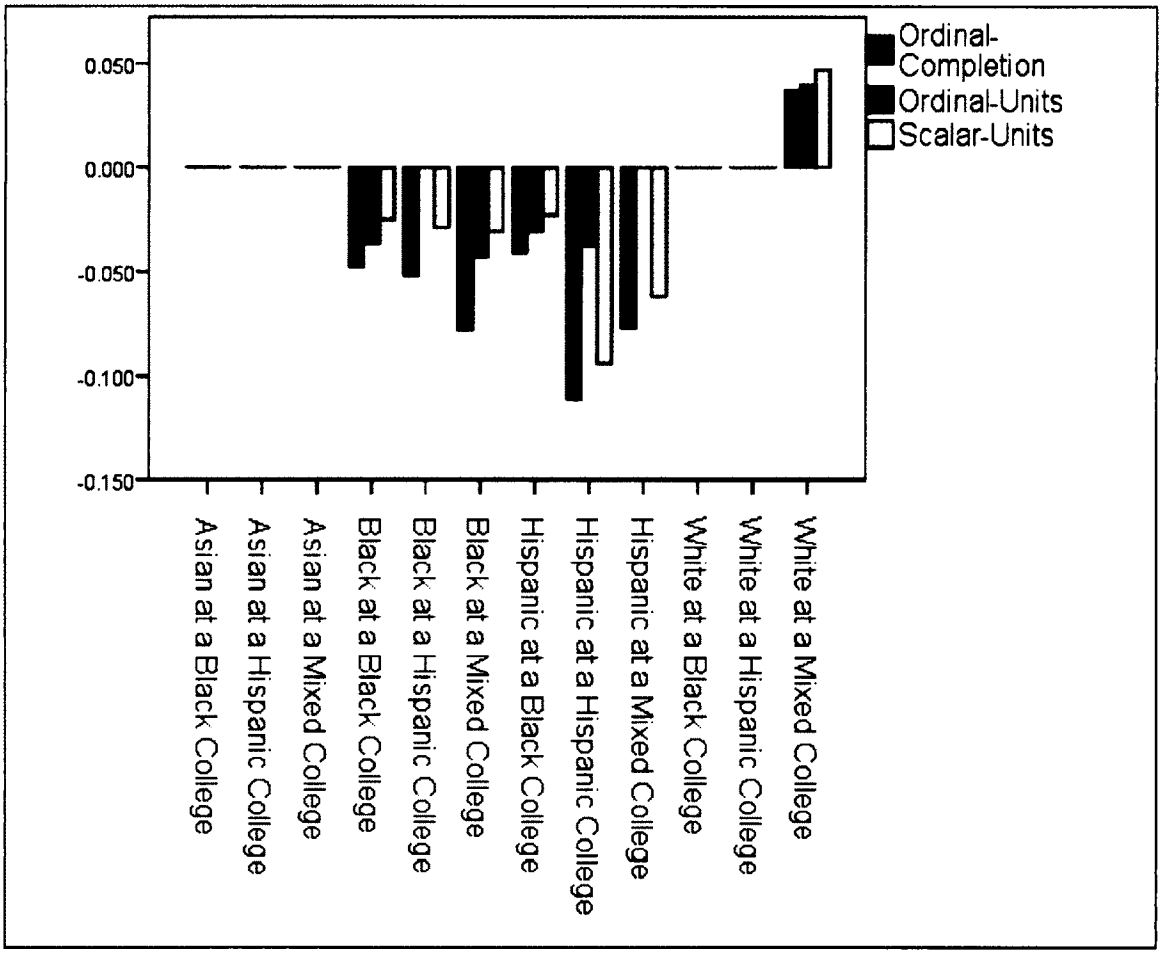

Figure 7. Betas for student race to college race interaction variables clustered by the three persistence outcome measures. Non-significant values ($p > .05$) are presented as zeros.

Chapter Summary

In this chapter, I described a methodological innovation to help drive the multiple regression analysis. To answer the research questions I conducted three sets of multiple regression analyses. Tabulations and graphical representations of the standardized regression coefficients, Beta, provide rich comparison of the predictive power of independent input and environmental variables on the outcomes variables.

The methodology developed for this analysis, using multiple output measures, allows for important independent variables to be identified through

their patterns of statistical significance across multiple output measures in each analysis. Graphical representations allow for efficient identification and comparison of the relative consistency and strength of predictive power on outcomes variables of the many independent variables entered into the multiple regression analyses.

Results were produced for each of the research questions: (a) comparing Betas for student racial and ethnic identity, other background characteristics, and environmental variables to Betas for college racial and ethnic demographic composition demonstrates the relative strength of student body composition to traditional variables in predicting student persistence; (b) interaction effects of student racial or ethnic identity with predominantly Black, predominantly Hispanic, or racially and ethnically mixed campuses displayed distinct patterns of effects on student persistence for each combination for Black and Hispanic students and limited effects for Asian and White students; and (c) comparing Betas for input characteristics and environmental variables to Betas for the college racial and ethnic demographic composition variables in predicting student engagement displays patterns of significance of these variables that differ from those observed in analyzing student persistence.

CHAPTER 5

DISCUSSION

Low student success rates in California community colleges reduce economic opportunity and prospects of a high quality of life for many who attend these colleges (California Community Colleges Chancellor's Office, 2012). These low completion and transfer rates continue to draw the attention of educators, civic leaders, and lawmakers who increasingly mandate structured programs and public reporting in exchange for additional funding or even as a condition for continued funding. The problem disproportionately affects Black and Hispanic students who are more likely to fail to complete programs of study at these colleges than Asian or White students.

This research study emphasized factors influencing student engagement and persistence in racially and ethnically diverse urban community colleges. The study examined the effects of social normative influences of college student peers on these student behaviors. Specifically the three research questions explored (a) the effects of student body racial and ethnic composition on student persistence, (b) the presence of contingent effects on the persistence of students from each of the four principal racial and ethnic groups based on the predominant student population, and (c) the effects of student body racial and ethnic composition on student engagement patterns. The methodology used in this quantitative study was based on college impact theoretical models

(Pascarella, 1985; Weidman, 1989). A series of linear multiple regression analyses were structured to examine the effects of student environmental factors on student engagement and persistence after controlling for key entering characteristics (Astin, 1991). Theoretical normative influences of student body demographics on these outcomes were operationalized in the multiple regression analyses by including college racial and ethnic composition as environmental analytical factors (Braxton & Caboni, 2005).

In the first three sections on the discussion of the findings, I answer the research questions. In the fourth section, I discuss findings from the methodological innovation that was required in order to make an existing large data set accessible to study persistence among a large sample of students. Long-term enrollment patterns were quantified to describe actual persistence behaviors. This approach to persistence and departure, as opposed to traditional methodological studies conducted over as short period, allowed the study to be more applicable to racially and ethnically diverse urban community colleges.

Interpretations and Implications

It is important to note that the highest variance explained (R^2) in the dependent variables used in the persistence multiple regression analyses in this study was 26% of the total variance, which is a moderate to large effect size according to Cohen (1988). This indicates that many other variables not included in this study affect persistence patterns of students in the colleges in this study. Nonetheless, by examining the size of the standardized regression coefficients, Betas, for independent variables, and the consistency with which

these independent variables were significant across different definitions of persistence, it is possible to learn which student characteristics or college experiences most pertain to student persistence. Figures 2, 3, and 4 in Chapter 4 respectively display the Betas for input, environment, and intermediate outcomes variables grouped by the three persistence models.

Student Body Composition and Persistence

College racial and ethnic composition. A central question to the study is whether there is an effect of the student body racial and ethnic composition on student persistence. The percentages of Asian, Black, and Hispanic students at the nine colleges in the study were used as independent variables to reflect the student body environment. Because the four student racial and ethnic groups represented at least 97% of the student population at any college, the percentage of the fourth population could be statistically predicted by the other three and is therefore not truly an independent variable. I chose to exclude the statistic for the percentage of White students as an independent variable—citing the White population in the region as the dominant population—to resolve collinearity problems in the regression equation.

Students of any racial or ethnic background were found to be less persistent the larger the percentage of Asian, Black, or Hispanic students. Table 9 in Chapter 4 shows that standardized regression coefficients, Beta, for the percentages of Asian, Black, and Hispanic students in the college environment were negative predictors of persistence under each of the three adopted persistence models. The negative Betas for student demographics were

comparable in scale (a) across the three persistence outcomes measures; (b) to other strong predictors of persistence, including the positive effect of the availability of financial aid; and (c) to the negative effect of initial placement in lower level English, English as a Second Language, or mathematics classes, and the negative effect of number of work hours.

Because the regression equation controlled for students' individual racial and ethnic identity, the effects of higher percentages of the populations of Asian, Black, or Hispanic students was found to significantly negatively affect student persistence irrespective of individual race or ethnicity. The inverse argument is that students are more likely to persist when each of these three predominant populations is smaller. This approach associates student persistence with racial and ethnic diversity in the college population. In the context of college populations in this study that are predominantly non-White, the term diversity here refers to the presence of multiple racial and ethnic groups. This definition is more purposeful than the imprecise reference to high proportions of minority students. A college with a predominant minority group is thus less diverse than one with multiple groups.

Past research on normative effects has not examined student populations that were composed of majority minorities (Akin, 2010; Caboni et al., 2005). These studies did not study differences between the small percentages of minority students, whom were all grouped as a single non-White group. The single non-White group did not exhibit in those studies consistent differences from White students. The differences in this study between the effects of

minority student populations as predominant college groups may explain past inconsistencies when racial and ethnic groups are presumed to have one non-White character.

McClenney and Marti (2006) found inconsistencies among minority students in their course taking and persistence behaviors when studying a large, statewide sample of minority students. Not controlling for racial and ethnic environmental factors had the effect of grouping all Black and Hispanic students into one statewide group. The findings of this study suggest that students experience college in the combined contexts of their experience, situated in their own race or ethnicity, and in the normative effect of their college racial and ethnic student environmental factors. If it is accepted that going to a predominantly White college has a particular, differential effect on minority students, then it is reasonable to extrapolate from the findings of this study that each student demographic environment has a specific effect on students from different racial or ethnic groups.

Racial and ethnic identity versus college composition. The data show that student body racial and ethnic composition is a stronger predictor of student persistence than individual student racial or ethnic background. Betas for student body racial and ethnic composition were more consistently significant and had values that were approximately twice the size of Betas for individual student race or ethnicity. Figure 5 in Chapter 4 illustrates this comparison. The latter observation may be remarkable if it can be duplicated, but it is important to acknowledge alternative interpretations. The colleges in this study are unusual in

that they offer a large sample of students within the same college system. The colleges present various combinations of student racial and ethnic populations including majority minority student body composition. The central question to any follow-up of this exploratory study is whether the students from the same group at the different colleges come from the same racial or ethnic population. Racial and ethnic groups at different colleges may not represent the same population as there may be differences between subgroups by national origin of an ethnic umbrella group concentrated in different neighborhoods or geographic region or by socio-economic status within a racial group.

Student race and ethnicity. Significant Betas indicate a negative predictor of persistence for being a Black student under all models and under the first and third regression models for Hispanic students. Being a White student appears to be a positive predictor of persistence, but that advantage disappears in the first model, which includes completion in the outcome measure. Being an Asian student only appears to predict persistence in the model that includes completion in the outcome measure. These data indicate not just a difference in the level of persistence between students from the different racial and ethnic groups but also a difference in how they persist. A broad interpretation is that Black and Hispanic Students exhibit a disadvantage in persistence, White students appear to persist only when excluding completion, and Asian students only exhibit an advantage over the other groups when completion is considered, the opposite of White students.

The results for Black and Hispanic students indicate the existence of factors or independent variables not included in this analysis that would explain the disadvantage they experience in education compared to White and Asian students. This disparity in educational attainment is well established in literature on education (Center for Community College Student Engagement, 2014; Pascarella & Terenzini, 2005), even when controlling for academic preparation and financial resources. The results for persistence of White and Asian students are more difficult to explain. Especially for Asian students, it is difficult to articulate how they, as a group, might at the same time exhibit better persistence in taking courses and completing programs of study, but not exhibit better persistence when completion is excluded from the persistence model.

As suggested in the discussion of college racial and ethnic composition, the results of the multiple regression analysis indicate that the four major racial and ethnic groups, as defined in this study, are not uniform. Racial and ethnic groups are more likely composed of groups within groups. The backgrounds, experience in college, and persistence or success are different among sub-groups of major racial and ethnic groups in significant but different ways than they are between major racial and ethnic groups.

The students in this study come from communities that are known to have diversity within their racial and ethnic blocks. Black students in some colleges are almost exclusively African Americans, often coming from historically underserved communities. In other communities and colleges, there are African American students from communities of mixed affluence and Black students from

immigrant communities from various parts of Africa and the Caribbean. These students have different educational and cultural traditions and experiences from the overarching Black population. White students similarly may not represent one population in some of these colleges. An Eastern European economic immigrant, a third generation local Middle-Eastern student, and a European American transplanted from a state with broadly differing traditions are all considered "White" in the data on which this study relied.

Implications for practice. The finding that student body racial and ethnic composition is a strong predictor of student persistence—stronger than individual student racial or ethnic background—promotes an argument for racial and ethnic diversity. In practice, since colleges tend to serve their local communities and do not select for the populations that attend, this finding has strong implications for promoting experiences in which students interact with more diverse peer groups and are exposed in the curriculum and academic practices to a variety of normative influences. In a college environment, especially in courses intended to guide student success, critical thinking exercises can guide students to actively recognize cultural influences from peer groups that empower or diminish persistence.

Implications for theory. The normative effects ascribed to community and college environment in Weidman's (1989) Model of Undergraduate Socialization are shown to be significant in influencing student persistence. This holds even if the findings obscure the presence of subgroups within umbrella racial and ethnic groups or whether racial and ethnic groups share different

socio-economic characteristics by college or geographic distribution. This finding justifies further exploration of the nature of the normative effects of student body population composition.

Understanding the mechanisms by which these norms are reinforced in community college environments will be helpful to educators in strengthening positive effects and countering negative influences on student persistence and success. Understanding these mechanisms in different college and community contexts will also advance the conversation about race and ethnicity in community colleges. This nuanced understanding of complex racial, ethnic, and socio-economic effects will clarify what characteristics and behaviors are generalizable and which stereotypes are distractions to developing sound educational policy and practice.

Implications for future research. Other studies of norms among community college students address concerns for grouping of non-White students into single populations to be contrasted with the predominant White population (Akin, 2010; Caboni et al., 2005). The current study produced results that expose a similar weakness in grouping students into just four groups when they are drawn from such dramatically diverse populations. Appropriate follow-up studies could explore how subgroups compare in how they interact with the academic and social elements of their colleges or how they are affected by the normative and racial and ethnic elements of the environment. Additional studies could examine persistence and completion rates using multiple definitions for the outcome variable.

Moreover, future studies can better refine data collected about student race and ethnicity. The initial data set used in this study subdivided background information on Hispanic students (four groups) and Asian students (nine groups) while only one category each of Black and White students was available. Future studies could proceed in two stages. First, existing data could be used to refine the understanding of persistence and completion behaviors among Asian and Hispanic students, for whom some subgroup data exist, to determine relevant factors that distinguish subgroups. Next, the study could be updated after obtaining more refined data on disparate groups within Black and White populations.

I recommended that future studies also refine how students are identified to include more than the four predominant racial and ethnic student subgroups as they might have unique characteristics and distinct persistence outcomes. The same logic applies to the analysis of the effects of racial and ethnic demographics. This would distinguish, for example, if the percentage of Filipinos in the student population has an effect on persistence similar or distinct from that of Chinese students.

In the absence of an independent variable for the percentage of White students in the population, no direct conclusion can be drawn from this data about the effect of the percentage of White students in a college population on overall student persistence. However, the analysis of interactions between student and population ethnicities in the next section may inform this question as it provides results for the effect on persistence of more or less diverse college

populations. Nonetheless, the relative strength of the effect of the percentage of student body racial and ethnic groups is notable. Future studies may explore statistical methodology that will allow an analysis to include all ethnicities of individual students and the proportions of the significant components of the student population as elements of the environment. Dual variables for racial and ethnic student populations would be racial/ethnic subgroup and an ordinal socio-economic measure.

Methodological limitations and opportunities arise from these recommendations. Even with a beginning sample of over 20,000 students, statistical constraints appeared in this study caused by low representation of some racial or ethnic groups at some colleges. A caveat in the selection of methodology for future research is that this limitation in the quantitative analytical approach will be magnified when dividing up the racial and ethnic groups.

This exploratory study examined whether there are normative effects of student body racial and ethnic demographics on student persistence. A contrasting question for future research is whether normative effects on persistence are experienced intrinsically and/or imposed externally. How to approach improving student engagement, persistence, and success depends on what can be learned about how each racial and ethnic student population perceives and exerts its collective influence on individual students. It will be important to learn if this influence is based on how students perceive themselves as members of one group or another, how the larger population perceives individuals or applies normative pressures to them, or whether there are

contingent normative influences between the various racial and ethnic groups. It is important to learn whether a self-described Latino who is perceived as White for socio-economic reasons or based on physical appearance, for example, experiences different normative pressures on persistence than a Latino student who fits a stereotype. As a foreign student coming to study at an elite university in the United States, I had to learn the concept and practicalities of the term White non-Hispanic. After 33 years, I still find some nuances of the culture of differences specific to this country to be perplexing.

To proceed with research that relies on perceived differences between–and within–racial and ethnic groups, it is important to acknowledge the complexity of defining race and ethnicity in twenty-first century America. Lineage or national origin is difficult to trace for many Whites whose ancestry is now mixed. Latin American cultures and traditions maintain clear distinctions among them, typically defined by national and historical origins. Latino, Hispanic, Chicano and other descriptors are not globally accepted (Calderon, 1992). Similarly, Asians include sub-groups that have been established in the Americas for many generations while others have immigrated in large numbers to certain parts of the United States from south and south east Asian countries in the past one or two generations. The history of Blacks is similarly mixed between more recent immigrants and the majority whose roots have been obscured. Among Blacks sharing the African American experience there remain social, economic and regional differences that must be attended to in future studies. It is relevant to note that one group not addressed in the study, Native Americans, deserves

attention that was not possible with the current statistical methodology because of this group's low proportional representation.

Studies of the normative effects of the environment on students must be refined with a sensibility to the experiences of the participants themselves if the results of these studies are to give urban community colleges better guidance in developing policy and practice. Recommendations for community colleges aimed at building normative practices that are directed toward continually learning about their student populations also underscore an important characteristic of American urban populations. These populations change in the service areas of some colleges faster than the turnover of personnel can bring in new people who are attuned to a college's history. As anecdotal observation, the student populations at colleges in this study have shifted visibly in the time since the survey data were collected. For practitioners then, knowing the students cannot be a finite, achievable task. Instead, it should be a college culture and career-spanning educational practice.

Research that is particular to community college peer groups. There is consistent evidence in educational literature of differential success rates by student race and ethnicity (Astin, 1993; Pascarella & Terenzini, 2005). The finding in this study that peer group racial and ethnic composition exhibits a stronger effect on persistence than individual racial and ethnic identity makes it important to redefine how peer groups are conceptualized and how student persistence and success are studied. It is important to develop educational practices that are responsive to both the background characteristics of students

and to the social/normative environments in which they are immersed at each college.

While research on peer groups has been conducted for several decades, this finding recommends a different class of research that is based on the community college environment in contrast with research that studies those community college students and behaviors that look most like their counterparts at the university. Interestingly, minority-serving universities that serve local, commuter populations may benefit from such new models.

My research study examined a range of student engagement and persistence behaviors that explored differences in student participation among multiple racial and ethnic groups. I studied these behaviors at multiple community colleges to identify any effect of student population racial and ethnic composition on engagement. In the area of race and ethnicity, two noteworthy, related characteristics distinguish my study from others that have examined norms at community colleges. Like Caboni et al.'s (2005) study of normative structures at four-year institutions, Akin's (2010) student sample, reflecting the college population, was predominantly White (92%). The population and sample compositions for the two largest minority groups were African American (5.8% of the population, 3.4% of the sample) and Hispanic (1.0% of the population, 2.2% of the sample). Furthermore student race and ethnicity were converted to a binary variable, White/not White. Because Akin's study population was predominantly White, it did not allow for a study of the effects of the student

population of significant minority student composition as may exist in the student populations in the urban colleges in this research study.

As Akin's (2010) findings grouped all non-White students into a single group they reflect a methodological presumption that all non-White students differ from White students in a similar way. This weakness leaves room for studies with larger proportions of non-White students. My research study did not duplicate the work of Caboni et al. (2005) and Akin (2010) in that it did not seek to identify the norms that exist at the colleges in the study. Rather, this study focused on identifying different engagement behaviors and persistence outcomes that may indicate the presence of norms influenced by college students' racial and ethnic compositions. The study broadens the attention to student body composition to examine diverse urban community colleges.

Interaction Effects of Student Race and Student Body Composition

The interaction effects between student racial or ethnic identity and the colleges' predominant racial and ethnic group were mostly negative, predicting lower persistence under each of the persistence models used in the study. Table 14 and Figure 7 in Chapter 4 summarize the standardized regression coefficients, Beta, for the interaction variables under the three persistence models. The size of these negative variables of persistence is quite important when compared to known strong predictors of student persistence.

For comparison, input variables that described the lowest level of mathematics, English, or English as a Second Language in which a student first enrolled had Betas on the three persistence variables that were approximately

twice the value of the Betas for interaction variables that were significant. The negative Beta's for these lowest level basic skills classes are measures of under-preparation—the lower the entering course, the less persistence is predicted. This confirms long-standing findings about community college students summarized by Cohen and Brawer (2008) and Pascarella and Terenzini (2005). The inverse is that these variables predict higher persistence the higher the level of the core classes in which students can enroll upon arrival at college. As academic preparation for college is a strong predictor of persistence, this suggests the importance of the negative prediction of persistence that the interaction effects displayed between student race and college racial and ethnic composition.

The interaction effects variables were also compared to the availability of financial aid, defined by the variable for percentage of terms attending college when students received financial aid. The Betas for financial aid, a very strong predictor of persistence at urban community colleges where large majorities of students have some financial need, were two to three times the size of Betas for the significant interaction effects variables. The negative Betas for the interaction variables were also found to be comparable in size to the positive prediction of persistence of the engagement variables: in-class academic engagement, social engagement, or engagement with student services.

Student body racial and ethnic composition predicts persistence under the three persistence models contingent upon the race or ethnicity of the student. There was no significant interaction effect for Asian students at predominantly

Black, predominantly Hispanic, or mixed colleges. This finding underscores that there is no significant association between the proportion of Asian students attending a college with engagement outcomes measures. The low level of engagement influenced by Asian students suggests a cultural characteristic that bridges between the subgroups of Asians that were hypothesized earlier as a result of inconsistencies in persistence results among Asians.

A cautious argument can be made that student body diversity has a positive effect on persistence. White students experienced a positive effect on persistence at colleges with no predominant population. They experienced no significant interaction effect on persistence at colleges with predominantly Black or predominantly Hispanic student bodies. This is a significant finding about the success of White students in diverse colleges. Further questions persist. No colleges in the study had predominantly White student populations. Also, the regression methodology required the elimination of the variable for the percentage of White students in the first persistence analysis to avoid collinearity errors. As noted earlier, as student populations are refined into groups within racial and ethnic groups, a follow-up study could benefit from studying how sub-groups among White students interact with colleges with predominant groups of other students.

Hispanic students experienced the greatest negative effect on persistence among all groups. The interaction effect of Hispanic students attending colleges with predominantly Hispanic student populations reaffirmed Bahr's (2008) finding

that first-year Hispanic students benefitted less at institutions with higher proportions of Hispanic students.

Black students experienced less negative effects than Hispanics did at institutions with predominant populations of either Black or Hispanic students. Contradicting the hypothesized positive effect of diversity on student success, however, the interaction effect of Black students attending a "mixed" college had a greater negative Beta and predicted lower persistence than when Black students attended either a college with a predominantly Black or a predominantly Hispanic student body. It can be argued from this observation that Black students are more persistent (or at least less negatively affected) in environments with higher proportions of minority students or less polarized populations.

Implications for practice. Students are affected differently by the racial and ethnic mix of students, depending on their own race or ethnicity. The effect size in terms of variance explained in the multiple regression equation indicates that this is an important outcome, as do the comparisons of Betas for interaction effects in the persistence equation compared to Betas of important variables such as academic preparation and financial resources.

Practitioners must extend their understanding of peer group effects. This exploratory study does not explain how students are influenced by their peer environment. It has shown that students' experiences are created by the interplay between unique characteristics of the college student culture and the unique characteristics of the individual students. Practitioners must learn the

culture and the experiences that students engage in when they attend the college, including both the elements of the students' environment that help to retain them and those that either lead to isolation or actively repel them.

Practitioners operate at the individual and the system levels. At the individual level, faculty and staff who interact with students in class, counseling sessions, at service counters, or walking around campus must learn from their students the contexts within which these students experience the college environment. An anonymous student leader speaking at a formal educational seminar I attended once declared, "I have a Ph.D. in being me." He was speaking about the community pressures he confronted on and off campus and to the standardized teaching environment with which he was engaged that did not have in it mechanisms to learn about the student's own experiences.

This study has shown that students can experience the same college in different ways. Different students can encounter different colleges on the same campus. In addition to encouraging one-on-one discussions and expository classroom exercises with students to learn about normative environments, practitioners can use useful devices such as fishbowl or focus group research exercises. In these exercises, a facilitator engages students in discussing topics of importance to student interaction while observers learn about supports and challenges in the college cultures and environments as the students experience them. Observers also absorb the rich nuance of the interactions between students that points them to the closely held worldviews that students hold regarding the college, the community, and the peer group.

At the college or system levels, leaders must resist overly prescriptive treatments that they believe apply to all students or even to all students of one group. Rather, they should encourage local ethnographic research as common practice. Community college employees, by the nature of their qualifications and experiences, differ from the students. The challenge to community college leaders serving diverse student populations is to help infuse practices at the college that become themselves normative in order to continually learn about the students' environments and experiences.

To coin a metaphor, in a data-driven world that emphasizes knowing how well a college is doing by disaggregating course and program completion data by race, ethnicity, gender, disability, and other factors, it becomes important to understand the disease before proceeding from symptoms to cure (Astin, 1991).

Student Body Composition and Engagement

The data in Table 10 in Chapter 4 indicate that social engagement is not as well predicted by the same variables as are engagement with student services, engagement in class, and academic engagement outside class. The variance explained in the multiple regression equation using social engagement as the dependent variable is considerably lower. The largest predictors of the four engagement variables as described in this study in approximate order of predictive power were: perceived academic standards, satisfaction with college personnel, percentage of terms receiving financial aid, and proportion of terms attended when nine or more units were attempted.

Engagement appears to be predicted by characteristics of traditional full-time students. The four largest predictors of engagement were environmental variables. In the analysis of predictors of engagement, background characteristics, including student racial and ethnic identity, family financial resources, and parents' education are still significant, but contribute less to predicting engagement. The predictors of engagement describe an academically engaged full-time student who appreciates academic rigor and perceives faculty and staff as supportive. Because the majority of students at community college receive some form of financial aid, the variable that indicates a higher proportion of terms on financial aid predicts more distinctly—and predictably—a higher engagement with student services. Figure 6 in Chapter 4 also demonstrates that Betas for these environmental variables were two to four times as large as the variables representing the student racial and ethnic demographics.

Even though the Betas were small, there were differences between the influences of student body racial and ethnic composition variables on student engagement. The percentage of Asian students at a student's primary college appears to not predict the engagement of students in a significant manner. The percentage of Black and Hispanic students at the college predicts small, positive engagement in academics, in and out of class, and in social engagement. It is noteworthy that once other background characteristics are controlled for, being Asian or Hispanic is a small negative predictor of academic engagement, in class or out of class. Especially for Hispanics, the contradictory negative effect of

Hispanic identity and the positive effect on engagement of attending a college with larger proportion of Hispanic students are remarkable.

Implications for policy. The mission of California community colleges is being narrowed and focused on transfer, career education and job preparation, and basic skills development for collegiate studies. The legislature that is funding and directing this shift is also dedicating resources to student success initiatives and to access and equity for students from all backgrounds (California Community Colleges Chancellor's Office, 2012, 2013a, 2013c). The findings of this study indicate that there are three distinct policies can be developed that will enhance student engagement. The first is focusing on improving academic interactions between faculty and students in and outside class. This can be supported with special programs that can encourage faculty professional development on methods to engage students and to encourage and to financially support part-time faculty to actively engage with students. Second, a policy that improves access to financial aid should have an influence on student engagement by allowing them to work less and attempt more classes every semester. Finally, increasing the number of students who attend college full-time or close to full-time should affect engagement as well as other outcome and success measures (California Community Colleges Chancellor's Office, 2013c).

Perceived academic standards. The academic standards scale was defined to include the following student-reported academic activities: reading outside textbooks, writing reports and taking essay exams, applying skills and concepts learned in class, evaluating information, analyzing arguments, and

integrating ideas and information from multiple sources. Engagement and persistence differed in how they were predicted by student perceptions of academic standards. This finding may be explained in part by McClenney and Marti's (2006) findings that academic engagement is associated with improved academic performance while engagement in student services supported student retention. In the analysis of persistence, it was found that the scale of perceived academic standards had no significant effect on persistence once other characteristics were controlled. As a consequence, the scale of academic standards was removed from the persistence equation. Conversely, in the engagement analysis, the scale for academic standards was the largest predictor of each of the four scales of engagement with student services, engagement in academics (in and out of class), and social engagement. Therefore, perceived academic standards do not bridge between engagement and persistence. Notably, in the persistence analysis, the small positive Betas for engagement variables were outmatched by the negative Betas of the variables for Black, Hispanic, or Asian student populations.

One way to interpret this is that collective characteristics of students who behave like traditional, engaged students are associated with those students' perceptions of, and perhaps recognition of, high academic standards. In the persistence equation, engagement variables may stand in for perceived academic standards given the high predictive value of academic standards on engagement. It may be valuable to pay greater attention to increasing students' engagement with academic standards both by strengthening academic outreach

to students and by encouraging through formal and informal faculty training the complex pedagogical practices that are defined by the academic standards scale.

Social engagement and engagement with student services were found to have a small positive effect on all measures of student persistence. Consequently, efforts to support academic, social, and student services engagement should continue. As a result of the findings reviewed in this section, policies aimed at enhancing student engagement should remain a focus at all colleges. Colleges with large or predominant racial or ethnic student populations, as are found in urban settings, show no evidence of benefiting differentially from any policies on engagement.

Implications for practice. Practitioners and educational leaders may choose to read these results differently from policy makers. Researchers and policy makers may be influenced by the data on student engagement that suggest little or no relationship between student engagement, student race or ethnicity, or with the racial and ethnic composition of the college. Educational practitioners may choose to acknowledge that engagement practices reflect institutional well being and a full expression of the diversity of the student population giving voice to unique cultural characteristics. Recall that the independent variables that best predict student engagement are perceived academic standards, satisfaction with college personnel, percentage of terms receiving financial aid, and proportion of terms attended when nine or more units were attempted. These are environmental variables that most resemble the

experience of full-time students. These variables can be utilized as indicators of the culture and climate of the institution. Educational leaders can gather local data and use these variables as vital statistics of the institution, comparing its own progress from year to year. Institutional data on the different effects that students from each racial and ethnic group experience and the data on how student body racial and ethnic composition may influence engagement also become baseline measures for practitioners to gage their colleges' progress on better engaging students. Where a researcher may say affirmation in the data of the reputation of community college students as being minimally engaged, the college leader sees opportunity to improve on baseline measures knowing what variables and aspects of the college environment best stimulate that engagement.

Cultural integrity. Tierney (1999) introduced cultural integrity as a model to expand Tinto's (1987) concepts of academic and social integration toward improving the persistence of minority students attending predominantly White colleges. The cultural integrity model rejects the requirement that minority students must discard their culture in favor of the institutional paradigm if they are to integrate and persist in college. Tierney also questioned the deficiency approach used in describing minority students as lacking in cultural capital, without which they will ostensibly remain at a disadvantage (Bourdieu, 1986). Tierney offered that the institutions must also adopt practices that respect students' cultural traditions:

> Rather than view the academic world as a place into which students need to fit and assimilate or face intellectual suicide, this explanation views the academy as ripe for reinterpretation and restructuring. Not only must students fit into the academic culture, but educational organizations must also accommodate for and honor students' cultural difference. (Tierney, 1999, p. 83)

One of the acknowledged weaknesses in this study was the absence of data about how faculty and staff perceived the experiences of students and how they interacted with them. Nonetheless, it is reasonable to expect that there are differences between students and college employees in their cultural capital given that college employees—especially faculty—belong to a group that has been highly successful in college. Racially and ethnically based cultural differences will likely exist because faculty rarely represent the same racial and ethnic composition as the communities they serve, especially when those communities comprise academically underprepared populations. Even when faculty come from the local community, urban communities can and do shift in population racial ethnic composition at rates much higher than the transitions in faculty's typical career-long service. As a consequence, it is always a fair assumption that faculty and students have differences in both cultural capital and cultural traditions. Viewed in the light of cultural difference between students and college employees, limited engagement between these two groups may well be seen as product of that difference.

If Tierney's (1999) cultural integrity model is to be applied in the community college, then college employees must become attuned to their students just as they expect students to learn the traditions of academic culture. Students learn the traditions of academic culture through formal supports and sanctions—the typical instruments in any community for enforcing norms. In return, the institution must take upon itself the practice of enforcing a norm of cultural competency among its members. Typically this is done by offering professional development across the institution and by introducing into collegial dialogues the language of cultural inclusion as a duty and an instrument of student success.

Culture change for faculty requires united purposeful leadership. Faculty and administrative leaders must unite around a purpose of elevating the level of academic culture and creating a new norm of learning about student cultures and experiences. The locus for defining the new norm is college-wide convocations, standing committees and new, special committees populated with leaders, interested new-comers (who are often skeptical but will have the academic integrity to explore new ideas) and new faculty who must be trained in from the beginning.

Implications for theory. McClenney (2007) confirmed in a national study that student engagement is a valid proxy for student persistence and academic achievement. The strongest influence identified in this study on persistence and success came from active and cooperative learning and from engagement with faculty. High-risk students who were highly engaged were found to persist in

community college. This study does not confirm that reported strong connection between persistence and engagement.

Because the colleges in this study are not representative of national samples, special theoretical consideration may be necessary that accounts for part-time students who are not socially engaged but who still persist in their studies.

Implications for future research. Understanding engagement requires further understanding of the peer groups and the complex interactions within, between, and outside them. This study, as an exploratory study, points to the possibility of groups within racial and ethnic groups, as illustrated in the section on persistence, and to measures of engagement that are obfuscated by a very high dependence on financial aid and work and other societal demands external to the college experience. To better understand the racial and ethnic groups at a college and to determine a realistic structure of peer groups, qualitative, exploratory work is needed. Because the questions arising from the results about engagement differ considerably from established models, it is necessary to develop a deep understanding of the experiences of students. A phenomenological study might best allow for the development of a typology of experiences that can then be used in a survey to define geographic, racial and ethnic, and socioeconomic group boundaries and the nature of the interactions within and between these groups. This approach can lead to improved future understanding of engagement, persistence, and ultimately student success in environments as complex as community colleges. In this manner, it may be

possible to clarify why being Hispanic is a negative predictor of engaging academically in class and outside class, but attending a predominantly Hispanic college is a positive predictor of these behaviors. These results are more likely complex than inconsistent.

Measuring Persistence

In operationalizing persistence, I took a long-term view of actual enrollment behaviors of community college students. I chose not to replicate the traditional focus on those students who behave most like full-time, residential, college-ready university students who have tended to be less diverse than community college students. College impact theories and research models were developed from studies about those students and practitioners tend to view community college students through those research and practice lenses (Pascarella & Terenzini, 2005). Additionally, the practical challenges to tracking persistence over a long period have led to a focus in research on first year persistence or even the stopping out phenomenon of leaving college temporarily, which Horn (1998) showed reduces the likelihood of both persisting and completing a degree. An important reason for this traditional focus on early dropping out or stopping out is that risk factors evince themselves early in the student's experience (Cohen & Brawer, 2008). This study has taken into account that community college students who depart for reasons that are typically out of the control of both the colleges and the students may return. "In studies that asked students whether they intended to return, a majority of the respondents

indicated that they would be back one day. . . . Why not leave when other demands interfere? You can always return" (Cohen & Brawer, 2008, p. 68).

There are three relevant considerations in the development and use of the multiple measures of persistence used in this research study. Methodologically, the absence of a predefined, consistent measure of persistence is a shortcoming in the study that can only be resolved by collecting a priori measures. Secondly and conversely, there is an opportunity to influence educational praxis by fitting multiple measures of persistence to large, existing data sets. In the interpretations below, it will become clear that some measures of persistence are affected differently by some input or environmental independent variables. Thirdly, the multiple persistence measures used in this study show noteworthy patterns of behavior by different groups of students that suggest refinements in future definitions of persistence and research that uses such measures.

Three of the original eight persistence measure designs were used in the final analyses. As reported in the results chapter, each of these three persistence measures, when used as dependent variables in the linear multiple regression analyses, led to the highest variance explained, adjusted R^2, within the class or grouping of persistence measures as detailed in Table 7 in Chapter 4. For clarity, in the following discussion I will use the name of each of the three classes from which each of the final three persistence measure was taken. These names describe what distinguished one class from the other classes, but all classes include measures that favor consistent term-to-term attendance and some measure of heavy course-taking when attending college. The following

summarizes the characteristics of each of the three persistence measures used in the final linear regression analyses:

Ordinal—completion. Based on ordinal measures of term-to-term consistency in attendance; higher unit course-taking; and completion of certificates, degrees, or transfers.

Ordinal—units. Based on ordinal measures or consistency in attendance only. It emphasizes more heavily term-to-term consistency in attendance and higher unit course-taking.

Scalar—units. Used an arithmetic algorithm. Like the second class, the third class emphasizes persistent term-to-term attendance and higher unit counts while attending.

Interpretation. The value of the multiple models of persistence used in this study of diverse students and populations emerges in the patterns of the effects of independent variables on the various persistence measures. The persistence measure of scalar-units explained the largest variance among persistence measures in all the multiple regression equations. Table 9 in Chapter 4 illustrates consistency in the significance, scale, and sense of the standardized regression coefficients, Beta, of some independent variables. Other variables were not significant under any persistence model and were excluded from the analysis. No significant Betas under the three persistence models had opposite senses, positive or negative signs, for the same variable. The three representative models agreed about the effect of independent

variables when significant, but the three models of persistence were influenced more by some independent variables and for some populations than for others.

Examining the Betas for the independent variables in the groupings of input, environmental, and intermediate outcomes does not reflect any statistical or methodological association between the independent variables. The independent variables were all entered into the linear multiple regression analysis in a single block. I will discuss the findings about the predictive power of selected input variables on student persistence to establish continuity between this linear multiple regression analysis and other analyses based on college impact theoretical models.

Student preparation. The largest and most consistent Betas that predict the three persistence outcomes measures are those associated with student preparation. Three independent variables recording the lowest level course taken in mathematics, English, or English as a second language (ESL) were found to have the highest Betas. All were negative indicating that students were less likely to persist in college the lower the level of course they started with in these three disciplines. In a similar effect, the composite measure of self-reported entering preparation skills obtained from the student survey showed that students were more likely to persist the higher their perception of their preparation on a number of academic and study skills measures.

Prior education. For all three persistence measures it appears that completing a high school diploma before entering college is a significant predictor

of persistence compared to entering college without one. As preparation for college, completing high school appears to be effective.

Age. In all three persistence models, Beta for student age is a negative predictor of persistence. Being older predicts less likelihood of persistence. Students with non-traditional goals such as lifelong learners and skills upgrade could not be distinguished in this study from those seeking certificates, degrees, and transfer preparation.

Educational goals. In the analysis phase, I demonstrated that student-reported educational goals do not significantly predict persistence. An initially stated degree-seeking or transfer goal is unreliable over time. Knowing students' current goals will help to refine which students to include in researching persistence and success.

Finance. Two variables describe student finances: (a) Family income averaged by number of family members, as reported in the student survey as an input variable, and (b) the percentage of terms attended when a student was receiving financial aid. Both variables predicted persistence positively in all three models. Student financial resources are significant in persistence. While fees are comparatively low in California this fact restricts the flow of federal financial aid to colleges while the high cost of living must be borne by the students who must then balance part-time or full-time work with attending college (Cohen & Brawer, 2008).

Uncertainty about goals and outcomes. A number of input characteristics variables did not contribute to predicting the persistence measure

Ordinal-Completion that accounted for degree and certificate completion and transfer to university. These independent variables were: not a U.S. citizen, gender (female), parents education level mean, married status, and time lived in the United States.

Such differences in the significance of input variables reflect acknowledged weaknesses in the data about goals and outcomes. For the same reason, the Omnibus Outcomes Measure Approach created an envelope of solutions that reduced uncertainty about the appropriateness of the outcomes measures themselves and the relevance of the independent variables that predict these outcomes.

Implications for theory. The findings of this study on the methodology of defining persistence will influence educational theory from two directions. First, there is a clear need for multiple measures of persistence in community college research that reflect the complexity of student backgrounds, goals and interests, abilities, and the influences in their multiple environments. The differences between university students and the diverse populations attending community colleges demand that college impact theories be adapted based on research on real community college populations. Deductive community college studies that attempt to study community college students with theory developed for university students will either be ineffective in describing the variables that explain student behaviors or will preselect participants who most resemble university students. Studies of first-year, full-time students enrolled in transfer level courses, for example, are the least likely to net research results that scale up to the total,

racially and ethnically diverse, part-time, intermittent community college student population.

Secondly, the findings suggest a refinement in outcomes measures in educational theory and research. The foundational theoretical perspective for this study is Weidman's (1989) Conceptual Model of Undergraduate Socialization which I used as the basis for studying the effects of differential institutional and student environments on students. Weidman's conceptual model uses socialization outcomes as the outputs of the socializing environment. The outcomes of the methodology developed for this study suggests a parallel theory in which persistence in community college is an appropriate outcome to consider in a conceptual model that ties socialization to persistence in community college where persistence is a greater concern for students as a measure of success than the intermediate outcomes of socialization.

This approach can also be described as a blending in of Tinto's (1975, 1987, 1988, 1993) research and theory on student departure, the inverse of which is student persistence. The advancement in the theory on socialization effects in Tinto's theoretical work on persistence and departure derives from the multiple measures of what qualifies in community colleges as relevant measures of persistence and departure. This study demonstrated that students with different backgrounds and in different college settings evince persistence differently.

Recommendations

The following discussion examines implications of this research to college practice viewed holistically from the researcher's perspective as a practicing community college president at a minority serving community college.

The College Situated in Internal and External Environments

First, I put the recommendations based on the findings of this research study in the context of regulatory student success process mandates. Next, I recommend a transformative leadership approach that takes into account the need to respond bureaucratically to external system mandates and to create internally an environment that promotes a student-centered culture of engagement that implements learnings gained from this study.

Regulatory environment. In this section I describe the prevailing regulatory requirements and funding opportunities to which college leaders must respond. Leadership recommendations on improving student persistence and success are based on the findings of the effect of student body racial and ethnic demographics in the context of California state legislative and regulatory mandates.

Student equity plans. California community colleges have had a mandate to maintain equity plans since 1991. As part of the goals set in education code (California Education Code 66010.2) for California's elementary, secondary, and postsecondary systems, "educational opportunity and success" are to be provided to the broadest range of students including:

> (c) Educational equity not only through a diverse and representative student body and faculty but also through educational environments in which each person, regardless of race, gender, gender identity, gender expression, sexual orientation, age, disability, or economic circumstances, has a reasonable chance to fully develop his or her potential. (California Education Code, 66010.1-66010.8)

The attention to student body diversity and educational environments that promote success ties in to the research questions of this study. Student equity can be defined operationally as follows: "Disproportionate impact is a condition where some students' access to key resources and supports and ultimately their academic success may be hampered by inequitable practices, policies and approaches to student support" (California Community College Chancellor's Office, 2013c, p.14). Equity is thus the leveling of this disproportionate impact on all students through removal of barriers to resources, supports and success.

In over two decades since this equity plan mandate was set, the Board of Governors of California Community Colleges regulations have set increasingly specific student success measures to be included in equity plans that have been tied to colleges' ability to receive state funding. These plans have also mandated attention to specific student groups who might be impacted disproportionately by colleges' programs and services: American Indians or Alaskan natives, Asians or Pacific Islanders, Blacks, Hispanics, Whites, men, women, and persons with disabilities. Further studies and legislative action in California have led to legislation that emphasizes equity as a component in student success programs

(Liu, 2011, SB1163; Lowenthal–Seymour-Campbell Student Success Act of 2012, SB 1456; California Community Colleges Chancellor's Office, 2012).

Recommendations of the student success taskforce. The latest equity plan is based in the recommendations of the California Community College Student Success Taskforce (California Community Colleges Chancellor's Office, 2012; California Community College Chancellor's Office, 2013c). Funding for the equity plan is specifically directed to colleges that the systemwide chancellor's office deems to have higher proportions of students with greater needs (Leno, 2014, SB851).

The Student Success Taskforce recommendations view equity from a system perspective:

> The Task Force's commitment to educational equity is reflected ... most explicitly in its proposal to establish statewide and college-level performance goals that are disaggregated by racial/ethnic group. Doing so will allow the system and state leaders to monitor impacts of the policy changes on these subgroups while also focusing state and local efforts on closing gaps in educational attainment. (California Community Colleges Chancellor's Office, 2012, p. 9)

In this report, specific recommendations on equity fall under the recommendation: Enable Efficient Statewide Leadership & Increase Coordination Among Colleges (p. 57). System-wide and college level student progress goals are to be developed and data gathered and reported publicly to identify equity gaps.

Student Success and Support Program (SSSP). Recent legislation is increasingly directive in regulating services to students. The Student Success Act of 2012 reorganized required matriculation services into a Student Success and Support Program (SSSP). SSSP mandates direct admitted students to participate in and colleges to provide college orientation, assessment and course placement, educational planning, and evaluation of student progress in order to maintain access to classes through priority enrollment privileges. This legislation also requires colleges to adopt a common student assessment program and to participate in the community college system's accountability scorecard. Students receiving fee remission are required under this legislation to have an identified educational goal and to maintain satisfactory progress toward that goal.

The structure of SSSP service mandates and associated requirements for student progress reporting are being implemented in the same timeline as this study is being concluded. The availability of funding motivates colleges to comply with the mandates to conduct equity research, create compliant plans, and report in a timely manner.

Transformative Leadership and Social Justice Orientation

State mandates and funding will drive local action. To the extent that colleges can be formally successful in responding to these mandates, they are responding to structured directives designed at the system level. The proper leadership response in this case is bureaucratic management. Bureaucracy in the face of increasing calls for accountability, efficiency, and measurable production of degrees, certificates, and transfers to university requires the

creation of formal strategic plans and structured measurable objectives (Nevarez, Wood, & Penrose, 2013). These objectives are typically achieved through a hierarchical organizational structure and formalized regulations that effectively fit a community college's actions into a larger state bureaucratic system.

To receive funding for special programs and respond to the demands of political leaders, college system requirements, public perception, and even the local faculty and student perceptions, community college leaders—typically the president and vice presidents—must be competent, effective, and accountable bureaucrats. Competent bureaucracy and compliance, in their responsiveness to external impetus, may fail to be sufficiently responsive to local conditions in such complex academic systems as community colleges are with their multiple mission requirements and diverse student bodies.

Nevarez et al. (2013) outlined numerous leadership strategies that an educational leader may negotiate in reacting to external impetus while serving local needs. In path-goal leadership, leaders achieve institutional goals by motivating behaviors that cover the range of directive, supportive, participative, or achievement oriented. But this is ultimately little more than a human resources approach to implementing bureaucratic goals (Bolman & Deal, 2008). These management and leadership strategies, and others, are necessary for the college to survive and even to thrive economically, politically, and with their reputations intact.

The findings of this study led to recommendations to promote college traditions that pursue a deeper understanding of the complexity and diversity of

often changing student backgrounds and experiences. Through purposeful engagement with students, college personnel can learn to infuse success-oriented thinking and behavior into student culture. To succeed, colleges require leadership that will transcend compulsory, bureaucratic responses. Nevarez et al. (2013) framed a leadership approach that fits colleges resembling those in this study:

> Transformative leadership is a social justice-oriented approach undergirded by notions of democracy (e.g., opportunity, equity, fairness, freedom). Leaders using this framework seek to identify, challenge, and redress issues of marginalization, power, privilege, and subjugation in society. In particular, transformative leaders are concerned with inequities facing diverse student communities, recognizing that these inequities are part of a larger societal context that reinforces hierarchical structures of dominance and power. For these leaders, racism, sexism, ableism, classism, and other forms of marginality are viewed as evils that *must* be deconstructed and countered. Given this perspective, transformative leaders are concerned with outcomes. They desire to construct new sociocultural realities that are liberating and emancipatory in nature. (p. 143)

Freire (1971), in a summary of his 1970 seminal work on emancipatory education, *Pedagogy of the Oppressed* (Freire, 1990), posed the challenge that urban community colleges face today serving poor, underprepared students, in stark terms that fit a world then still emerging from colonial rule: "Education

cannot be neutral. . . . We tend to ignore or to obscure the rôle of education which, in that it is a social 'praxis' will always be in the service either of the 'domestication' of men or of their liberation" (p. 1). While this is an uncomfortable concept for many college personnel accustomed to maintaining a formal distance from students, it personalizes the aptness of transformative leadership as an all-encompassing, mission-level response to the inequities in education systems.

The complex differences in how students react to colleges' social normative environments that were described in this study present clear challenges. One challenge is to refine the study to begin to understand how these social norms emerge and influence students, and another challenge is to act. This study focused principally on persistence behaviors but the recommendations can be summarized with a challenge for urban community colleges to transform themselves.

Community college leaders can choose between different approaches of engaging their colleges in the discussion of pedagogy. They can choose to challenge their colleges with a critical theorist's radical departure from traditional pedagogies and a critique of the exaggerated attention to the educator's authority (Giroux, 2010; McLaren, 2000). Leaders can alternatively challenge faculty to adopt a more traditional student-centered experiential learning approach of "involving colleges" (Ethington, 2000, Kuh, Schuh, & Whitt, 1991) that emphasizes learning and personal development outside the classroom or even to engage in the pragmatist educational philosophy of John Dewey's (1916)

discourse on education and democracy. Regardless of the choice of pedagogy, transformative leadership for students and for institutional culture begins with engaging the college in in-depth examination of how college affects students (Pascarella & Terenzini, 2005).

Discussing philosophical underpinnings of pedagogy is difficult to initiate and to maintain because of the competing day-to-day demands on community college faculty and staff. Effective leaders will identify the proper local settings for these dialogues. The role of faculty in California community college governance (Academic Senate, 2014) makes it practical for administrative and academic leaders to partner closely to build transformational discussions of pedagogy and equity into formal academic committee structures.

Summary of the Dissertation

In this research study I have shown the importance of studying the success of urban community college students in the context of complex peer groups at their colleges. Student engagement and persistence were shown to be influenced substantively by the student racial and ethnic demographics at the colleges they attend.

In the absence of structured persistence data, I developed an analytical method that used multiple algorithms that I implemented in parallel throughout the study. These multiple definitions of persistence induced patterns of data that circumscribed variables that were found to be consistently significant. I made three specific findings. First I found that peer group diversity matters in student persistence. Students were more likely to persist when they attended colleges

with lower percentages of any single racial or ethnic group. Larger proportions of Asian, Black, or Hispanic student populations were associated with lower persistence.

Practitioners responding to this first finding can support students to persist by creating learning and engagement experiences that expose students to interactions with more diverse micro-environments. It will require faculty leaders to adopt new practices that will redefine engagement to include diverse peer groups. They must transition from teacher-centered to learner-centered pedagogies. Administrative and policy leaders learning from this finding can support shifts in teaching and learning traditions by sponsoring professional development opportunities to support increased engagement with and understanding of students

Secondly, the effects of student body racial and ethnic demographics are intertwined with students' own racial or ethnic identity. Unique interaction effects emerged in the study findings for students attending the predominantly Black or predominantly Hispanic colleges found among the institutions in the study, or colleges whose demographics did not have a predominant population. Asian, Black, Hispanic, or White students persisted differently depending on their colleges' predominant populations.

While the first finding promoted the importance of diversity in the student population, the second finding highlighted the complexity of the experiences of students at urban colleges when interacting with racial and ethnic groups similar or different to theirs. This complexity does not suggest a typology of student

interactions with other racial groups; it suggests the need for deeper research on how students interact with other groups in these settings and why they are influenced as they are.

Third, a multiple regression analysis examining the effects of student demographics on engagement found only small effects, in contrast to the strong links of demographics on persistence. Measures of academic and social engagement at these diverse urban colleges appeared more associated with full-time college attendance practices such as attending full-time, having access to financial aid, and appreciating high academic standards.

In response to these findings I recommended promulgating cultural competencies as institutional norms for all members of the college. At the most basic level, I recommended using professional development practices and enhanced, engaging pedagogies to help college personnel learn strategies to distinguish between the peer group cultural attributes and students' individual characteristics.

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APPENDIX A

SURVEY INSTRUMENT

The Los Angeles Community Colleges "Student Survey" is administered in a scantron format. What follows is the exact text of the instructions and questions from the survey instrument. Response options, when needed, are presented inside brackets.

Student Survey
Los Angeles Community Colleges
Your Experiences and Opinions are important!

Please help your college to do a better job by telling us about your background and your experiences with the education that you are receiving. **Your responses are strictly confidential**. Results will be used only for institutional statistics and research.

Please read these instructions carefully. If you have questions, ask your instructors for help.

Write in your STUDENT IDENTIFICATION NUMBER, BIRTH DATE CLASS SECTION NUMBER, and COLLEGE and NUMBER, your instructor has a list of ID's for this class.

If you have completed this survey in another class, mark YES in item V and give the survey to your instructor.

I. STUDENT ID NUMBER: _ _ _ _ _ _ _ _ _

II. BIRTH DATE: _ _ _ _ _ _ _ _

III. SECTION NUMBER: _ _ _ _

IV. COLLEGE:

- o City
- o East LA
- o Harbor
- o Mission
- o Pierce
- o Southwest
- o Trade-Tech
- o Valley
- o West LA

V. If you completed this survey in another class, bubble YES and STOP

A. STUDENT BACKGROUND

1. Hower important were the following sources of information in your decision to enroll at this college? (Mark one response for each item)

   [1 – Not Important; 2 – Somewhat Important; 3 – Important; 4 – Very Important]

   a. Published class schedule
   b. On-line class schedule
   c. Newspaper, radio, or television advertisement
   d. High school advisor or cournselor
   e. College representative coming to my high school
   f. College or Distric website
   g. Family or friends
   h. Current or former students
   i. Special events for high school students and/or the community at this college
   j. Workplace notice, program, or employer's recommendation
   k. Athletic coach recruitment

2. How important to you were each of the reasons listed below in your decision to enroll at this college? (Mark one response for each item)

   [1 – Not Important; 2 – Somewhat Important; 3 – Important; 4 – Very Important]

   a. Minimal admission requirements
   b. Low cost
   c. Specific educational program(s)
   d. Reputation for good teaching
   e. Close to home
   f. Close to work
   g. Type of students
   h. Athletics or other student activity
   i. Have friends here

3. How do you think of yourself?

   o Primarily as a student who is employed
   o Primarily as an employee who is going to college
   o Primarily as a parent who is going to college
   o Primarily as a student

4. What is the highest degree or certificate that you ever intend to obtain? (Mark one only)

   - o High school diploma or GED
   - o Certificate in a vocational program
   - o Associate Degree
   - o Bachelor's Degree
   - o Master's Degree
   - o Professional Degree (M.D., Law, etc.)
   - o Academic Doctorate (Ph.D., Ed.D.)
   - o Not seeking degree/certificate or already have
   - o Undecided

5. Have any of the following been a problem for you in reaching your academic goals? (Mark one response for each item)

   [1 – Not a Problem; 2 – Minor Problem; 3 – Moderate Problem; 4 – Major Problem]

   a. College rules and regulations
   b. Cannot get classes I need
   c. Quality of high school preparation
   d. Study skills
   e. Reading and writing skills
   f. Language difficulties
   g. Motivation to study
   h. Financial factors
   i. Job obligations
   j. Family obligations
   k. Uncertainty about my personal or career goals
   l. Too much is expected by instructors
   m. Other personal problems

6. Choose the ONE response that most nearly describes the length of time you and your family have lived in the United States. (Mark one only)

   - o I have lived in the US less than 5 years
   - o I have lived in the US between 5 and 10 years
   - o I was not born in the country but I have lived here more than 10 years
   - o I was born in this coutnry but both of my parents were not
   - o At least one of my parents was born here, but one or more of my grandparents were not
   - o All of my grandparetns were born in this country

7. What is the highest level of education that each of your parents achieved? (Mark one item for each parent)

   [Columns provided for Father and Mother]

   a. Elementary school or less (grades 1-6)
   b. Middle school (grades 7-8)
   c. Some high school/secondary school but did not graduate
   d. Completed high school/secondary school
   e. Some college but no degree
   f. Two-year college degree
   g. Four-year college degree
   h. Advanced degree (graduate or professional)

8. What is your marital status?

   o Single, never married
   o Married or domestic partner
   o Separated, divorced or widowed

9. Do you have dependent children? (Mark all that apply)

   a. No
   b. Yes, 5 years old or younger
   c. Yes, 6-18 years old
   d. Yes, over 18 years old

10. If you have a disability, please indicate your disability. (Mark all that apply)

    a. No disability
    b. Mobility impaired
    c. Visually impaired (not correctable with glasses or contacts)
    d. Hearing imparied
    e. Speech/language impaired
    f. Attention deficit disorder
    g. Acquired brain injury
    h. Learning disability
    i. Psychological disability
    j. Other disability

11. If you have a disability, have you informed the college Disabled Students Office? (Mark one only)

    - o Yes
    - o No
    - o No disability

B. FINANCIAL RESOURCES

12. Did your parent(s) claim you as an income tax dependent in the most recent year? (Mark one only)

    - o Yes
    - o No
    - o I don't know

13. What is your total family annual income, not including loans, grants or scholarships? (If you answered yes in question 12, your total earnings are what you and your parents made together.) (Mark only one amount)

    - o $0 - $13,000
    - o $13,001 - $18,000
    - o $18,001 - $23,000
    - o $23,001 - $28,000
    - o $28,001 - $33,000
    - o $33,001 - $38,000
    - o $38,001 - $43,000
    - o $43,001 - $48,000
    - o $48,001 - $58,000
    - o $58,001 or more

14. How many people are in the household (including yourself) reported in question 13? (Mark one number only)

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

15. How many hours per week do you normally work? (Mark one only)

    - o 40 hours or more
    - o 20 – 39 hours
    - o 10 – 19 hours
    - o Less than 10 hours
    - o I don't work

16. Are you receiving money from any public assistance program (For example, TANF/Cal WORKS, SSI/SSDI, General Assistance, or Section 8)?

    - o Yes
    - o No

C. COLLEGE SERVICES

Please rate EACH of the college services listed below in terms of the frequency with which you use the service, its availability, and your satisfaction with the service. [Applies to Questions 17 - 32]

- How Often You've Used the Service [0 – Never; 1 – Once Ever; 2 – Once a Semester; 3 – Multiple times per Semester]
- Availability of Service [0 – Not Applicable; 1 – Not Available when Needed; 2 – Usually Available; 3 – Available when Needed]
- Your Satisfaction with the Service [0 – Not Applicable; 1 – Not Satisfied; 2 – Somewhat Satisfied; 3 – Very Satisfied]

17. Business Office

18. Registration

19. Admissions/Records

20. Assessment Office

21. Group Orientation

22. On-line Orientation

23. Financial Aid Office

24. Tutoring Services

25. Transfer Center

26. Career Center

27. Counseling

28. Bookstore

29. Food Services

30. Health Center

31. Library

32. Computer Labs

D. COLLEGE EXPERIENCES

33. At this college, how often do you do each of the following? (Mark one response for each item)

    [0 – Never; 1 – Seldom; 2 – Sometimes; 3 – Often]

    a. Ask questions or participate in class discussions
    b. Give a presentation or performance in class
    c. Go to class unprepared
    d. Skip class
    e. Work with other students in groups during class
    f. Work with others outside of class to prepare class assignments
    g. Discuss ideas from your classes with others outside of class (students, family members, co-workers, etc.)
    h. Have serious conversations with students who differ from you in terms of their religious beliefs, policical opinions, or ethnic background

34. How much do your courses involve the following activities? (Mark one response for each item)

[1 – Very Little; 2 – Some; 3 – Quite a Bit; 4 – Very Much]

a. Memorizing from reading and lectures and repeating back in class or on tests
b. Analyzing an argument or idea
c. Integrating ideas and information from multiple sources
d. Evaluating the quality and usefulness of information, arguments, or methods
e. Applying theories or concepts learned to practical problems or situations
f. Applying a new skill learned in your class work
g. Reading materials other than the textbooks
h. Writing papers or reports of more than 3 pages
i. Write essay exams in class

35. During this school year, have you done any of the following? (Mark Yes or No for each item)

a. Participated in a community-based or service project as a part of a class
b. Tutored or taught other students (paid or voluntary)
c. Attended a college sporting event, theater production or musical performance
d. Attended a college club meeting
e. Worked with instructors or other college staff on activities outside of class

36. How often do you use a computer for each of the following activities? (Mark one response for each item)

[0 – Never; 1 – Seldom; 2 – Sometimes; 3 – Often]

a. Use a computer AT HOME to do school work
b. Use a computer AT WORK to do school work
c. Use a computer ON CAMPUS to do school work
d. Use the Internet to get information for an assignment
e. Use email, instant messaging or other electronic method to work on an assignment with other students
f. Use email, instant messaging, or other electonic method to communicate with an instructor
g. Use the College website
h. Use the Library website
i. Use the Internet to apply, register, check grades, add or drop classes

37. How would you describe your interactions with instructors? (Mark one response for each item)

[0 – Never; 1 – Seldom; 2 – Sometimes; 3 – Often]

a. I talk about educational or career plans with an instructor
b. I discuss ideas from my readings or classes with instructors outside of class
c. In general, I receive prompt feedback (written or oral) from instructors on my performance
d. I visit instructors during their office hours

38. During the last regular week of school, how many hours did you spend in each of the following activities? (Mark one response for each item)

[0 – None; 1 – 1-5; 2 – 6-10; 3 – 11-20; 4 – 21-30; 5 – 30 Plus]

a. Class preparation (studying, reading, writing, rehearsing, doing homework)
b. Participation in college-sponsored activities (clubs, campus publications, student government, intercollegiate or intramural sports, etc.)
c. Family responsibilities
d. Commuting (to school and/or work)
e. Socializing, watching TV, other recreation

39. Outside of class/lab time, how many hours a week do you spend on campus? (Include studying, work, library, cultural and/or leisure activities.) (Mark one answer only)

- o None
- o Three hours or less
- o Three to six hours
- o Six to nine hours
- o Nine to twelve hours
- o Twelve or more hours

40. How much have your experiences at this college both in and out of class helped/improved your ability to do the following? (Mark one response for each item)

[1 – Very Little; 2 – Some; 3 – Quite a Bit; 4 – Very Much]

a. Acquire a broad general education
b. Acquire job or work-related knowledge and skills
c. Write clearly and effectively
d. Speak clearly and effectively
e. Think critically and analytically
f. Solve numerical problems
g. Use computers and other information technology
h. Work effectively with others
i. Learn effectively on your own
j. Understand yourself
k. Understand people of other racial, cultural or ethnic backgrounds
l. Develop a personal code of values and ethics
m. Contribute to the welfare of your community
n. Develop clearer career goals
o. Get a job or advance your career
p. Set educational goals and monitor your progress

41. To what extent do you agree with the following statements about faculty and staff at this college? (Mark one response for each item)

[1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree]

a. Faculty are supportive of my education
b. I greatly admire and respect one or more instructors or staff
c. Administrators and staff are supportive of my education
d. Students are treated fairly at this college, regardless of gender, ethnicity, or sexual preference
e. Instructors give me honest feedback about my abilities and skills
f. Instructors are willing to spend time outside of class to discuss issues with me
g. Instructors encourage me to explore different veiwpoints
h. Instructors treat me with respect
i. Instructors are up-to-date in their field

42. To what extent do you agree with the following statements? (Mark one response for each item)

[1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree]

a. I would like more "hands on" expereince in the classroom, when appropriate
b. I would like more relevant experience outside the classroom as part of courses, when appropriate
c. I would like to take more courses about other cultures and ethnic groups
d. I would like more opportunities to work with other students in small groups
e. I would like more contact with instructors outside of classes
f. I would encourage otehrs to attend this college

43. To what extent to you agree with the following statements about educational practices at this college? (Mark one response for each item)

    [1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree]

    a. Textbooks and reading materials are usefull for the courses
    b. Grading practices in the courses are fair
    c. Tests cover the course material presented
    d. The policieis and penalties for cheating are provided and are followed
    e. Enough sections of General Education courses are offered so that I am able to take the coruses I need in the semester of my choice
    f. All the advanced courses required for my program are offered frequently enough to let me complete my program without delay
    g. College publications clearly and adequately reflect the college's policies and procedures (catalog, schedule of classes, website)
    h. I receive a course syllabus that describes the course expecations, grading procedures and learning outcomes the course should provide
    i. Course syllabi are followed

E. CAMPUS FACILITIES AND SERVICES

(Mark one response for each item)

[0 – Does Not Apply; 1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree]

44. I feel safe and secure on this campus

45. Campus buildings are clean and well maintained

46. Food service on this campus is sufficient

47. The restrooms on the campus are clean and well maintained

48. The grounds and public areas on this campus are clean and well maintained

49. The campus has adequate outside lighting after dark

50. Sufficient parking is available on campus

51. The parking lots are safe, well lighted, and well maintained

52. Please describe the one or two things you like best about this college. [Open ended response]

53. Please describe the one or two things about this college that you would most like to see changed. [Open ended response]

APPENDIX B

INDEPENDENT VARIABLES

Independent Variables in Multiple Regression Analysis

The variables listed in Table B1 were initially included in the multiple regression analysis. For theoretical reasons presented in Chapter 3, the variables are grouped into input characteristics, environmental variables that reflect the influences to which students are exposed while attending college, and intermediate outcomes that describe experiences students have had as a result of choices they made in how to engage with the colleges they attend after being introduced to those environments.

Table B1

Initial Regression Variables Grouped by Input, Environmental, and Intermediate Outcomes

Characteristic/ Environmental Setting	Variable
Input Characteristics	Gender, Age, Race/Ethnicity (Asian, Black, Hispanic, White), U.S. Citizenship, Primary language not English, Primary Educational Goal, Relative family finances, Entering preparation, Time spent in the U.S., Marital status, Having children, Having a disability, Parents' education level, Having a previous degree, Having a high school diploma, Lowest level of mathematics taken in college, Lowest level of English taken in college, Lowest level of English as a second language taken in college
Environmental Variables	Proportions of Asian, Black, Hispanic, and White Students at the primary colleges; Attending a large college, Percent of courses taken at primary college, Percent of courses taken at night, Percent of courses taken online, Percent of terms attended while receiving financial aid, Hours of work per week, Perceived academic standards (defined in Appendix C)
Intermediate Outcomes	Satisfaction Scales (defined in Appendix C): Satisfaction with college personnel, Satisfaction with engagement outside class, Satisfaction with facilities and services; Engagement Scales (defined in Appendix D): Student services engagement, Instructional engagement – In class, Academic engagement outside class, Social engagement

A number of variables that describe aspects of student attendance were used to compute the persistence dependent variable. When initially used to quantify engagement they produced artificially high values of variance explained, R^2. Table E1 in Appendix E lists these key variables.

Student Input Characteristics Variable Coding

Student input characteristics are derived from data in the LACCD student information system and the *LACCD Spring 2007 Student Survey*.

Student records data. Data for the following variables were obtained from the student records in the student information systems database:

- Gender: Female = 0, Male = 1 (Females are the majority at eight of the nine colleges)
- Age – Institutional researchers provided date of birth and computed age at the time of the survey in spring 2007.
- Race and Ethnicity: Dummy code race and ethnicity by the four major groupings: Asian, Black, Hispanic, and White.
- U.S. Citizenship.
- Primary Language Not English: I created a dummy variable that codes all non-English primary language speakers.
- Educational Status: Prior educational attainment at time of first enrollment.
- Educational Goal: Convert to dummy variables from 16 available goals into three groupings: Degree, certificate, or transfer goals;

Career training or advancement only; and High School or Basic Skills.

- Financial Aid Status: Convert to three dummy variables: No financial aid, Board of Governors (BOG) fee waiver only, and BOG waiver plus Pell Grant. A second dummy code was aggregated to indicate the use of any financial aid.

Student survey data. The following entering characteristics were derived from the spring 2007 Student Survey:

- Entering Preparation: An inverted composite score of survey questions about problems reaching academic goals due to high school preparation, study skills, reading and writing skills, and language skills (Questions 5 c, d, e, f)
- Longevity in US: Defines an ordinal variable of how long the student, their parents, or their grandparents have been in the US. (Question 6)
- Mean Parents Education: The scalar mean of the ordinal parents' highest education level. (Question 7)
- Family Obligations: Composite scale from questions about marital status and presence of dependent children in various age categories. (Convert Question 8 into dichotomous; convert question 9 into dichotomous; add 8, 9 to get ordinal with values: 0, 1, 2.)
- Disability: Convert questions about a variety of disabilities into a dichotomous variable. (Question 10)

- Financial Resources: Divide household income (ordinal variable in Question 13) by number of people in household (question 14) to produce an ordinal scale that describes the student's relative financial circumstances.

APPENDIX C

STUDENT SATISFACTION VARIABLE CODING

Student satisfaction variables are treated as intermediate outcomes variables in this study. Three student satisfaction scales were computed from the LACCD Spring 2007 Student Survey as indicated below: Satisfaction with College Personnel, Satisfaction with Engagement Outside Class, and Satisfaction with Facilities and Services.

An additional scale, Academic Standards, was computed to define student perceptions of academic rigor and is described here.

Satisfaction with College Personnel

Create a scale by summing the satisfaction scores reported by students on a four-point Likert scale with responses to the following question ranging from Strongly Agree (4) to Strongly Disagree (1):

"To what extent do you agree with the following statements about faculty and staff at this college?"

- "Faculty are supportive of my education" (Question 41a)
- "I greatly admire and respect one or more instructors or staff" (Question 41b)
- "Administrators and staff are supportive of my education" (Question 41c)
- "Students are treated fairly at this college, regardless of gender, ethnicity, or sexual preference" (Question 41d)

- "Instructors give me honest feedback about my abilities and skills" (Question 41e)
- "Instructors are willing to spend time outside of class to discuss issues with me" Question 41f)
- "Instructors encourage me to explore different viewpoints" (Question 41g)
- "Instructors treat me with respect" (Question 41h)
- "Instructors are up-to-date in their field" (Question 41i)
- "Instructors encourage me to take responsibility for my education" (Question 41j)

Satisfaction with Engagement Outside Class

Create a scale by summing the satisfaction scores reported by students on a four-point Likert scale with responses ranging from Strongly Agree (4) to Strongly Disagree (1).

"To what extent do you agree with the following statements?"

- "I would like more relevant experience outside the classroom as part of courses, when appropriate" (Question 42b)
- "I would like to take more courses about other cultures and ethnic groups" (Question 42c). This question is included as a reflection of student satisfaction with contact with a diverse population.
- "I would like more opportunities to work with other students in small groups" (Question 42d)

- "I would like more contact with instructors outside of classes" (Question 42e)

Satisfaction with Facilities and Services

Create a scale by summing the satisfaction scores reported by students on a five-point Likert scale with responses ranging from Strongly Agree (5) to Strongly Disagree (1).

- "I feel safe and secure on this campus" (Question 44)
- "Campus buildings are clean and well maintained" (Question 45)
- "Food service on this campus is sufficient" (Question 46)
- "The restrooms on this campus are clean and well maintained" (Question 47)
- "The grounds and public areas on this campus are clean and well maintained" (Question 48)
- "The campus has adequate outside lighting after dark" (Question 49) "Sufficient parking is available on campus" (Question 50)
- "The parking lots are safe, well lighted, and well maintained" (Question 51)

Academic Standards Scale

Create a scale by summing the scores reported by students on a four-point Likert scale with responses ranging from Very Much (4) to Very Little (1). "How much do your courses involve the following activities?"

- "Analyzing an argument or idea." (Question 34b)

- "Integrating ideas and information from multiple sources." (Question 34c)
- "Evaluating the quality and usefulness of information, arguments or methods." (Question 34d)
- "Applying theories or concepts learned." (Question 34e)
- "Applying a new skill learned in your class work." (Question 34f)
- "Reading materials other than textbooks." (Question 34g)
- "Writing papers or reports of more than 3 pages." (Question 34h)
- "Write essay exams in class." (Question 34i)

APPENDIX D

STUDENT ENGAGEMENT VARIABLE CODING

Student engagement variables are treated as intermediate outcomes variables in this study. Four student engagement scales are computed from the LACCD Spring 2007 Student Survey as indicated below: Student Services Engagement, Instructional Engagement–In Class, Academic Engagement Outside Class, and Social Engagement.

Student Services Engagement

Create a scale by summing self-reported scores on each of the following services. Each is rated on a scale of 0-3 ranging in frequency of use from Never (0) to Multiple Times per Semester (3):

"Please rate EACH of the college services listed below in terms of the frequency with which you use the service"

- "Assessment Office" (Question 20)
- "Group Orientation" (Question 21)
- "On-line Orientation" (Question 22)
- "Financial Aid Office" (Question 23)
- "Tutoring Services" (Question 24)
- "Transfer Center" (Question 25)
- "Career Center" (Question 26)
- "Counseling" (Question 27)
- "Bookstore" (Question 28)
- "Food Services" (Question 29)

- "Health Center" (Question 30)
- "Library" (Question 31)
- "Computer Labs" (Question 32)

Instructional Engagement

Create two scales for academic engagement, in-class engagement and engagement outside the classroom, by summing self-reported scores on each of the following experiences. Each is rated on a scale of 0-3 ranging in frequency of use from Never (0) to Often (3):

In-class engagement. At this college, how often do you do each of the following."

- "Ask questions or participate in class discussions" (Question 33a)
- "Give a presentation or performance in class" (Question 33b)
- "Go to class unprepared" (inverted scale) (Question 33c)
- "Skip class" (inverted scale) (Question 33d)
- "Work with other students in groups during class" (Question 33e)

Academic engagement outside class: "At this college, how often do you do each of the following."

- "Work with others outside of class to prepare class assignments" (Question 33f)
- "Discuss ideas from your classes with others outside of class (students, family members, coworkers, etc.)" (Question 33g)

- "Have serious conversations with students who differ from you in terms of their religious beliefs, political opinions, or ethnic background" (Question 33h)

"How would you describe your interactions with instructors?"

- "I talk about educational or career plans with an instructor" (Question 37a)
- "I discuss ideas from my readings or classes with instructors outside of class" (Question 37b)
- "In general I receive prompt feedback (written or oral) from instructors on my performance" (Question 37c) ((This question stands out. It will be interesting to see if it hangs with the other questions in Cronbach's alpha test.))
- "I visit instructors during their office hours" (Question 37d)

Social Engagement

Create a scale by summing self-reported scores on each of the following activities. In the survey each question is rated yes or no and will receive scores of 1 or 0 respectively.

"During this school year, have you done any of the following?"

- "Participated in a community-based or service project as a part of a class" (Question 35a)
- "Tutored or taught other students (paid or voluntary)" (Question 35b)

- "Attended a college sporting event, theater production or musical performance" (Question 35c)
- "Attended a college club meeting" (Question 35d)
- "Worked with instructors or other college staff on activities outside of class" (Question 35e)

APPENDIX E

PERSISTENCE VARIABLE DEFINITIONS

SPSS syntax for computing eight persistence measures is detailed here. The outcomes measures are divided into ordinal and scalar variables. The ordinal variables account for patterns of attending college term-to-term and course-taking patterns. The first ordinal class also accounts for documented measures of certificate completion, associate degree attainment, and/or transfer to four-year institutions. The appendix concludes with Table E1, which summarizes the variables used to create the ordinal and scalar persistence measures.

Persistence Measures

Class 1: Ordinal Persistence Measures Accounting for Attendance and Completion

Ordinal Measure 1. Ordinal persistence measure that rates completion and transfer highly. This measure also gives higher rating to any completion without breaks in attendance semester-to-semester. Consistent attendance with higher unit-taking is rated higher in this formulation, but lower than documented completion/transfer.

* 7: Completion (Transfer or completion of associate degree or certificate regardless of how many semesters - WITH NO BREAK).

* 6: Completion - intermittent (associate degree or transfer regardless of semester count - at least one break.)

* 5: Complete Certificate of Completion or Skills certificate with a break.

```
* 4: High unit, uninterrupted course taking: 3+ terms, 9+ units attempted 75% or
more of terms enrolled, spanfactr =1.5 or less (2/3 of semesters or more
frequently).
* NB1 .667 is median of exposure9.
* 3: Course-taking persistence at an average of 6+ units attempted 75% or more
of terms enrolled for three or more semesters - attendance intermittent/half of
semesters or more frequently.
* NB1  0.875 is median of exposure 6, the proportion of terms taking 6+ units.
(Educated choice that is less than 100% half-time or more)
* NB2 84% of students have span factor 1.5 or less. i.e. attended 2/3 or more of
the terms during their span of attendance.
*       (Educated choice that allows for breaks in attendance.).
* 2: Intermittent Course-taking or low units: below 6 units .25 or more of terms, or
attended less than half of span of terms of attendance.).
*     This is a catchall, default category not defined in the logical statements.
*     It will include intermittent prof. devt./life long learners, low unit takers who
attend multiple semesters
*       but don't complete/transfer in LACCD.
* 1: Stopped – course-taking ceased after a total of three semesters or less
without completion or transfer.
* Set default to catchall category 2.
COMPUTE persistordnl1= 2.
VARIABLE LABELS persistordnl1 "Persistence: Ordinal Outcomes Measure".
```

```
VALUE LABELS persistordnl1 1 "Stopped - 3 or less terms" 2 "Intermittent and/or
Low Units"
3 "Half-time Intermittent but Persistent" 4 "High-unit Uninterrupted" 5 "Certificate -
Intermittent and no transfer"
6 "Completer but Intermittent" 7 "Completer Uninterrupted".
* Level of persistordnl rises as additional criteria are fulfilled.  e.g., a completer in
two terms is initialized at 2 then set to 1 in first IF
* then to 5 if completed a cert, then to 6 if also completed an AA or transferred,
then to 7 if completed any cert/degree or transferred without break.
IF (numterms le 3) persistordnl1 =1.
* persistordnl = 2 is catchall.  Low unit-taking and/or high spanfctr.
IF (numterms ge 3) and (exposure6 ge .75) and (spanfctr le 2) persistordnl1 = 3.
IF (numterms ge 3) and (exposure9 ge .75) and (spanfctr le 1.5) persistordnl1 =4.
IF (range(degrlevel,1,2) = 1) persistordnl1 = 5.
* Cert of achievement or Skills cert at spanfctr > 1.
IF (degrlevel =3) or (range(transfer,1,4) = 1) persistordnl1 = 6.
* Complete AA or transfer at spanfctr >1.
IF (range(degrlevel,1,3) = 1 or (range(transfer,1,4) = 1)) and (spanfctr =1)
persistordnl1 = 7.
EXECUTE.
```

Ordinal Measure 2. Similar to Ordinal Measure1, this measure gives high rating to completion and transfer and to attendance with high units more consistently semester-to-semester. This measure accounts for possible

unrecorded completion of skills certificates or focused individual education goals for which there is no formal recognition. This is achieved by assigning a higher persistence score to consistent attendance for two to three semesters with half-time or higher units attempted but where there is no documented formal outcome. This behavior would otherwise be ranked at the lowest persistence score as "Stopped" attending.

```
COMPUTE persistordnl2= 2.
VARIABLE LABELS persistordnl2 "Persistence: Ordinal Outcomes Measure -
Unrecoreded skills certs".
VALUE LABELS persistordnl2 1 "Stopped - 3 or less terms" 2 "Intermittent and/or
Low Units" 3 "High unit enrollment 2-3 terms continuous"
4 "Half-time Intermittent but Persistent" 5 "High-unit Uninterrupted" 6 "Certificate -
Intermittent and no transfer"
7 "Completer but Intermittent" 8 "Completer Uninterrupted".
* Level of persistordnl rises as additional criteria are fulfilled. e.g.,a completer in
two terms is initialized at 2 then set to 1 in first IF
* then to 6 if completed a cert, then to 7 if also completed an AA or transferred,
then to 8 if completed any cert/degree or transferred without break.
IF (numterms le 3) persistordnl2 =1.
* persistordnl = 2 is catchall. Low unit-taking and/or high spanfctr.
IF (range (numterms,2,3) = 1) and spanfctr = 1 and exposure6 = 1 persistordnl2
= 3.
IF (numterms ge 3) and (exposure6 ge .75) and (spanfctr le 2) persistordnl2 = 4.
```

IF (numterms ge 3) and (exposure9 ge .75) and (spanfctr le 1.5) persistordnl2 =5.

IF (range(degrlevel,1,2) = 1) persistordnl2 = 6.

* Cert of achievement or Skills cert at spanfctr > 1.

IF (degrlevel =3) or (range(transfer,1,4) = 1) persistordnl2 = 7.

* Complete AA or transfer at spanfctr >1.

IF (range(degrlevel,1,3) = 1 or (range(transfer,1,4) = 1)) and (spanfctr =1) persistordnl2 = 8.

* Any Cert, degree or transfer with spanfctr = 1.

EXECUTE.

Ordinal Measure 3. This measure accounts for attendance and consistency behaviors similarly to Ordinal Measure 1 and Ordinal Measure 2 above. It gives even higher ranking to possible unrecorded completion of skills certificates or individual goals as described by attending two to three semesters while taking half-time or more units with no breaks in attendance.

COMPUTE persistordnl3= 2.

VARIABLE LABELS persistordnl3 "Persistence: Ordinal Outcomes High-ranked Unrecoreded skills certs".

VALUE LABELS persistordnl3 1 "Stopped – 3 or less terms" 2 "Intermittent and/or Low Units" 4 "High unit enrollment 2-3 terms continuous"

3 "Half-time Intermittent but Persistent" 5 "High-unit Uninterrupted" 6 "Certificate – Intermittent and no transfer"

7 "Completer but Intermittent" 8 "Completer Uninterrupted".

* Level of persistordnl rises as additional criteria are fulfilled; e.g., a completer in two terms is initialized at 2 then set to 1 in first IF

* then to 6 if completed a cert, then to 7 if also completed an AA or transferred, then to 8 if completed any cert/degree or transferred without break.

IF (numterms le 3) persistordnl3 =1.

* persistordnl = 2 is catchall. Low unit-taking and/or high spanfctr.

IF (range (numterms,2,3) = 1) and spanfctr = 1 and exposure6 = 1 persistordnl3 = 4.

IF (numterms ge 3) and (exposure6 ge .75) and (spanfctr le 2) persistordnl3 = 3.

IF (numterms ge 3) and (exposure9 ge .75) and (spanfctr le 1.5) persistordnl3 =5.

IF (range(degrlevel,1,2) = 1) persistordnl3 = 6.

* Cert of achievement or Skills cert at spanfctr > 1.

IF (degrlevel =3) or (range(transfer,1,4) = 1) persistordnl3 = 7.

* Complete AA or transfer at spanfctr >1.

IF (range(degrlevel,1,3) = 1 or (range(transfer,1,4) = 1)) and (spanfctr =1) persistordnl3 = 8.

* Any Cert, degree or transfer with spanfctr = 1.

EXECUTE.

Class 2: Ordinal Persistence Measures Accounting for Attendance Patterns Only

Ordinal Measure 4. This ordinal persistence measure ranks only attendance behaviors, not certificate/degree completions or transfer. This measure gives higher rank for persistent course taking of relatively high units

over a two-to-three semester span of terms than some less consistent, intense course-taking patterns.

```
COMPUTE persistordnl4 = 2.
VARIABLE LABELS persistordnl4 "Persistence: Ordinal Attendance behaviors".
VALUE LABELS persistordnl4 1 "Stopped – 3 or less terms" 2 "Intermittent
and/or Low Units" 4 "High unit enrollment 2-3 terms continuous"
3 "Half-time Intermittent but Persistent" 5 "High-unit Uninterrupted".
IF (numterms le 3) persistordnl4 =1.
* persistordnl = 2 is catchall. Low unit-taking and/or high spanfctr.
IF (range (numterms,2,3) = 1) and spanfctr = 1 and exposure6 = 1 persistordnl4
= 4.
IF (numterms ge 3) and (exposure6 ge .75) and (spanfctr le 2) persistordnl4 = 3.
IF (numterms ge 3) and (exposure9 ge .75) and (spanfctr le 1.5) persistordnl4 =5.
EXECUTE.
```

Ordinal Measure 5. This is an ordinal persistence measure that ranks lowest the persistence of students who take three or less terms. These students are rated lower than in Ordinal Measure 4 for relatively intense, short-term course-taking. Half-time or higher unit-taking and continuous enrollment over two to three semesters is still ranked higher than intermittent and/or low average unit-taking.

```
COMPUTE persistordnl5= 2.
VARIABLE LABELS persistordnl5 "Persistence: Ordinal Attendance low ranked
low semester count".
```

VALUE LABELS persistordnl5 1 "Stopped – 3 or less terms" 2 "Intermittent and/or Low Units" 3 "High unit enrollment 2-3 terms continuous"
4 "Half-time Intermittent but Persistent" 5 "High-unit Uninterrupted".
IF (numterms le 3) persistordnl5 =1.
* persistordnl = 2 is catchall. Low unit-taking and/or high spanfctr.
IF (range (numterms,2,3) = 1) and spanfctr = 1 and exposure6 = 1 persistordnl5 = 3.
IF (numterms ge 3) and (exposure6 ge .75) and (spanfctr le 2) persistordnl5 = 4.
IF (numterms ge 3) and (exposure9 ge .75) and (spanfctr le 1.5) persistordnl5 =5.
EXECUTE.

Class 3: Scalar Persistence Measures

Scalar Measure 1. This scalar persistence measure adheres most closely to McClenney and Marti's (2006) "longevity" approach. It averages units attempted over the number of terms in which students attempted classes. All three scalar persistence models give a higher persistence score to more regular term-to-term attendance. This can also be described as fewer terms during the span of terms attended when students did not take classes.

COMPUTE persistscale1 = 0.
COMPUTE persistscale1 = (attm0112/numterms) / spanfctr.
VARIABLE LABELS persistscale1 "(attm0112/numterms) / spanfctr".
* Persistscale1 is based on average units taken per term attended.
* Dividing by spanfctr will increase the quotient proportionately to their consistent course taking.

Scalar Measure 2. This scalar persistence measure emphasizes course taking patterns, counting the proportion of terms they attended in which students attempted six or more units.

```
COMPUTE persistscale2 =0.
COMPUTE persistscale2 = exposure6 / spanfctr.
VARIABLE LABELS persistscale2 "exposure6 / spanfctr".
```

Scalar Measure 3. This scalar persistence measure emphasizes course taking patterns, counting the proportion of terms they attended in which students attempted nine or more units.

```
COMPUTE persistscale3 =0.
COMPUTE persistscale3 = exposure9 / spanfctr.
VARIABLE LABELS persistscale3 "exposure9 / spanfctr".
```

Table E1

Key Variables Used to Compute Ordinal and Scalar Persistence Measures

Variable	Description
attm0112	Total units attempted over the fall 2001 – fall 2012 period
degrlevel	Degree/Cert awarded by level: 1 – Skills Certificate 2 – Cert 18+ Units 3 – Associate
exposure6	Proportion of terms taking 6 or more units
exposure9	Proportion of terms taking 9 or more units
numterms	Number of terms attending any LACCD college between fall 2001 and fall 2012
spanfctr	Span factor: Quotient of span of semesters between first and last terms enrolled to the number of terms actually enrolled. Minimum value, 1.0, indicates no terms skipped. Span Factor = Span of terms attended / number of terms attempting classes OR Span Factor = (last term - first term) / number of terms attempting classes
transfer	Four year institution student transferred to (from Chancellor's office data-on-demand database) 1 – California State University 2 – University of California 3 – In State Private University 4 – Out of State University SPSS function Range(transfer 1,4) returns a value of 1 if student transferred to any of these types of institutions. This is equivalent to a transfer dummy variable.

APPENDIX F

CHI-SQUARE FOR DAY AND NIGHT STUDENTS

Significant differences in day and night attendance between racial and ethnic groups at the nine colleges and cumulatively at the district were noted in examining student behaviors by ethnicity and by college. Table F1 shows which colleges have significantly different day and night populations.

Table F1

Chi Square Analysis of Difference in Day and Night Attendance of Students by Racial Groups at Study Colleges

College	χ^2	p	df	N	Cramer's V	p
District	79.56	.000	3	14,954	.073	.000
City	4.59	.204	3	2,126	.046	.204
East	25.08	.000	3	2,492	.100	.000
Harbor	13.21	.004	3	1,420	.096	.004
Mission	2.34	.505	3	1,349	.042	.505
Pierce	15.36	.002	3	2,339	.081	.002
Southwest(a)	1.15	.766	3	813	.038	.766
Trade	47.13	.000	3	1,315	.189	.000
Valley	16.06	.001	3	1,975	.090	.001
West	20.74	.000	3	1,125	.136	.000

(a) Conditions for Chi Square test are not met. Less than 80% of cells in the crosstabulation have an expected frequency of 5 or more.

APPENDIX G

STUDENTS WHO ALREADY HAVE DEGREES

Students in the original survey sample who held an associate degree prior to enrolling or who had previously transferred to a university were found to represent a different population and were excluded from the study. Figures G1 and G2 graphically represent the unreduced Betas initially entered into the suite of eight regression analyses. The Betas are listed in Tables G1 and G2. The complexity of displaying eight Beta values for each of the 42 independent variables is reduced by excluding the variable names from the figures although the variables are ordered identically in both analyses. A visual inspection shows that the Betas for the subset of the sample who hold degrees or who have previously transferred (N = 247) predict persistence in very different ways from the Betas for the sample subset who did not hold a prior degree (N = 9,331).

This visual comparison is a serendipitous outcome of the Omnibus Outcomes Measure Approach. Comparisons of subsets of the large number of variables can be used to compare how the two sample subsets differ, but that is beyond the scope of this study.

Figure G1

Betas from Eight Regression Models for Students Not Holding a Degree nor Transferred Before 2001

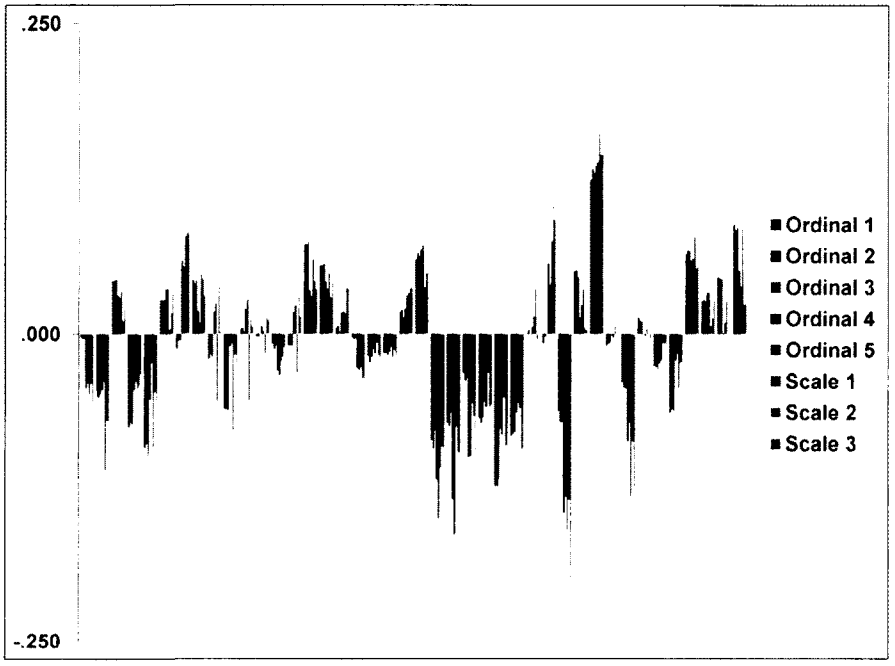

Figure G2

Betas from Eight Regression Models for Students With a Degree or Who Transferred Before 2001

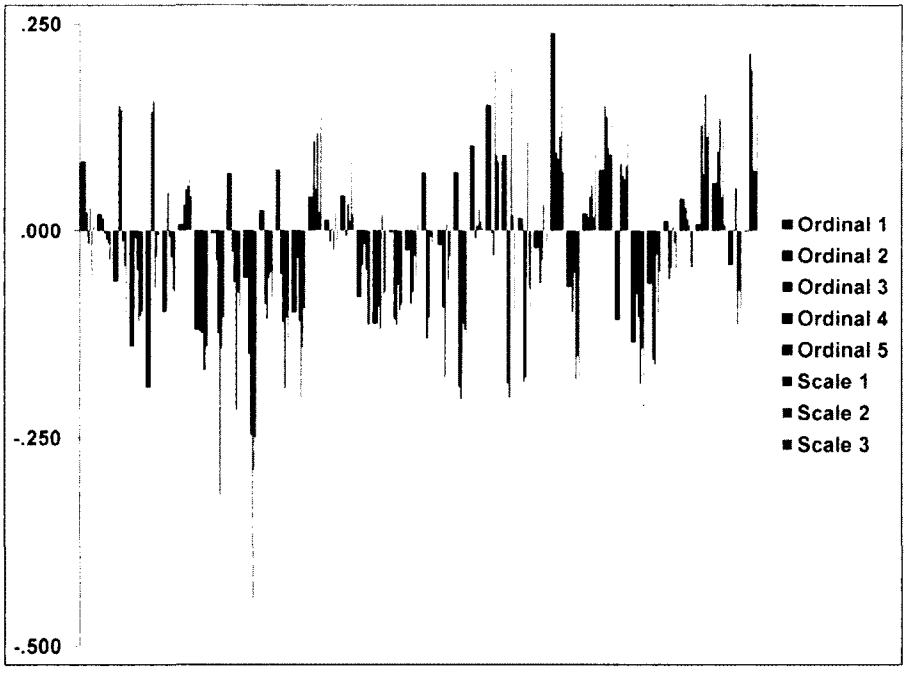

Table G1

Betas from Eight Regression Models for Students Not Holding a Degree or Transferred Before 2001

Independent Variable	Persistence Measure							
	Ordinal 1	Ordinal 2	Ordinal 3	Ordinal 4	Ordinal 5	Scalar 1	Scalar 2	Scalar 3
Gender	-.003	-.004	-.004	-.043	-.040	-.049	-.040	-.056
Truncated Age	-.046	-.051	-.049	-.045	-.039	-.110	-.070	-.096
Ethnicity Dummy ABHW: Asian	.043	.043	.045	.031	.030	.034	.011	.021
Ethnicity Dummy ABHW: Black	-.075	-.072	-.073	-.045	-.038	-.044	-.042	-.033
Ethnicity Dummy ABHW: Hispanic	-.092	-.089	-.098	-.053	-.023	-.092	-.047	-.067
Ethnicity Dummy ABHW: White	.028	.027	.028	.036	.037	.004	.018	.037
Not US Citizen	-.012	-.005	-.006	.059	.054	.079	.092	.082
English NOT Primary language	.043	.041	.043	.019	.009	.051	.045	.031
Education goal: Career prep/advancement	-.020	-.017	-.019	.018	.024	-.054	.039	.001
Education goal: Certificate/degree without transfer	-.061	-.061	-.063	-.010	-.007	-.078	-.017	-.023
Education goal: Transfer with/without degree	.004	.005	.002	.020	.028	-.055	.021	.006
Education goal: Basic skills/HS diploma	-.002	-.002	.001	.006	.002	-.016	.022	.012
Education goal: Personal growth	-.008	-.012	-.009	-.030	-.034	-.022	-.019	-.011
Education goal: Undecided	-.009	-.009	-.010	.018	.023	-.031	.031	.014
Relative family resources averaged by family size	.072	.072	.074	.035	.031	.061	.043	.036
Entering preparation skills index	.055	.055	.057	.042	.037	.049	.030	.043
6. Time I have lived in US	.005	.006	.002	.017	.018	.017	.047	.037
Married status dummy variable	-.003	-.004	-.004	-.027	-.029	-.027	-.036	-.036
Have Children dummy variable	-.018	-.023	-.019	-.012	-.016	-.007	-.018	-.019
Have Disability dummy variable	-.016	-.015	-.017	-.014	-.010	-.019	-.013	-.018
Parents Education Level Mean	.018	.020	.014	.020	.031	.034	.038	.040
Holds only HS diploma or none	.060	.065	.063	.068	.072	.038	.050	.049
Lowest level math taken	-.086	-.092	-.078	-.117	-.150	-.108	-.092	-.093
Lowest level English taken	-.072	-.074	-.063	-.134	-.162	-.075	-.096	-.096
Lowest level ESL taken	-.032	-.037	-.036	-.099	-.099	-.056	-.066	-.101

Table G1 (continued)

Independent Variable	Persistence Measure							
	Ordinal 1	Ordinal 2	Ordinal 3	Ordinal 4	Ordinal 5	Scalar 1	Scalar 2	Scalar 3
% Asians at Primary College	-.068	-.072	-.067	-.054	-.059	-.031	-.059	-.058
% Blacks at Primary College	-.123	-.123	-.118	-.076	-.081	-.051	-.101	-.090
% Hispanics at Primary College	-.082	-.080	-.079	-.063	-.056	-.060	-.095	-.093
Large Primary College	.001	.003	-.001	.006	.014	.037	-.005	-.001
% units at primary college	-.007	-.002	.000	.057	.040	.075	.113	.092
% of courses taken at night	-.062	-.071	-.071	-.145	-.131	-.159	-.134	-.197
% online classes	.051	.051	.046	.013	.023	.036	.005	.004
% terms on financial aid	.125	.133	.130	.135	.138	.163	.145	.162
Scale-Academic Standards	-.009	-.007	-.007	-.001	-.003	.006	.000	.002
15. How many hours a week do you work?	-.038	-.043	-.044	-.087	-.071	-.131	-.087	-.126
Scale-Satisf College Personnel	.013	.011	.010	.000	-.001	.005	.001	-.004
Scale-Satisf Engmt Outside Class	-.025	-.026	-.029	-.023	-.021	-.007	-.007	-.008
Scale-Satisf Facilities Services	-.063	-.061	-.062	-.021	-.015	-.043	-.023	-.035
Scale-Engagement with Stud Servs	.065	.068	.067	.059	.061	.079	.054	.068
Scale-Engagement In-Class	.027	.028	.027	.033	.034	.007	.013	.028
Scale-Engmt Acad Outside Class	.046	.045	.045	.001	.010	.027	-.002	.006
Scale-Engmt Social	.089	.084	.087	.051	.039	.085	.025	.055

Table G2

Betas from Eight Regression Models for Students with a Degree or Who Transferred Before 2001

Independent Variable	Persistence Measure							
	Ordinal 1	Ordinal 2	Ordinal 3	Ordinal 4	Ordinal 5	Scalar 1	Scalar 2	Scalar 3
Gender	.084	.084	.084	.023	-.016	.028	-.056	.009
Truncated Age	.021	.021	.021	.016	-.003	-.011	-.015	-.035
Ethnicity Dummy ABHW: Asian	-.061	-.061	-.061	.151	.146	-.013	-.044	-.109
Ethnicity Dummy ABHW: Black	-.140	-.140	-.140	-.009	-.047	-.110	-.104	-.098
Ethnicity Dummy ABHW: Hispanic	-.190	-.190	-.190	.144	.158	-.069	-.032	-.005
Ethnicity Dummy ABHW: White	-.098	-.098	-.098	.046	-.008	-.031	-.072	-.077
Not US Citizen	.008	.008	.008	.031	.050	.055	.069	.042
English NOT Primary language	-.120	-.120	-.120	-.122	-.125	-.169	-.172	-.141
Education goal: Career prep/advancement	-.004	-.004	-.004	-.036	-.125	-.319	-.144	-.106
Education goal: Certificate/degree without transfer	.070	.070	.070	-.025	-.063	-.217	-.075	-.096
Education goal: Transfer with/without degree	-.057	-.057	-.057	-.150	-.247	-.444	-.290	-.250
Education goal: Basic skills/HS diploma	.025	.025	.025	-.089	-.107	-.058	-.051	-.082
Education goal: Personal growth	.074	.074	.074	-.053	-.111	-.192	-.106	-.130
Education goal: Undecided	-.100	-.100	-.100	-.032	-.110	-.202	-.142	-.094
Relative family resources averaged by family size	.041	.041	.041	.109	.050	.118	.024	.146
Entering preparation skills index	.014	.014	.014	-.014	.002	-.024	.023	-.012
6. Time I have lived in US	.042	.042	.042	-.007	.032	.013	.096	.021
Married status dummy variable	-.081	-.081	-.081	-.041	-.016	-.048	-.119	-.114
Have Children dummy variable	-.113	-.113	-.113	-.092	-.118	.020	-.078	-.075
Have Disability dummy variable	-.002	-.002	-.002	-.107	-.115	-.065	-.098	-.090
Parents Education Level Mean	-.023	-.023	-.023	-.089	-.074	-.030	-.056	.007
Holds only HS diploma or none	.071	.071	.071	-.130	-.105	-.008	-.016	.004
Lowest level math taken	-.018	-.018	-.018	-.093	-.178	.008	-.061	-.031
Lowest level English taken	.071	.071	.071	-.190	-.203	-.113	-.122	-.141
Lowest level ESL taken	.103	.103	.103	-.010	.006	.027	.012	.003

Table G2 (continued)

Independent Variable	Persistence Measure							
	Ordinal 1	Ordinal 2	Ordinal 3	Ordinal 4	Ordinal 5	Scalar 1	Scalar 2	Scalar 3
% Asians at Primary College	.152	.152	.152	-.003	-.030	.197	.092	.084
% Blacks at Primary College	.091	.091	.091	-.185	-.202	.196	.020	-.104
% Hispanics at Primary College	.016	.016	.016	-.183	-.177	.109	-.070	-.106
Large Primary College	-.021	-.021	-.021	-.064	-.036	.033	.000	-.016
% units at primary college	.239	.239	.239	.094	.087	.115	.157	.071
% of courses taken at night	-.068	-.068	-.068	-.099	-.050	-.181	-.153	-.185
% online classes	.022	.022	.022	.017	.042	.055	.017	.095
% terms on financial aid	.074	.074	.074	.151	.138	.100	.092	.258
Scale-Academic Standards	-.108	-.108	-.108	.082	.067	.063	.079	.125
15. How many hours a week do you work?	-.135	-.135	-.135	-.076	-.104	-.186	-.143	-.217
Scale-Satisf College Personnel	-.064	-.064	-.064	-.156	-.162	-.028	-.100	-.050
Scale-Satisf Engmt Outside Class	.012	.012	.012	-.059	-.045	.006	-.015	-.046
Scale-Satisf Facilities Services	.039	.039	.039	.028	.014	.007	-.044	-.045
Scale-Engagement with Stud Servs	.008	.008	.008	.128	.069	.167	.115	.135
Scale-Engagement In-Class	.058	.058	.058	.095	.136	.041	.138	.007
Scale-Engmt Acad Outside Class	-.041	-.041	-.041	.001	.052	-.115	-.074	-.095
Scale-Engmt Social	-.001	-.001	-.001	.215	.193	.074	.073	.147

APPENDIX H

MULTIPLE ANALYSES FOR DATA REDUCTION

Removing Education Goals from the Regression Equation

Table H1 shows the significance of Beta values for education goal variables in explaining persistence dependent variable in each of the eight models explored.

Table H1

Significance of Betas for Education Goals in Eight Regression Models

Education Goal	Persistence Model							
	Ordinal 1	Ordinal 2	Ordinal 3	Ordinal 4	Ordinal 5	Scale 1	Scale 2	Scale 3
Career prep/ advancement	.551	.615	.576	.575	.445	.082	.240	.968
Certificate/degree without transfer	**.012**	**.011**	**.009**	.668	.747	**.000**	.469	.306
Transfer with/ without degree	.916	.893	.956	.582	.445	.122	.576	.854
Basic skills/ HS diploma	.905	.902	.977	.734	.905	.352	.231	.487
Personal growth	.588	.400	.510	**.031**	**.013**	.097	.173	.402
Undecided	.752	.763	.724	.522	.408	.247	.277	.604

Note: Beta significance values, $p < .05$, shown in **bold** print.

Table H2 shows the limited effect on the variance explained in each of the eight multiple regression analyses when the six self-reported education goals were removed as independent variables. Adjusted R^2 dropped by between .001 and .003 or no more than 2%.

Table H2

Comparison of Variance Explained for Models Including and Excluding Self-Reported Educational Goals

Persistence Model	Adjusted R^2 Education Goals Included	Adjusted R^2 Education Goals Excluded
Ordinal 1	.135	.133
Ordinal 2	.145	.142
Ordinal 3	.136	.133
Ordinal 4	.200	.199
Ordinal 5	.215	.214
Scale 1	.249	.246
Scale 2	.171	.169
Scale 3	.261	.260

Removing Other Independent Variables from the Regression Equation

Table H3 displays which independent variables remained significant when the six educational goal variables were eliminated from the multiple regression equation and the suite of regressions was run.

Table H3

Significance of Regression Variables after First Elimination of Dependent Variables

Independent Variable	Persistence Measure							
	Ordinal Measures					Scalar Measures		
	1	2	3	4	5	1	2	3
Gender	.646	.530	.523	S	S	S	S	S
Truncated Age	S	S	S	S	S	S	S	S
Race/Ethnicity Asian	S	S	S	.052	.058	.046	.552	.223
Race/Ethnicity Black	S	S	S	S	S	S	S	S
Race/Ethnicity Hispanic	S	S	S	S	.261	S	S	S
Race/Ethnicity: White	.118	.116	.110	S	S	.850	.276	S
Not US Citizen	.352	.645	.631	S	S	S	S	S
English NOT Primary language	S	S	S	.112	.451	S	S	S
Relative family resources averaged by family size	S	S	S	S	S	S	S	S
Entering preparation skills index	S	S	S	S	S	S	S	S
6. Time I have lived in US	.755	.673	.882	.215	.185	.198	S	S
Married	.877	.784	.812	S	S	S	S	S
Have Children	**.103**	**.044**	**.090**	**.336**	**.192**	**.445**	**.150**	**.074**
Have Disability	**.107**	**.110**	**.073**	**.123**	**.262**	**.043**	**.182**	**.045**
Parents Education Level Mean	.130	.101	.256	.094	S	S	S	S
Holds HS diploma	S	S	S	S	S	S	S	S
Lowest level math taken	S	S	S	S	S	S	S	S
Lowest level English taken	S	S	S	S	S	S	S	S
Lowest level ESL taken	S	S	S	S	S	S	S	S
% Asians at Primary College	S	S	S	S	S	S	S	S
% Blacks at Primary College	S	S	S	S	S	S	S	S
% Whites at Primary College	S	S	S	S	S	S	S	S

Table H3 (continued)

Independent Variable	Persistence Measure							
	Ordinal Measures					Scalar Measures		
	1	2	3	4	5	1	2	3
Large Primary College	**.963**	**.858**	**.864**	**.691**	**.250**	**S**	**.561**	**.863**
% units at primary college	.662	.953	.740	S	S	S	S	S
% of courses taken at night	S	S	S	S	S	S	S	S
% online classes	S	S	S	.169	S	S	.624	.653
% terms on financial aid	S	S	S	S	S	S	S	S
Scale-Academic Standards	**.510**	**.608**	**.626**	**.990**	**.909**	**.503**	**.934**	**.783**
Weekly work hours	S	S	S	S	S	S	S	S
Scale-Satisfaction with College Personnel	**.268**	**.392**	**.405**	**.920**	**.782**	**.695**	**.970**	**.637**
Scale-Satisfaction with Engmt Outside Class	S	S	S	S	S	.585	.540	.471
Scale-Satisfaction with Facilities Services	S	S	S	.046	.140	S	S	S
Scale-Engagement with Stud Servs	S	S	S	S	S	S	S	S
Scale-Engagement In-Class	S	S	S	S	S	.575	.290	S
Scale-Engmt Acad Outside Class	S	S	S	.993	.490	S	.862	.639
Scale-Engmt Social	S	S	S	S	S	S	S	S

Rows shown in **bold** type indicate the variables is a candidate for elimination.

Variables in a multiple regression equation can be intertwined through their intercorrelations. To test whether I would remove each of the five candidate variables from the equation I set as criteria that removing each variable independently, and all five collectively, would not lower the variance explained in any of the eight multiple regression analyses or lower the ANOVA F value in each case.

Table H4 shows the effect on the variance explained and the ANOVA F value of removing the five independent variables identified from Table 21 for removal from the multiple regression analysis. The test was conducted separately for each variable with the other four variables still in the equation but only the results of removing all five variables are reported here.

Table H4

Effect on Variance Explained of Removing Independent Variables from Analysis

Output Measure	Adj R^2	F	Adj R^2 Variable Removed	F Variable Removed	Effect on F
Ordinal 1	.132	40.503	.133	47.313	↑
Ordinal 2	.142	43.781	.142	51.077	↑
Ordinal 3	.133	40.751	.133	47.475	↑
Ordinal 4	.199	65.283	.199	76.293	↑
Ordinal 5	.213	71.079	.214	83.262	↑
Scale 1	.247	85.946	.246	99.753	↑
Scale 2	.169	53.700	.169	62.711	↑
Scale 3	.260	92.268	.260	107.161	↑

Table H5 shows the significant standardized regression coefficients, Beta, for the independent variables in multiple regression analyses of four engagement scales entered as dependent variables in four separate analyses.

Table H5

Standardized Regression Coefficients of Independent Variables for Single-Block Regressions on Four Engagement Dependent Variables

	Engagement with Student Services		In Class Engagement		Academic Engagement		Social Engagement	
	β	*p*	β	*p*	β	*p*	β	*p*
Independent Variables								
Gender		.734		.121	-.038	.000		.081
Age	.070	.000	.070	.000	.043	.000	.042	.001
Asian	.038	.019	-.043	.006	-.045	.003		.410
Black	.039	.010		.331		.972		.090
Hispanic		.371	-.051	.011	-.094	.000		.226
White		.325		.233		.311		.545
Not US Citizen		.994		.662		.652		.285
English NOT Primary language		.173		.980		.140	-.037	.004
Ed goal: Career prep/advancement		.218		.650		.409		.460
Ed goal: Certificate/ degree without transfer		.689		.873		.381		.931
Ed goal: Transfer with/without degree		.941		.730		.690		.070
Ed goal: Basic skills/HS diploma		.118		.438		.382		.117
Ed goal: Personal growth		.405		.738		.683		.261
Ed goal: Undecided		.233		.459		.356		.157
Relative family resources	-.056	.000		.434	-.023	.022	-.031	.005
Entering preparation skills index	-.063	.000	.070	.000		.221	-.027	.012
Time lived in US	-.037	.008		.436		.635	-.030	.050
Married	-.023	.027		.789		.924		.646
Have Children		.606	.022	.045		.414		.369
Have Disability	.051	.000		.650	.018	.042	.039	.000
Parents Education Level Mean	.027	.019	.066	.000	.061	.000	.072	.000
HS diploma		.246		.126	-.033	.000		.258
Lowest level math	-.062	.000	.038	.001	.033	.002		.277
Lowest level English	-.043	.000		.795	.039	.000		.232
Lowest level ESL		.760		.643	.025	.020		.905
Number of terms	.062	.000	.061	.000	.074	.000	.049	.000

Table H5 (continued)

	Engagement with Student Services		In Class Engagement		Academic Engagement		Social Engagement	
	β	*p*	β	*p*	β	*p*	β	*p*
Ratio of Span to sum of terms attended		.694		.703		.123	-.031	.003
Proportion of terms taking 6+ units		.820		.653	-.030	.017	-.054	.000
Proportion of terms taking 9+ units	.102	.000	.078	.000	.084	.000	.119	.000
Percent Asian		.084		.168		.142	.029	.035
Percent Black		.838	.063	.000	.048	.003	.076	.000
Percent Hispanic		.914	.070	.000	.031	.014	.052	.000
Large Primary College		.058		.131		.046	.029	.012
% units at primary college		.603		.198		.559		.664
% of courses taken at night	-.096	.000	.026	.013	-.025	.012		.084
% online classes	-.042	.000	-.048	.000	-.022	.016	-.035	.001
% terms on financial aid	.182	.000	.030	.004	.037	.000	.030	.008
Scale-Academic Standards	.192	.000	.347	.000	.369	0.000	.165	.000
Work Hours per week		.794		.052		.764		.192
Satisfaction - College Personnel		.123	.132	.000	.208	.000	.045	.000
Satisfaction - Facilities Services	.110	.000		.075	.026	.006	.038	.000