

**A Longitudinal Investigation of College Student Engagement as Predictors of
College Student Outcomes**

BY

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THESIS

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LIST OF ABBREVIATIONS

CSEQ College Student Experiences Questionnaire

NSSE National Survey of Student Engagement

SUMMARY

Given the high cost of university education in the United States, and the economic disadvantages of leaving college without a degree, university administrators are eager to find ways of improving graduation rates. Using survey data, the current study examined both individual and institutional predictors of college outcomes among a sample of 510 college freshmen at a large urban public university with a highly diverse student body. Data were obtained using the College Student Experiences Questionnaire focusing specifically on benchmarks of student engagement, including: the amount of Student-Faculty Interaction, perceptions of Supportive Campus Environment, frequency of Diversity Experiences on campus, the use of Active and Collaborative Learning techniques, and the Level of Academic Challenge. Logistic regression analyses revealed that student engagement benchmarks were predictive of four-year graduation, six-year graduation, first-year GPA and retention outcomes, with some variation observed across racial groups. Potential theoretical explanations are offered, and practical implications for university administrators are discussed, both in terms of main effects and group differences graduation and GPA.

I. INTRODUCTION

A. The Current State of College Dropout in the United States

College dropout is an issue of national importance in the United States (U.S.). Of the 3.2 million students who will enroll in an American institution of higher education for the first time this year, only one in two will eventually receive a degree (Digest of Education Statistics, 2011). A longitudinal study conducted by the National Center for Education Statistics (2003) found that by 2005, 35% of students who had enrolled in a four-year institution were no longer enrolled, and had not completed a degree (Berkner, Choy, & Hunt-White, 2008). Comparatively, for two-year institutions, 60% of students who entered school in 2003 were no longer enrolled two years later, and had not obtained a degree (Aud, Hussar, Kena, Bianco, Frolich, Kemp & Tahan, 2011).

Despite an increase in national college enrollment, American students today are currently less likely to finish their degrees than students were ten years ago. Furthermore, national trends indicate that those who do graduate take a longer time to do so (Bound et al., 2007). Data from the NCES indicate that only 44% of first time degree recipients at four-year institutions completed their degree within 48 months. An additional 23% of graduates completed their degree within 48 and 60 months of enrollment, and 9% completing their degree in upwards of 60 months (Department of Educations, 2012). In fact, this trend is so pervasive that most national college research uses six-year graduation rather than four-year graduation as the outcome of interest.

B. College Completion and the “Knowledge Economy”

The impact of not having a college degree is much greater now than it was 30

years ago in the U.S., owed in large part to changes in the economy. These changes have made the consequences of dropping out of college far more significant now than they were in the past. In recent years, the U.S. has been gradually shifting to what economists have termed a “knowledge economy.” Powell and Snellman (2004) define the knowledge economy as: “production and services based on knowledge-intensive activities that contribute to an accelerated pace of technical and scientific advance, as well as rapid obsolescence” (p.199). A knowledge economy relies heavily on an intellectually skilled workforce for technical jobs rather than physical ones (Powell & Snellman, 2004).

The economic demand for specialized skill sets leaves individuals without a specialized degree with fewer employment opportunities than college graduate counterparts. With increases in technology, manual labor jobs are often being replaced with automated processes, and the new jobs that are created to run those systems are given to those with college degrees (Powell & Snellman, 2004).

As a result of these differences in employment demand between college-degreed and non-degreed students, large disparities are found in rates of unemployment and in earning power between these groups. For example, current reports from the National Bureau of Labor Statistics show that the rate of unemployment for those with a high school degree and no college (8.2%) is nearly double the rate for those with a college degree (4.2%) (Bureau of Labor Statistics, 2012). Likewise, data from the U.S. Census Bureau reveal that college graduates’ lifetime earnings (\$2.1 million) are nearly double those of individuals with high school degrees or GED equivalents alone (\$1.2 million) (Cheeseman Day & Newburger, 2002). In terms of annual earnings, incrementally higher earnings by degree are observed from high school dropouts’ markedly low \$18,900

compared to college graduates' \$45,400. Professional degrees earners outpaced those non-degree earners by a staggering \$80,000 (M.D., J.D., D.D.S., or D.V.M.) (U.S. Census Bureau, 1998,1999 and 2000 in Cheeseman Day & Newburger, 2002).

The impact of lower earnings is further compounded when one considers the rising cost of living in the United States. According to the U.S. Census Bureau, every year between 1990 and 2010, the Consumer Price Index, which measures of cost of living, has increased an average of 2.6% (U.S. Census Bureau, 1999,1999, 2000 in Cheeseman Day & Newburger, 2002). As a result, those who have not completed a more specialized degree will find it increasingly difficult to meet the financial demands of living in the U.S. over time relative to their counterparts who have completed a college degree.

C. Frameworks Used in Research on College Retention

College retention is clearly a point of interest for university administrators. Higher education research has traditionally aimed to identify and target factors that contribute to college completion. This question can be viewed through three distinct lenses: an individual profile lens, an institutional policy lens, or an interactionist lens, which looks at the individual within the context of the institution.

1. Retention Research within the Individual Profile Framework

The individual profile lens focuses on the individual factors that contribute to student attrition, for example, academic achievement, stress, socioeconomic status, psychological profiles, ability level, and parent education. Students bring these uniquely individual factors into any institution that they attend.

Many studies conducted within institutional research facilities at universities

operate within this framework, using demographic information to determine differential dropout profiles overall. Typically, individual profile studies of college dropout try to answer the question: How do students who drop out differ from those who do not? These studies focus on identifying student risk factor profiles to target students for intervention. Furthermore, this research often concentrates on demographic background variables, but may also examine such psychological indices as cognitive functioning, personality profile, and/or utilization of coping mechanisms as predictors of school dropout. For instance, Wintre and Bowers (2007) investigated whether psychological well-being, parenting style, and adjustment to the university play a role in the prediction of dropout among Canadian commuter students. They found that gender, parental support, stress, depression, and first-year GPA were significant predictors of student persistence (Wintre et al., 2007). In another example of work within the individual profile framework, Ryland, Riordan, and Brack (1994) found that demographic and retention variables, such as intent to leave, employment, financial support, living arrangements, and encouragement to attend college were good predictors of college dropout.

As these studies indicate, the individual profile framework does not consider institutional characteristics or policies and their role in the college dropout.

2. Retention Research Within the Institutional Policy Framework

The institutional policy framework focuses on the role that campus setting, culture, and policy plays in overall student retention rate. Studies operating within this framework aim to answer the question: What policy or programming can be developed to raise student retention at a given institution? Thomas (2002) explains that the institutional policy framework takes the student out of the equation entirely, and puts the burden of

improving college retention rates back on the institution. She adds that this type of research does not focus on the question ‘why do *students* fail to complete’ but instead focuses on identifying ways in which *institutions* can better support students (Thomas, 2002, p. 425).

One example of a variable that has received attention within the institutional policy framework is campus diversity climate (Chang, 2001; Chang, Denson, Sáenz, & Misa, 2006). Museus et al. (2008) found that perceived campus racial climate was the most powerful positive predictor of institutional commitment for students who identified as Asian, Black, Latina/o, and White. Studies within this framework focus on the institutional climate and characteristics that affect student retention rates overall.

Other studies have examined the effect of university policy and intervention efforts on student retention. These studies have considered, for example, the effects of financial aid policies at an institution on college dropout (St. John, Paulson, & Starkey, 1996; Bettinger, 2004), and the positive effects of first-year seminars (Keup & Barefoot, 2005), supplemental instruction programs (Bowles, McCoy, & Bates, 2008) and specialized learning communities (Zhao & Kuh, 2004) on student outcomes.

3. Retention Research Within the Interactionist Framework: Combining Individual and Institutional Factors

Still another perspective that has received attention in the college retention and dropout literature is the interactionist perspective. Whereas the individualist framework focuses exclusively on student characteristics and the institutional policy framework focuses exclusively on institutional characteristics, the interactionist framework focuses on how both student and institutional characteristics work together to produce student

outcomes. These person-environment interaction theories are loosely based on the classic work of Emile Durkheim (1951), who concluded that suicide was a result of a lack of integration of the individual into society. He argued that the less integrated an individual is into a society, and the more strain that individual feels as a result, the more likely he or she is to commit suicide. Durkheim explained that historically, societies become united in circumstances of war or disaster, and individuals feel more integrated into the societal fabric, in turn explaining the decrease in suicide rate that is seen in times of strife.

Applying Durkheim's theory to the college experience, educational and psychological research explains that it is the integration of the student into the institutional environment that determines student outcomes, or their fit into educational institutions and the impact of that fit on student outcomes (Tinto, Spady, Astin, Pascarella, and Terenzini). Along these lines, Tinto found that students' decisions to leave college were predicted by their level of intellectual and social integration into the life of the institution (Tinto, 1982). Likewise, students' social and academic interactions on campus affect overall student social integration, which, in turn, affects students' satisfaction, commitment to college, and decisions to drop out. According to these models, the more integrated a student feels into the fabric of the university, the less likely he or she is to drop out.

The prominent issue taken with Tinto's model is its one-size-fits-all approach and its failure to consider how his model may apply to culturally diverse or to nontraditional student populations (Tierney, 1992). For instance, most of the samples used to develop this theory, and to identify factors influencing student persistence were taken from students living on campus and entering college straight after high school, at primarily

white institutions (Tierney, 1992). And work by Torres and Solberg (2001) suggests that the social integration piece of Tinto's model does not predict persistence of Latino student populations, in two-year community colleges. Tinto has since addressed these concerns, but more research is still needed to validate this model in nontraditional populations.

Alexander Astin's (1993) Input-Environment-Output (I-E-O) model is another key example of research within the interactionist framework. In this model, a student's background characteristics (Input) interact with the student's school environment (Environment) and this combination of student characteristics and environment predicts student outcomes (1993).

Tinto's and Astin's interactionist frameworks are arguably the most useful for university administrators. Not only does the interactionist perspective more easily lend itself to the development of campus-wide programming to promote student retention, but it provides information as to the best strategies relevant to specific student groups. In contrast, individual student profile frameworks do not take into account environment, and institutional frameworks overlook student backgrounds.

D. Individual Student Characteristics

1. Racial Demographic

One of the individual characteristics that has been most researched in conjunction with institutional factors in education is racial demographic. There are many studies indicating that racial background plays an important role in college attrition and persistence. National reports indicate that certain racial groups have differential mean rates of college completion, with some groups being at a statistical disadvantage. An

NCES report from 2012 indicates that African American and Latino students were 22% and 21% less likely, respectively, to graduate than their white peers, who graduated at a rate of 73% (Ross, Kena, Rathbun, KewalRamani, Zhang, Kristapovich, & Manning, 2012).

At the large urban public university where this study took place, there is a racial gap in students' six-year graduation outcomes. As reported in the institution's annual report of student graduation outcomes, (whose name is kept anonymous to avoid revealing institution identity) 35% of students who self-identified as African-American students complete a degree within six years, compared to 61% of students who self-identified as Asian-American, 44% of students who self-identified as Latino, and 57% of students who self-identified as White. What is more, while the rate of enrollment in institutions of higher education has increased steadily since 2006 for all races, racial enrollment gaps remain (Data obtained from annual university outcomes report, 2012).

In light of different racial and ethnic entrance and completion rates, a compelling question within the interactionist perspective emerges: how do campus practices and policies affect diverse racial groups. For instance, in their examination of the campus experiences of African American and White students, Cabrera, Nora, Terenzini, Pascarella, and Hagedorn (1999) found that African American students entered school with a lower precollege achievement record than white students, but these students also reported that they had made greater gains in quantitative and analytical skills than their peers did (Cabrera et al., 1999). Although no differences in perceived prejudice on campus, or institutional commitment were observed in this study, African American students were less likely than white students to report positive experiences with peers

(Cabrera, et al., 1999).

Differential patterns in the campus experiences of racially diverse groups may help educators to use policy-based intervention to provide targeted support according to the needs of different groups.

2. **Family Demographics**

Another well-studied individual factor influencing students' likelihood of graduating is that of family background. A students' family history of educational attainment and in financial status represent influences that a student carries into the campus environment. For example, parent education has been well established as a significant predictor of student attrition and completion, such that lower parent educational attainment indicates a higher likelihood of student dropout (Pascarella & Chapman, 1983; Pascarella & Terenzini, 1978, 1980,1983; Stage, 1988). Relatedly, students who are the first in their families to attend college are more likely than their peers to leave college before obtaining a degree (Horn, 1998; Ishitani, 2003, Nunez & Cuccaro-Alamin, 1998).

This finding may be partially explained by the significant positive correlation between parent educational attainment is socioeconomic status. Bui's (2002) findings reveal that "First-generation college students (n = 64) were more likely to come from a lower socioeconomic background, to report that they were pursuing higher education to help their family out financially after they complete college, and to worry about financial aid for college" (p. 3). Each individual student enters into college with vastly different financial needs.

As one would expect, there is also mounting evident that the amount of financial

assistance that a student receives is a significant factor in a student's decision to leave college. Work by Singell (2002) revealed that, while subsidized loans positively predicted student retention, unsubsidized loans did not (Singell, 2002). This study also found that financial aid options that require more immediate forms of repayment, either in the form of loans or work hours, actually lowered students' probability of re-enrolling (Singell, 2002). Findings by Chen and DesJardins (2010) also indicate that the impact of financial aid on students' risk of dropping out of college varied by racial group, such that for minority students (especially for self-identified Asian American students) larger Pell Grants were positively predictive of college completion. This effect was not as strong for White students (Chen and DesJardins, 2010). These studies suggest that financial aid and financial need are important factors to consider in college completion research.

3. Pre-College Academic Variables

In the conversation about college attrition, the most common student profile variables examined in studies of student retention are standardized test scores and high school GPA. These variables are used as indices of individual academic achievement and continue to be important in college admissions decisions.

Most of the literature indicates that standardized test scores positively relate to student outcomes in college. In their book *Crossing the Finish Line* (2009), Bowen, Chingos and Mcpherson reviewed a number of higher education publications and found that high school grades and ACT and SAT scores, are all positively predictive of students' later college outcomes. They found that, of these three, high school GPA was the strongest predictor of college GPA, such that higher high school GPA was related to higher college GPA as well (Bowen, Chingos, & Mcpherson, 2009). The same can be

seen in a longitudinal study by Harackiewicz, Barron, Tauer, and Elliot (2001), which also identified ACT score, SAT score and High School Percentile Rank as positive predictors of college completion. Despite the popularity of, and reliance on, standardized test scores in college admissions decisions, standardized test scores were not the only or the strongest high school predictors of college outcomes. Factors like course interest and goal motivation were identified as positive predictors as well (Harackiewicz, et al., 2001).

E. Institutional Characteristics: Student Engagement

One of the key variables to emerge from interactionist research on student integration is student engagement. Students who are more engaged in university life, and feel more integrated, show more positive academic outcomes than less engaged counterparts, and are likewise more likely to graduate from that institution (Tinto, 1982). If student engagement is a proposed driving construct that can predict eventual student outcomes, then understanding its composition and meaning is important.

Originally referred to as “time on task” in the 1930s, the student engagement construct has evolved over time. In the 60s, the term “quality of effort” (Pace, 1982) generally replaced “time on task” in the literature. Later, Astin (1984) began to use the term “student involvement” which evolved into Tinto’s “student integration” (1987;1997) and later, into “student engagement” (Kuh, Cruce, Shoup, & Kinzie, 2008). One of the largest and earliest national measures of student engagement was the College Student Experiences Questionnaire (CSEQ), which was developed by Robert Pace in 1979, and revised by Pace and Kuh in 1998. Shortly thereafter, the authors of the CSEQ called together a workgroup to begin the design of a highly related survey, the National Survey of Student Engagement. The CSEQ and the NSSE contain many overlapping concepts.

The NSSE focuses more specifically on student engagement, whereas the CSEQ focuses more broadly on the student experience, which also includes many measures of engagement. Although the NSSE is newer, the longevity of the CSEQ lends itself more easily to longitudinal outcome research at the present moment.

Recently, using a combination of theoretical and empirical factor analysis of NSSE data, the Indiana University Center for Postsecondary Research (2000) has proposed five benchmarks comprising student engagement including:

- 1) Student-Faculty Interaction (NSSE, 2007; Kuh et al., 2008); which measures students' perceptions of their relationships with faculty members (NSSE, 2007; Kuh, et al., 2008);
- 2) Supportive Campus Environment, which assesses the overall quality of relationships on campus, with other students, staff, and faculty members (NSSE, 2007; Kuh, et al., 2008);
- 3) Enriching Educational Experiences, hereby be referred to as "Diversity Experiences", assesses students' experiences with diversity and diverse learning opportunities on campus (NSSE, 2007; Kuh, et al., 2008);
- 4) Active and Collaborative Learning, assessing students' active participation in class, which includes asking questions in class, making class presentations, applying course material outside of class, discussing course ideas with classmates, and tutoring or teaching other students (NSSE, 2007; Kuh, et al., 2008); and,
- 5) Level of Academic Challenge, which refers to the amount of time students spend on coursework, the number of course projects, and the extent to which courses require student to think analytically, synthesize information, and apply theories (NSSE, 2007; Kuh, et al., 2008).

These five benchmarks of student engagement have only recently emerged and have not yet been individually studied in terms of predictive validity. When aggregated

together into an overall student engagement score, these five benchmarks were also found to positively predict first-year GPA and persistence to the second year, after controlling for student background characteristics (Kuh et al., 2008). Research by Pascarella, Seifert and Blaich (2010) indicates that each of these five benchmarks of student engagement were significantly predictive of seven positive student outcomes, including effective reasoning and problem solving, moral character, inclination to inquire and lifelong learning, intercultural effectiveness and personal well-being. The five benchmarks have not yet been individually, directly linked to student graduation or academic marks using survey measures.

1. Student-Faculty Interaction Benchmark of Student Engagement

Conceptually, the first domain of student engagement, Student-Faculty Interaction, has historically emerged as an important factor in dropout literature. In one of the early studies testing Tinto's (1975, 1987) and Spady's (1971) institutional interaction models, Pascarella and Terenzini (1979) found that the frequency of informal contact with faculty members and the quality of student-faculty relationships were significant predictors of student persistence. This positive effect of informal student-faculty interaction is seen across a diverse array of student outcomes:

“A synthesis of results indicates that, with the influence of student pre-enrollment traits held constant, significant positive associations exist between the extent and quality of student-faculty informal contact and students' educational aspirations, their attitudes toward college, their academic achievement, intellectual and personal development, and their institutional persistence” (Pascarella & Terenzini,

1980, p. 545)

Specific contexts of Student-Faculty Interaction have since been examined. Kim and Sax (2009) found that participating in research and scholarship with a faculty member is positively related to a host of student outcomes, including higher GPA, higher degree aspirations, and larger gains in critical thinking across student demographics. This work also suggests that the amount of faculty contact, the nature of that contact, and the consequent effect of that contact differed by racial demographic (Kim & Sax, 2009). Specifically, they found that for African American students, research-related contact with faculty was an especially positive predictor of later GPA compared to the other groups. In contrast, course-related contact was associated with positive outcomes in all other groups but African American students (Kim & Sax, 2009). Ironically, descriptive statistics revealed, that, African American students were the group *most* likely to report high course-related contact with faculty members, and were the *least* likely to report research-related faculty contact (Kim & Sax, 2009). This literature implies that the nature of the contact between faculty members and students is important to consider in the development of targeted student interventions.

2. **Supportive Campus Environment Benchmark of Student Engagement**

The Supportive Campus Environment benchmark has been found to be an important predictor of student persistence. According to the interactionist perspective, a student's sense of belonging and fit on campus is predictive of later persistence, thus, the quality of students' relationships with peers, faculty, and campus staff members is an important factor to consider in student integration.

In the transition from high school to adulthood, peers become the primary attachment figure and thus represent a highly influential force in a college students' life (Laursen & Collins, 2011; Fraley & Davis, 1997). In high school, students spend time with friends, but still rely heavily on parents for emotional support. During the college transition, often, students move away from family, and begin to seek more support from friends regarding major life events (Fraley & Davis, 1997).

This shift to a greater reliance on peers can be seen in the changing predictive value of peer relationship on student outcomes over time. In high school, the quality of students' attachment to their parents, but not peers, is positively predictive of adjustment in times of stress (Swenson, Nordstrom, & Hiester, 2008). In college, however, students' attachments to peers have a stronger effect on student outcomes than counterparts did in high school. For example, satisfying peer relationships on campus have been found to positively influence students' satisfaction with and ratings of their scholastic competence, and social and emotional adjustment (Fass & Tubman, 2002; Friedlander, Reid, Shupak, & Cribbie, 2007). Additionally, students who reported sharing trust and common interests with a new college friend had higher GPAs and were more likely to persist into their sophomore year (Swenson et al., 2010). These findings indicate that a student's ability to form new, quality attachments with peers in college is important for adjustment and persistence at an institution.

While these supportive campus relationships have been found to influence student outcomes, there is evidence that students of varying racial demographics experience on-campus relationships (with faculty, peers, teaching assistants, and staff) differently. For instance, Ancis, Sedlacek, and Mohr (2000) found that African American students

reported more racial conflict on campus than did students of other groups on a large diverse mid-Atlantic University. Self-identified Asian American students and African American students reported that the campus had less respect for different racial backgrounds than White students reported (Ancis et al., 2000). Relatedly, African American, Asian American and Latino/a students reported that they experienced pressure to conform to academic stereotypes, and to minimize any racial-group-identifying characteristics (e.g., language and dress) in order to be accepted (Ancis et al., 2000). Furthermore, African American students and Asian American students reported more experiences of faculty racism (Ancis et al., 2000). New qualitative work by Solorzano, Ceja and Yosso (2000) suggests that African American students' view of campus racial climate is influenced by both overt racism and experiences of racial microaggressions on campus, in the form of decreased faculty attention and expectations, classroom/study group segregation, and increased police presence at African American student events. These negative experiences are consistent with observed lower ratings of campus support and relationships for African American students (Solorzano, Ceja, and Yosso, 2000).

3. Enriching Educational Experiences (Diversity Experiences)

Benchmark of Student Engagement

Another benchmark of student engagement, Diversity Experience (National Survey of Student Engagement, 2007; Kuh et al., 2008), also plays an important role in influencing student persistence. This benchmark encompasses a range of diversity experiences, including exposure to diverse ideas, settings, and people from a diversity of backgrounds, including racial, religious, political, cultural or economic backgrounds. But, in the current study, the focus was specifically on experiences with a diversity of people

as indexed by students' participation in serious discussions and becoming acquainted with peers of different ages, races, or religious, political or economic backgrounds.

Research has shown that contact with a more diverse group of friends has a number of positive effects on student engagement and persistence. For example, Chang et al. (2006) found many benefits of increased cross-racial interaction between students, including enhanced self-confidence, motivation, intellectual and civic development, educational aspirations, cultural awareness, and commitment to racial equity (Antonio, 2001, Antonio, 2004; Chang 1999; Chang, 2001; Chang, Astin, & Kim, 2004). Within the student engagement framework, experiences with diversity would be predicted to increase student integration and engagement, which would in turn promote positive student outcomes.

Research suggests that the impact of diversity experiences on student outcomes, however, may vary for students of different backgrounds. Current research on minority student persistence reveals that, if students' experiences with diversity are negative, or perceived as discriminatory, diversity experience may actually have a negative effect on minority students' sense of belonging (or, in Tinto's model, the 'social integration'). For instance, work by Hurtado and Ponjuan (2005) found that perceptions of racial hostility on campus had a negative effect on Latino students' sense of belonging at their university, which was then related to lower persistence in this group (Hurtado & Ponjuan, 2005;.Hurtado & Carter, 1997).

4. Active and Collaborative Learning Benchmark of Student Engagement

The Active and Collaborative Learning Benchmark of student engagement is

indexed by active learning behaviors, like asking questions in class, making class presentations, applying course material outside of class, discussing course ideas with classmates, and tutoring or teaching other students (Kuh et al., 2008). Active and Collaborative Learning has been found to influence student persistence. A study of students in an introduction to psychology course indicated that active learning behaviors and study skills, the utilization of study guides, textbooks, and attendance to lecture, were all reliably related to later degree attainment, even controlling for college admission exam scores (Svanum & Bigatti, 2009; Credé & Kuncel, 2008) In addition, they found that these factors explain a large amount of the variance in academic performance overall. This study also suggests that the development of active learning skills, like time management and note taking, are learned skills, and are independent of student ability measures. This makes the acquisition of active learning skills a potential area of intervention.

5. Level of Academic Challenge Benchmark of Student Engagement

Research on the Level of Academic Challenge domain of student engagement has found that the challenge demands of an institution predict student persistence (Laird, Chen & Kuh, 2008). Laird et al. (2008) found that the level of academic challenge, as perceived by first-year students, was higher at institutions with above average rates of persistence (Laird et al., 2008). At these high-persistence institutions, “students report doing more academic work and their courses emphasize more complex levels of thinking” (Laird et al., 2008, p. 91).

With these findings, it is impossible to make any causal inferences, but other studies indicate that the more time students need to spend studying for a course, the better

students' performance (Nonis & Hudson, 2006). Additionally, contrary to popular belief, first-year students taking a greater course load earn higher GPAs and have greater retention outcomes than peers with a lighter course load, even controlling for baseline student ability and prior academic record (Szafran, 2001). Students who registered for highly *difficult* courses in the first year, however, experienced worse GPA and retention outcomes (Szafran, 2001). It may be that, with regards to the Level of Academic Challenge benchmark of student engagement, the amount of time spent on academic work in the first year, rather than the difficulty of that work, is positively related to student outcomes.

F. Current Study

The current study was conceptualized based on the interactionist framework, taking into account both institutional factors and individual student factors. In the current context, the aim was to identify predictors of student outcomes, focusing specifically on the institutional characteristic of student engagement and the individual background characteristics of level of parent education, ACT score, high school percentile rank, gross financial need, and racial demographic. In addition, given the disproportionate rates and patterns of college completion among different racial groups, this study also aimed to determine if the relationship between student engagement domains, student background, and student outcomes differed between racial groups.

The current study addressed several gaps in this literature. There is very little research assessing the individual predictive validity of the proposed NSSE benchmarks of student engagement. The current study used scales from a different survey (CSEQ) to investigate how each of the five benchmarks of student engagement influenced a wide

array of student outcomes longitudinally. The differential effects of these benchmarks on student outcomes have also not been systematically examined across diverse groups of students. This study examined racial differences in the relationship between the student engagement benchmarks and student outcomes within the same university setting.

1. **Hypotheses**

The literature on college success is vast and complex, as illustrated in the current review. Low rates of college completion, wherein only one of two enrolling freshmen will earn a college degree, call for attention to this issue of college dropout. And while college completion does not guarantee success for all graduates, the literature demonstrates the superior outcomes of college graduates compared to counterparts. Positive benefits have been found for everything, for example, from psychological well-being, to employment opportunities to financial health. Theoretically supported frameworks that consider both student and college environment interactively allowed for the proposal of various hypotheses:

1. The literature casts student engagement as a powerful force in the positive outcomes of college students. Even when unpacked into several nuanced domains, the literature indicates that student engagement had a positive impact on student outcomes. Thus, one of the study research questions was to identify the predictive value of the five student engagement benchmarks in college completion, retention, and academic performance outcomes, student characteristics notwithstanding. Specifically, five positive main effects of each of the student engagement benchmarks were hypothesized for each dependent variable of 1. four-year graduation status, 2. six-year graduation status, 3. retention to second year and 4. first-year GPA.

2. The literature indicates that the effects of student engagement are not uniformly or unconditionally positive, and may vary systematically by student racial background. For example, the literature revealed that African American students differed from other student groups as to which type of interaction with faculty was most beneficial. For these students, research-related rather than course-related contact was most beneficial, but course-related faculty interaction was most common. With regard to the Supportive Campus Environment, minority students reported experiencing less positive relationships with peers, teaching assistants, staff and faculty on campus. These students reported that these relationships were often characterized by overt or covert racial stereotyping. In a similar vein, the Diversity Experiences benchmark of student engagement was found to be positively predictive of student outcomes, but only when this contact was enriching rather than conflictive.

The literature reviewed above indicated that, when diversity experiences led to perceived discrimination or racial conflict, minority students understandably reported a diminished sense of belonging. With regards to the Active and Collaborative Learning and the Level of Academic Challenge benchmarks, the literature revealed more uniformly positive effects on student outcomes. Active course learning habits and study skills positively influenced student outcomes, and the evidence indicated that the influence of these skills did not vary by racial demographic. With regards to the Level of Academic Challenge, there was no specific literature to suggest any racial group variation on the influence of course load, and time spent studying on student outcomes.

In light of the findings above, interaction effects between racial group and student engagement were expected to be seen in the Student-Faculty Interaction, Supportive

Campus Environment, and Diversity Experience benchmarks but not on the academically-oriented benchmarks of student engagement, that is, Active and Collaborative Learning and Level of Course Challenge. Specifically, it was expected that for students of minority status on campus, African American, Latino and Asian/Pacific Island students, would exhibit a significantly less positive relationship between the three benchmarks listed above, and each of the student outcomes. It was expected that the Active and Collaborative Learning and Level of Course Challenge benchmarks would have a uniformly positive influence on student outcomes across all racial demographics.

II. METHODS

The current study focused on predicting college students' longitudinal graduation outcomes at both four and six years after starting college, as well as retention to the second year, and first-year GPA, using student background characteristics and student engagement benchmarks as predictors.

A. Participants

Participants were four different cohorts of 200 randomly selected college freshmen who were surveyed after having completed their first semester of college, in 2004, 2006, 2008, and 2010, for a total of 677 students after sample cleaning. The final sample was 64% female and 36% male. In terms of racial demographic, 40% of the participants identified themselves as White, 24% as Asian/Pacific Islander, 21% as Latino/a, 10% as African American, and 4% identified themselves as Other. All of the students in the sample indicated that they started school at this university. In terms of age, 95% of the sample reported that they were 19 years old, or younger, with the remaining 5% reporting an age of 23 years or younger. In terms of employment, 83% of the sample reported having no job on campus for pay, and 58% reported having no job off campus for pay. Of those that reported having an on or off campus job, less than 5% worked more than 30 hours a week, with the majority working between 1 hour and 20 hours a week.

B. Procedure

The data for the current study were pre-collected via the College Student Experiences Questionnaire. The Questionnaire is administered every two years to freshmen and seniors by the participating institution. In the current study, only freshmen data were used. At the original time of data collection, students received a survey

electronically. An introductory email invited students to participate voluntarily in the survey, and all participants were entered into a drawing for campus gift certificates. Once data were collected, each survey was linked to students' academic records and demographic information via their school identification number assigned by the school and provided by the student.

C. Measures

The main measure for this study was the fourth edition of the College Student Experiences Questionnaire (CSEQ) developed by C. Robert Pace in the 1970s. The CSEQ was reorganized into a national institutional survey instrument in 1979, and again into its most current version in 1998 through the Indiana University Center for Postsecondary Research, Bloomington. This questionnaire contains 20 scales categorized into three different domains: Quality of Efforts, the College Environment, and College Gains:

- “The quality of effort undergraduate students invest in using educational resources and opportunities provided for their learning and development”;
- “The students’ perceptions of how much the campus environment emphasizes a diverse set of educational priorities”;
- “How the students’ efforts and perceptions relate to the personal estimates of progress made toward a holistic set of learning outcomes” (Kuh, Vesper, Connolly & Pace, 1997).

In this regard, the CSEQ corresponds with the NSSE (2007), in that many of the scales in the NSSE are derived from those in the CSEQ, and both questionnaires share many of the same developers. The survey also includes a demographics section, used to gather the

background characteristics used in the current study. For the purposes of this study, three of the Quality of Efforts scales, including Faculty Experiences [similar to NSSE's Student-Faculty Interaction], Student Acquaintances [similar to NSSE's Diversity Experiences] and Course learning [similar to NSSE's Active and Collaborative Learning], one of the College Environment scales [similar to NSSE's Supportive Campus Environment], and one of the Background Scales regarding the number of hours spent studying [similar to NSSE's Level of Academic Challenge] were used.

According to the CSEQ norms compiled by Indiana University, the skewness and kurtosis values for all of the scales are within the normal range (-0.8 to 0.8 and -0.7 to 0.7, respectively). Likewise, the overall Cronbach's alpha for each of the CSEQ scales is within an acceptable range of .7 and .92.

The current study used five of the CSEQ scales to represent the same five benchmarks proposed by the NSSE. The first scale, the Faculty Experiences scale, is made up of ten items ($\alpha = .88$). This scale assesses students' relationships with faculty members, and asks students to rate how often they interact with faculty in a variety of ways (on a scale of one to four wherein 1 = Never, 2 = Occasionally, 3 = Often, 4 = Very Often). It includes items like "How often have you talked with your instructor about information related to a course you were taking (grades, make-up work, assignments, etc.?)"; How often have you discussed your career plans and ambitions with a faculty member?"; How often have you socialized with a faculty member outside of class (had a snack or soft drink, etc.?)"

The second scale used in the current study, the Student Acquaintances scale, [representing Diversity of Experiences] is made up of 10 items ($\alpha = .91$). This scale

assesses the amount of contact that students have with others from diverse backgrounds (On a scale of one to four wherein 1 = Never, 2 = Occasionally, 3 = Often, 4 = Very Often). This includes items like: “How often have you become acquainted with students whose interests were different from yours; became acquainted with students whose race or ethnic background was different from yours?”; “How often have you had serious discussions with students whose political opinions were very different from yours?”)

The third scale used from the CSEQ, the Course Learning scale, is made up of 11 items ($\alpha = .83$). It assesses how often students interact and engage with course materials (On a scale of one to four wherein 1 = Never, 2 = Occasionally, 3 = Often, 4 = Very Often). This scale asked students: “How often have you applied material learned in a class to other areas (your job or internship, other courses, relationship with friends, family, co-workers, etc.); How often have you tried to see how different facts and ideas fit together?; How often have you contributed to class discussions?”

From the College Environments domain of the CSEQ, the College Environment scale was used to represent the Supportive Campus Environment benchmark. This scale is made up of three items ($\alpha = .70$). It assesses the quality of students’ campus relationships with faculty, peer, and staff) on a scale of one to seven. Specifically, students rate their relationships with peers from one to seven with one being “Competitive, Uninvolved, Sense of alienation” and seven being “Friendly, Supportive, Sense of Belonging”. Student were asked to rate their relationships with administrative personnel from one to seven, with one being “Rigid, Impersonal, Bound by regulations” and seven being “Helpful, Considerate, Flexible”. The third item asks students to rate their relationships with faculty members from one to seven with one being “Remote,

Discouraging, Unsympathetic” and seven being “Approachable, Helpful, Understanding, Encouraging.”

The final benchmark, Level of Academic Challenge, was represented by one item, from the demographic background section on the CSEQ. This item asked students to report how much time they spend studying outside of class. The question reads: “During the time school is in session, about how many hours a week do you usually spend outside of class on activities related to your academic program, such as studying, writing, reading, lab work, rehearsing, etc.?” Students chose a range of hours in increments of five, starting with five or fewer, and ending with more than 30 hours a week.

The current study also included several control variables, including a measure of parents’ educational attainment for each student. This information was derived from an item found in the background demographic items of the CSEQ. The item asked students “Did either of your parents graduate from college?” Student were given the following options: “No”, “Yes, both parents”, “Yes, father only”, “Yes, mother only”, “Don’t Know”. These responses were recoded, such that, if neither parent graduated from college, students were given a value of one. If either parent graduated from college, students were given a value of two, and if both parents graduated from college, students were given a value of three. This variable was then treated as a continuous predictor.

Students’ pre-college demographic characteristics, including ACT score, HSPR and financial status as measured by students’ gross financial need, as well as graduation, retention and GPA outcomes were all obtained from student university records. The students’ academic and demographic background data were linked to students’ survey responses using students’ identification numbers, which were voluntarily provided.

III. RESULTS

Only significant results are presented here.

A. Preliminary Analyses & Hypothesis Testing Procedures

Preliminary analyses were conducted to test for the violation of any assumptions of statistical tests. Skewness and Kurtosis values were examined for each variable distribution and no data transformations were deemed necessary. Correlational analyses were performed on all of the key continuous variables to test for multicollinearity issues. Correlations ranged from 0.00 to .60 (see Appendix B).

In addition, the five hypothesized main effects for the current study were tested using hierarchical logistic regression analyses on each of the three dichotomous outcomes (four-year graduation, six-year graduation, and retention to the second year). With regard to the remaining continuous outcome (first-year GPA), the same set of analyses was performed using hierarchical linear regression analyses. In each of the regressions, several blocks of student demographic variables were entered, followed by the benchmark variable of interest. Then, a final block of cross-product terms was added to each of the hierarchical logistic regressions, to examine whether the relationship varied by racial group. In total, 20 regressions were performed. Different sets of cohorts were used to test the effects on different outcomes. For example, the six-year graduation outcomes were tested using those cohorts that had been at the university long enough to have graduated within six years of their first year (2004 and 2006 cohorts). Likewise, the four-year graduation outcomes were tested with corresponding cohorts. GPA and retention to second year were tested using all cohorts of students.

1. Tests of Hypotheses

Overall, the results supported the first hypothesis. Each of the benchmarks uniquely predicted outcomes. In addition, significant interactions were found in the case of some benchmarks.

B. Student-Faculty Interaction

1. Four-Year Graduation

With respect to four-year graduation status, the results indicated that, for some groups more than others, Student-Faculty Interaction predicted students' four-year graduation outcomes, above and beyond student demographics. Table 2 presents the results of a hierarchical logistic regression testing the effects of Student-Faculty Interaction on four-year graduation status and how that relationship varies by race, after controlling for student demographics]. Specifically, there was a significant interaction effect between Student-Faculty Interaction and racial group on four-year graduation. For White students and Latino students, the odds of graduating increased by 78% for every unit increase in faculty contact. This is to say, on the four-point scale used to measure Student-Faculty Interaction, students who responded that they "Occasionally" interacted with Faculty had 78% greater odds of graduating in four-years than not graduating, compared to those who "Never" interacted with Faculty. As the scale increases, the odds increase incrementally in that way, such that someone who interacted "Often" with faculty had 78% increased odds of graduating than an individual who "Occasionally" interacted and 156% greater odds than someone who marked "Never". For African American and Asian American/Pacific Islander students, on the other hand, the pattern of the finding differed significantly from that of the other groups. Specifically, the impact of Student-Faculty Interaction on the odds of graduating in four years was significantly

diminished for African American and Asian/Pacific Islander students. Table 3 shows the individual odds ratios of the effect of Student-Faculty Interaction on four-year graduation odds for each racial category (see Table 3).

2. Six-Year Graduation

With respect to six-year graduation, analyses showed an effect only for African American students, specifically a negative one. Table 4 presents the effects of the level of Student-Faculty Interaction on students' odds of graduating in six years, holding pre-college characteristics constant, and Table 5 illustrates the specific graduation odds for each racial group (see Table 4 and Table 5). The observed effect indicated that, for this group, the odds of graduating in six years decreased as the degree of reported Student-Faculty Interaction increased.

C. Supportive Campus Environment

1. Four-Year Graduation

As predicted, with respect to four-year graduation for this benchmark, a positive effect was revealed, showing that for every unit increase in student-perceived Supportive Campus Environment, the odds of graduating for the overall group increased by 35%. Here, students were asked to rate their relationships on a one to seven scale with seven being the most positive. In this case, those who rated their relationships as a two of seven had a 35% in greater odds of graduating than not, compared to those who rated their relationships as a one of seven. A student who rated their relationships as a three of seven had 35% greater odds of graduating than an individual who marked "two" and 70% greater odds than an individual who marked "one". Contrary to hypotheses, however,

this relationship was equally positive across racial groups. Table 6 presents the effects of the Supportive Campus Environment benchmark, in predicting four-year graduation status.

D. Diversity Experiences

1. Four-Year Graduation

With regard to Diversity Experiences and the four-year graduation outcome, results indicated that there was a significant positive effect of (students' increased contact with diverse peers) on four-year graduation status for some groups but not others. For White and Latino students, for every unit increase on the Diversity Experience variable, which measured the, the odds of graduating in four years increased by 217%. This is to say, on the four-point scale used to measure Diversity Experiences, students who responded that they "Often" interacted with diverse peers odds of graduating in four-years than not were double the odds of those who "Occasionally" interacted with diverse peers, and quadruple the odds of those who "Never" interacted with diverse peers. Table 7 shows the effect of Diversity Experiences on four-year graduation outcomes. This effect was significantly diminished for African American and Asian/Pacific Island students, however—indicating that this benchmark was a positive predictor for Latino students and White students but not for African American or Asian/Pacific Island students. Table 8 represents the individual effect of increased Diversity Experiences on students' odds of graduating by racial category.

2. Retention to Second Year

Findings on the retention to second year variable revealed that, while Diversity Experiences had no significant impact on the retention of White, African American or

Latino students, it had a negative impact on Asian/Pacific Island student retention. For every unit increase in the amount of exposure to diverse peers on campus, Asian/Pacific Island students' odds of returning for a second year decreased by 52%. That is to say, Asian/Pacific Island students who indicated that they interacted with diverse peers "Very Often" had 52% lower odds of graduating than not, compared to student who interacted "Often" with diverse peers, and 104% lower odds of graduating than someone who interacted "Occasionally" with diverse peers. Table 10 illustrates the odds of retention for each individual racial group as a function of Diversity Experiences.

E. Active and Collaborative Learning

1. Four-Year Graduation

With regard to the Active and Collaborative Learning variable, four-year graduation findings revealed a positive effect. This finding indicated that for every unit increase in reported Active and Collaborative Learning, the odds of graduating in four years increased by 95% for the overall group. That is to say the odds of graduating versus not graduating for those who reported engaging in active learning behaviors "Very Often" were almost double the odds of an individual who engage in those behaviors "Often", and quadruple that of individuals who "Occasionally" engage in those behaviors. In support of both hypotheses, this finding did not differ by racial group. Table 11 presents the effect of Active and Collaborative Learning habits on odds of graduating in four years.

2. Six-Year Graduation

With respect to six-year graduation findings, a positive effect of Active and Collaborative Learning on six-year graduation status was found, indicating that, for

White students, for every unit increase on reported Active Learning, there was a 266% increase in the odds of graduating in six years. This means that students who report engaging in active learning behaviors “Very Often” were more than twice as likely to graduate compared to those who reported engaging in these behaviors “Often”, and more than four times as likely to graduate compared to those who “Occasionally” engaged in those behaviors. Table 12 shows the effects of Active and Collaborative Learning on six-year graduation status (see Table 12). This effect, however, was significantly diminished for Latino and African American students. In fact, for African American students, the effect of Active and Collaborative Learning on six-year graduation status was negative. This indicates that African American students who engage in more active learning habits are then less likely to graduate in six years. Table 13 shows the effect of Active and Collaborative Learning on six-year graduation status for each racial group.

3. First-Year GPA

With regard to first-year GPA, findings revealed a positive effect of Active and Collaborative Learning for White students, African American students and Asian/Pacific Island students, but no effect for Latino students. This finding indicated that for every unit increase on reported Active and Collaborative Learning habits, White, African American and Asian/Pacific Island students’ GPAs increased by 0.15 points. Table 14 illustrates this Active Learning effect on GPA. That is to say, those who engaged in active learning behaviors “Very Often” were predicted to have 0.15 higher GPAs than those who marked “Often” and 0.30 higher than those who marked “Frequently”.

F. Level of Academic Challenge

1. Four-Year Graduation

With regard to the Level of Academic Challenge, findings revealed that for the group as a whole, the number of hours spent studying was positively predictive of graduation in four years. For every unit increase in reported hours spent studying, there was a 31% increase in the likelihood of graduating in four years. Here, then, an individual who reports studying for “6-10 hours per week” had a 31% increase in the odds of graduating compared to those who studied “5 hours of fewer”. Table 15 shows the effect of the Level of Academic Challenge on four-year graduation status.

2. First-Year GPA

With regard to first-year GPA, findings revealed a positive impact of the Level of Academic Challenge for the overall group, indicating that, for every unit increase in reported hours spent studying, GPAs for the overall group at the end of the first year increased by 0.18 points. This indicates that an individual who reports studying “26-30 hours a week” is predicted to have 0.18 points higher GPA than someone who reported studying “21-25 hours a week” and 0.36 points higher than someone who reported “16-20 hours a week”. Table 16 illustrates the effect that the Level of Academic Challenge has on GPA.

IV. DISCUSSION

There are well-documented disparities between those with and without a college degree in both financial and employment outcomes. The literature reviewed above indicates that there is a tangible return on the investment in a college education, and tangible financial costs to leaving college without a degree. Given these returns, and the high cost of each year spent at an institution of higher education working towards a degree, university administrators are invested in increasing students' college completion rates. Findings from the current study offer direction on how to enhance these rates. Furthermore, the findings may be uniquely useful given that this study is based on a novel conceptualization of college completion that incorporates both individual and institutional factors.

From an individual standpoint, such factors as past academic performance, financial status, parent education, and standardized test scores have historically been cited as primary factors in explanations of college incompleteness. In the current study, however, many of these 'popular' variables were eliminated from the equation, rendering them inconsequential in explaining college incompleteness. This makes the current findings all the more noteworthy.

Even after accounting for the above individual factors, all the five student engagement benchmarks proved to be predictive of outcomes for the overall group. Thus, engaging students in campus life, whether by creating a supportive campus environment, increasing opportunities to engage with faculty, encouraging a critical diversity dialogue on campus, utilizing active and collaborative teaching tools, or by providing challenging course material, administrators influence graduation rates on campus. A more nuanced

look at the four-year graduation findings, however, highlights differential experiences across racial groups, with benchmarks actually working in a contradictory way for certain groups. For example, the greater interaction that African American and Asian/Pacific Island students had with faculty, the more that their graduation potential was compromised.

The current findings are consistent with the outcomes of classic studies on school persistence and success. The student-faculty interaction variable has held a historic place in college dropout research with positive effects found on student persistence, including for minority groups (Tinto, 1975, 1987; Spady, 1971; Pascarella & Terenzini, 1979). Pascarella and Terenzini (1980) also qualified this contact in terms of quality. These researchers linked both extent of student-faculty informal contact and quality of contact with such variables as students' educational aspirations, attitudes toward college, academic achievement, intellectual and personal development. Kim and Sax (2009) further refined this picture, showing that outcomes varied by *nature* of contact. Specifically, in the case of African American students, while research-related contact with faculty was a powerful predictor of school performance relative to other groups, course-related contact worked positively for all groups *except* African American students (Kim & Sax, 2009). This set of studies begs the need for research that examines student-faculty interaction in a dimensional way, including in terms of, at minimum, frequency, quality, and nature of contact.

Another outcome that echoes the complexity of student-faculty interaction findings was that African American and Asian/Pacific Island groups were no more advantaged by their exposure to diverse peers. This finding flies in the face of compelling

research that perceived campus racial climate was the most powerful positive predictor of institutional commitment for Asian, African American, Latina/o, and White students (Museus et al., 2008).

Interactions with faculty and diverse peers may not be uniformly positive for African American and Asian/Pacific Island groups, as suggested by Ancis et al.'s research (2000) at a diversely populated large mid-Atlantic University. African American students reported more racial conflict on campus, and less equitable treatment by faculty and staff than did other groups. In addition, both students who were identified as Asian American and those who were identified as African American, in comparison to White students, reported that the campus had less respect for different racial backgrounds (Ancis et al., 2000). The results of Ancis et al.'s work, and the findings of the current study, are particularly interesting given that these two groups, African American students and Asian/Pacific Island students, are often considered to be highly different in terms of academic experiences and outcomes, whereas African American and Latino students have tended to be seen as being more academically similar. The current study findings paint an entirely different picture of the college experiences for students of different racial backgrounds.

The campus racial climate literatures may offer a window through which to view the present study's finding of diminished graduation effects for African American and Asian/Pacific Island groups in terms of these variables. Even if the majority of interactions with others on campus is enriching and supportive, perceived inequitable treatment, as seen in Ancis et al.'s research, may understandably lead to less positive outcomes for the students who encounter it as compared to those who do not.

The Ancis et al. study (2000) also helps shed light on the quite different outcomes of Latino/a students, for whom the impact of student-faculty interaction and campus experiences with diversity on four-year graduation status was just as positive as for White students. In fact, experiences with diversity on campus were highly positively predictive of four-year graduation outcomes for Latino students and White students, such that every incremental increase on the diversity scale was associated with a 217% in those students' odds of graduating. Why did these two groups see this strong positive boost in response to diversity, while African American students and Asian/ Pacific Island students showed positive but significantly diminished effects of diversity, by comparison? Ancis et al. illustrated that while African American students, Asian American students and Latino/a students all reported feeling more pressure to minimize overt racial-ethnic group characteristics in order to be accepted, Latino/a students reported this phenomenon to a significantly lesser degree.

There are a few possible explanations for the difference in perceptions of campus interactions and diversity by group. One explanation has to do with group image and stereotypes. There is research that suggests that students' perceptions of themselves and their abilities are in some part tied to the nature of the common group stereotypes that they encounter (Kao, 2000). Qualitative work with high school students reveals that students who identified as African American and as Asian American view their own group stereotypes as being strongly linked to academic expectations. African American students reported feeling that they are expected to perform poorly and Asian American students reported feeling that they are expected to perform very well (Kao, 2000). In contrast, Latino students reported that they viewed their own group stereotypes as

relating to later expected occupation, rather than academic performance (Kao, 2000). In light of these findings, perhaps African American and Asian/Pacific Island students are more attuned to racial tensions or differential treatment in the academic setting than are Latino students. Likewise, perhaps stereotypes about African Americans and Asian/Pacific Island are more salient in the minds of faculty than stereotypes for Latinos.

At minimum, student-faculty interaction and diversity experience findings with regard to four-year graduation suggest that the dynamics of the minority student's college experience is more complex than what has been offered by this literature thus far. Additionally, the strong effect of the Diversity Experiences benchmark for White and Latino students suggests that a diversity-promotion intervention strategy may have tangible effects on the graduation trajectories for these groups.

Six-year graduation outcomes revealed a different pattern of outcomes. Specifically, these findings showed that all of the engagement factors bear more influence on helping students graduate *on time*, but that only active learning behaviors (Active and Collaborative Learning), had an impact on whether students who are unable to graduate within four years will succeed in completing school within six-years. Active learning refers to the extent to which students ask questions in class, make class presentations, apply course material outside of class, discuss course ideas with classmates, and tutor or teach other students. In fact, Active and Collaborative Learning was found to be a highly influential predictor of White students' six-year graduation status. As White students' reported greater active and collaborative learning strategies with course material, these students' odds of graduating in six years increased incrementally by 266%! This effect was diminished for Latino and African American

students, however. Certainly this benchmark is a strong candidate as a target for intervention for some groups of extending students. For instance, perhaps students entering their ninth semester of college, who have already surpassed the four-year graduation mark, could matriculate into a small upper-year seminar course that deliberately incorporates all of these active learning habits directly into the curriculum. This is just one example of a practical intervention that could reasonably apply current study findings.

Active learning practices were found to be an important predictor of all of the outcomes in the current study. In fact, this benchmark is the only one that predicts six-year graduation. One explanation is that after four years, many students in a given class have graduated, and extended students' friend circles have been severely reduced. This may mean that the social factors, like relationships on campus, hold less influence over six-year students making academic engagement particularly influential in students' graduation outcomes.

The effect of engaged learning (Active and Collaborative Learning) on sixth year graduation outcomes, while significant for the overall group, had a differential impact across races. In the case of Latino/a students, the effect of engaged learning on six-year graduation outcomes was significantly diminished, showing only little impact. The fact that this variable was the only differential outcome among all study variables for this group makes it noteworthy. For one, it suggests that in terms of the variables of focus in this study, relative to African American and Asian/Pacific Island groups, Latinos/as' experience is more consistent with that of Whites. Given the positive outcomes for this group, it behooves researchers to unpack Latinos/as' experience to learn what particular

variables contribute to their advantaged and protected status.

African American students were worse off with even a *negative* effect of engaged learning (Active and Collaborative Learning), indicating that the more engaged students are with course materials and classwork, the *less* likely they were to complete their degree in six years. Likewise, as discussed earlier and consistent with four-year graduation findings, African American students' greater interaction with faculty also predicted their lesser likelihood of graduating in six years. The fact that these negative student-faculty interaction findings hold beyond the four-year point into the sixth year highlights the significance of this variable as a factor in success for this group. Furthermore, it reinforces the historical and enduring significance of this variable in the student success literature.

Taken together, four- and six-year graduation findings are difficult to interpret. The generally unique distinction between the two warrants further examination. There is little research on the unique needs of this group of later graduates, whom the literature refers to as "extenders". One mixed-method study by Volkwein and Lorang (1996) found that six-year graduates were frequently taking lighter course loads. Almost half of the "extenders" took less than 15 credit hours for more than four semesters of college (Volkwein & Lorang, 1996). These researchers revealed findings explaining that some students took lighter course loads in order to protect their GPAs. This type of "extender" would likely be highly engaged in coursework to maintain their high GPAs, but would take longer to graduate. But as observed in the current study, African American students' greater engagement and even faculty interaction actually hurt them. Thus, perhaps for African American students, this extension strategy is not effective, compromising their

ability to complete the degree even after extending.

While the five benchmarks were influential predictors of graduation outcomes, there was no impact of any of the benchmark variables on students' retention to the second year. This "non-finding" is consistent with the findings of many other studies, which have had similar difficulty accurately modeling student retention. Perhaps in the immediate transition from high school, students might be expectedly less integrated into the fabric of the university and thus function more independently in the first year.

There was, however, one notable interaction to report with regard to student retention. The engagement benchmark, Diversity Experiences, was negatively predictive of student retention, but only for Asian/Pacific Island students. This result is difficult to interpret, given that students' exposure to a diversity of peers and ideologies was positively predictive of Asian/Pacific Island students' long-term graduation outcomes (albeit a less positive predictor than for other racial groups). Perhaps the best explanation is that Asian/Pacific Island students have different needs in the first year than they do later in their education. It seems that for this group, there is some benefit to making friends of a similar background that is protective in the first-year transition, even though the literature suggests the opposite pattern in the long term.

Findings on the other shorter-term outcome, first-year GPA, point again to the importance of course engagement (Active and Collaborative Learning and Level of Course Challenge) in early college academic success for all groups but Latino students. The operative term in this statement is "early college success". As observed, the same engaged learning (Active and Collaborative Learning) proved a detriment to African Americans in the longer-term outcome.

A synthesis of second year retention and first-year GPA findings suggest one possible explanation for the respective outcomes. In larger universities and/or commuter schools, first-year students primarily take introductory courses with hundreds of other students in a given class. For many students, this circumstance limits their level of integration and belongingness on campus. In the long-run, however, classes become smaller and, for example, frequency of student-faculty contact increases, students' on campus support network expands, and they are exposed to more diverse peers. This may explain why these three benchmarks predicted the long-term outcome of four-year graduation as discussed below, but not shorter-term outcomes of GPA and student retention (Kuh, 2001). These three benchmarks then lose their power in predicting six-year outcomes, perhaps because many members of students' peer group have moved on, and belongingness becomes less influential than course engagement, which remains predictive.

In summary, the results of the current study indicate that it is students' academic engagement that is most important during the sprint, but in the marathon, both academic and social engagement on campus determine whether they cross the finish line in four years. In the case of students who extend their time in college to graduate in six years, it is again the academic engagement variables that have the greatest impact on students' completion, however in directionally different ways for participating groups. Academic engagement variables proved to be positively significant for one group, somewhat diminished for a minority group, and reversed in direction for members of other minority groups, depending on the outcome being studied. This points to the need for targeted interventions, and highlights some issues that may arise in taking a one-size-fits all

approach when it comes to developing programing and interventions on a college campus.

1. Implications

The models presented in this paper bring us one step closer to understanding how students with 18+ years of life experiences enter the university system, and interact with the campus environment to yield differential outcomes. In addition, current findings offer direction in understanding college completion and point to a specific set of institutional factors and show clear links to graduation outcomes for both on-time graduates and extenders. Differential group findings additionally point to an important line of future research, involving the investigation of the above-mentioned racial group differences on specific student engagement benchmarks, including Student-Faculty relationships, Diversity Experiences, and Active and Collaborative Learning on campus. Lastly, this study indicates that, when it comes to student engagement, not all outcomes are created equal. That is, student engagement demonstrated differential predictive value depending on which measure of student performance was used.

More research is needed to determine what manner of intervention best isolates and impacts these benchmarks of student engagement on campus. The present study's results imply, for instance, that greater exposure to diversity on campus may have tangible impacts on the long-term graduation outcomes of all students. These results also imply that Asian/Pacific Island students have a unique set of cultural needs in the first year of college that, at the very least, warrant further investigation. The present study also points to the importance of active learning and time spent studying course materials within the first year, for not only academic outcomes (like GPA) but also for long-term

graduation outcomes.

A major strength of this study is that it illustrates the great number of possibilities when individual background characteristics are *not* the explanatory focus of outcomes. While it is useful to know whether students' ACT scores or high school percentile rankings can predict students' outcomes from an admissions standpoint, these individual variables do little to inform us of the best ways to support students once they have arrived on campus. It is impossible for administrators to go backwards in time to retroactively influence a students' high school grades, nor can students do anything to remedy low ACT scores once they are enrolled in their first semester, and struggling. That information is no longer useful in helping us to help students once they cross the university gates. We may find it more productive, then, to focus our attention on the different ways that students experience campus life, and how those experiences predict students' outcomes. These experiences are more conducive to changing, and provide us with a more reasonable avenue for such change. Findings from the current study furthermore point to a specific set of institutional factors that show clear links to graduation outcomes for both on-time graduates and extenders.

From an administrative perspective, the current study uncovers new ways to use student survey data that is often collected by institutions to inform programming. These data also have the potential for affecting policy. Many universities nationwide already employ student engagement surveys like the CSEQ or the NSSE. These surveys are generally used descriptively to indicate how students' experiences on campus change as they progress. The current study reveals the significant *predictive* value that these surveys hold for university administrators and researchers alike.

In beginning to think about possible interventions, much work has emerged on a set of “high impact educational practices”, which have been associated with high levels of student engagement, and which have also been shown to be positively associated with student retention and success. These high-impact practices include: First-Year Seminars and Experiences, Common Intellectual Experiences (thematic coordinated general education programs), Learning Communities, Writing-Intensive Courses, Collaborative Assignments and Projects, Undergraduate Research, Diversity/Global Learning Courses, Service Learning Experiences, Internships, and Capstone Projects (Kuh, 2008). These practices are associated with high levels of student engagement on the various benchmarks discussed in this paper. These may represent one manner of influencing these student engagement benchmarks on college campuses, but there is certainly much work to be done to determine the best ways for university administrators, faculty, and staff support positive outcomes for *all* students on their campus.

2. **Limitations**

One limitation of the current study, and, in fact, of any study of the higher education system, is the inability to account for every possible variable that may influence student outcomes. In the current study, non-cognitive, motivational, or attitudinal measures were not available. Nor were any direct measures of students’ perceptions of the racial climate on campus. These are just some potential variables that might reasonably help contribute to a richer picture that explains these findings—particularly those few counterintuitive interactive relationships that we found among African American and Asian/Pacific Island groups.

It is important to note that the present study was conducted at a large, highly

diverse, urban public university. The diversity of this university is the very quality that allowed us to compare the experiences of a wide array of racial groups across the same campus context. These findings, however, may not generalize to universities with a less heterogeneous student body. The current study, however, points to the vast predictive potential of all of these engagement benchmarks on student outcomes from both practical and research perspective, which should at least be investigated at universities of other shapes and sizes.

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TABLES

Table 1

Descriptive Statistics of student sample for all cohorts, after outliers were removed

| | N | Range | Minimum | Maximum | Mean | Std. Deviation |
|--------------------|-----|---------|---------|---------|----------|-------------------|
| ACT | 670 | 1-36 | 16.00 | 35.00 | 23.64 | 3.48 |
| HSPR | 671 | 0-100 | 18.00 | 99.51 | 78.08 | 15.93 |
| First-Year GPA | 528 | 0-4.0 | 00.00 | 04.00 | 02.77 | 0.77 |
| Gross Need | 445 | 0-44873 | 00.00 | 44873 | 12737.77 | 8842.12 |
| Valid N (listwise) | 445 | | | | | |

Table 2

*Results of Hierarchical Logistic Regression for Student-Faculty Interaction
Predicting Four-Year Graduation Status Controlling for Student Background
Characteristics with Racial Demographic as a Moderator (n = 371)*

| | B | SE B | Exp(B) | 95% C.I. for Exp(B) | |
|-------------------|------|------|--------|---------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -.44 | .29 | .64 | .37 | 1.13 |
| Cohort '08 | -.93 | .33 | 39** | .21 | .75 |
| Parent Ed (cent) | .33 | .16 | 1.38* | 1.01 | 1.89 |
| ACT (cent) | .06 | .04 | 1.07 | .99 | 1.15 |
| HSPR (cent) | .02 | .01 | 1.02** | 1.01 | 1.04 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.45 | .45 | .64 | .26 | 1.54 |
| Asian/PI | -.26 | .31 | .77 | .42 | 1.41 |
| _Latino/a | -.21 | .34 | .81 | .42 | 1.60 |

-

| | | | | | |
|-------------------------------|-------|-----|-------|------|------|
| Faculty Interaction (cent) | .58 | .27 | 1.78* | 1.04 | 3.03 |
| AfAm x Faculty | -1.23 | .60 | 0.29* | | |
| Latino x Faculty | .16 | .53 | 1.18 | | |
| API x Faculty | -.95 | .46 | 0.39* | | |
| Constant | -.19 | .28 | .83 | | |

-2 Log Likelihood = 420.66 Nagelkerke R² = .15 $\chi^2 = 40.29^*$
Percent Correct = 71%

* $p < .05$, ** $p < .01$

Table 3

*Odds Ratios for Faculty Interaction by Racial Group Interactions
Predicting Four-Year Graduation Status*

| | Odds Ratio | 95% C.I. for Exp(B) | |
|--------|------------|---------------------|-------|
| | | Lower | Upper |
| White | 1.78 | 1.04 | 3.03 |
| AfAm | 0.52* | 0.18 | 1.49 |
| Latino | 2.09 | 0.83 | 5.22 |
| API | 0.69* | 0.33 | 1.43 |

* $p < .05$ significantly from White Student Referent Group

Table 4

*Results of Hierarchical Logistic Regression for Student-Faculty Interaction Predicting
Six-Year Graduation Status Controlling for Student Background Characteristics with
Racial Demographic as a Moderator (n = 252)*

| | B | SE B | Exp(B) | 95% C.I. for Exp(B) | |
|------------|------|------|--------|---------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -.35 | .30 | .70 | .39 | 1.26 |

| | | | | | |
|-------------------------------|-------|-----|-------|------|------|
| Parent Ed (cent) | .36 | .20 | 1.44 | .97 | 2.12 |
| ACT (cent) | .02 | .05 | 1.02 | .93 | 1.12 |
| HSPR (cent) | .01 | .01 | 1.01 | .10 | 1.02 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.93 | .53 | .39 | .14 | 1.11 |
| Asian/PI | -.49 | .38 | .61 | .29 | 1.28 |
| Latino/a | -.28 | .42 | .76 | .34 | 1.71 |
| Faculty Interaction (cent) | .77 | .42 | 2.16 | .95 | 4.91 |
| AfAm x Faculty | -1.89 | .67 | .15** | | |
| Latino x Faculty | -.52 | .67 | .59 | | |
| API x Faculty | -1.01 | .56 | .36 | | |
| Constant | 1.19 | .34 | 12.33 | | |

-2 Log Likelihood = 303.291 Nagelkerke $R^2 = .14$ $\chi^2 = 26.35^*$
Percent Correct = 69%

* $p < .05$, ** $p < .01$

Table 5

*Odds Ratios for Faculty Interaction on Six-Year Graduation
Status for each Racial Group*

| | <i>Odds Ratio</i> | 95% C.I. for Exp(B) | |
|--------|-------------------|---------------------|-------|
| | | Lower | Upper |
| White | 2.16 | 0.95 | 4.91 |
| AfAm | 0.33* | 0.11 | 0.97 |
| Latino | 1.28 | 0.46 | 6.17 |
| API | 0.79 | 0.37 | 1.67 |

* $p < .05$ significantly different from White Student Referent Group

Table 6

Results of Hierarchical Logistic Regression for Supportive Campus Environment Predicting Four-Year Graduation Status Controlling for Student Background Characteristics with Racial Demographic as a Moderator (n = 377)

| | <i>B</i> | <i>SE B</i> | <i>Exp(B)</i> | 95% C.I. for <i>Exp(B)</i> | |
|-----------------------------|----------|---------------------------------|---------------|----------------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -.52 | .29 | .60 | .34 | 1.04 |
| Cohort '08 | -.94 | .33 | .39** | .21 | .74 |
| Parent Ed (cent) | .26 | .16 | 1.30 | .96 | 1.75 |
| ACT (cent) | .04 | .04 | 1.04 | .97 | 1.12 |
| HSPR (cent) | .02 | .01 | 1.02** | 1.00 | 1.03 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.54 | .45 | .58 | .24 | 1.39 |
| Asian/PI | -.29 | .31 | .75 | .41 | 1.37 |
| Latino/a | -.35 | .34 | .71 | .36 | 1.38 |
| Supportive Campus (cent) | .30 | .15 | 1.35* | 1.00 | 1.82 |
| AfAm x Support | -.25 | .33 | .78 | | |
| Latino x Support | -.18 | .27 | .83 | | |
| API x Support | -.39 | .25 | .68 | | |
| Constant | -.11 | .28 | .89 | | |
| -2 Log Likelihood = 433.45 | | Nagelkerke R ² = .13 | | $\chi^2 = 36.701^*$ | |
| Percent Correct = 70% | | | | | |

* $p < .05$, ** $p < .01$

Table 7

Results of Hierarchical Logistic Regression for Diversity Experiences Predicting Four-Year Graduation Status Controlling for Student Background Characteristics with Racial Demographic as a Moderator (n = 369)

| | <i>B</i> | <i>SE B</i> | <i>Exp(B)</i> | 95% C.I. for <i>Exp(B)</i> | |
|----------------------------|----------|------------------------|---------------|----------------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -.62 | .29 | .54* | .30 | .95 |
| Cohort '08 | -1.03 | .33 | .36** | .19 | .69 |
| Parent Ed (cent) | .29 | .16 | 1.34 | .98 | 1.83 |
| ACT (cent) | .06 | .04 | 1.06 | .98 | 1.14 |
| HSPR (cent) | .03 | .01 | 1.03** | 1.01 | 1.04 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.35 | .45 | .70 | .29 | 1.70 |
| Asian/PI | -.25 | .31 | .78 | .42 | 1.45 |
| Latino/a | -.15 | .34 | .86 | .43 | 1.71 |
| Diversity (cent) | .77 | .27 | 2.16** | 1.25 | 3.75 |
| AfAm x Diversity | -1.24 | .60 | .29* | | |
| Latino x Diversity | -.11 | .53 | .90 | | |
| API x Diversity | -1.01 | .46 | .37* | | |
| Constant | -.14 | .28 | .87 | | |
| -2 Log Likelihood = 414.59 | | Nagelkerke $R^2 = .17$ | | $\chi^2 = 46.40^*$ | |
| Percent Correct = 71% | | | | | |

Table 8

*Odds Ratios for Diversity Experiences by Racial Group Interactions
Predicting Four-Year Graduation Status*

| | <i>Odds Ratio</i> | <i>95% C.I. for Exp(B)</i> | |
|--------|-------------------|----------------------------|-------|
| | | Lower | Upper |
| White | 2.16 | 1.25 | 3.75 |
| AfAm | 0.63* | 0.25 | 1.57 |
| Latino | 1.94 | 1.01 | 3.71 |
| API | 0.79* | 0.42 | 1.49 |

* $p < .05$ significantly different from White Student Referent Group

Table 9

*Results of Hierarchical Logistic Regression for Diversity Experiences Predicting
Retention to the Second Year, Controlling for Student Background Characteristics with
Racial Demographic as a Moderator (n = 510)*

| | <i>B</i> | <i>SE B</i> | <i>Exp(B)</i> | <i>95% C.I. for Exp(B)</i> | |
|-------------------|----------|-------------|---------------|----------------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -1.41 | .53 | .25** | .09 | .70 |
| Cohort '08 | -1.67 | .55 | .19** | .06 | .55 |
| Cohort '10 | -.49 | .61 | .62 | .19 | 2.03 |
| Parent Ed (cent) | .40 | .21 | 1.50 | .10 | 2.25 |
| ACT (cent) | -.02 | .04 | .98 | .90 | 1.06 |
| HSPR (cent) | .02 | .01 | 1.02* | .10 | 1.04 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.08 | .47 | .92 | .36 | 2.33 |
| Asian/PI | .18 | .41 | 1.20 | .54 | 2.65 |

| | | | | | |
|--------------------|-------|-----|---------|-----|------|
| Latino/a | .58 | .43 | 1.79 | .77 | 4.15 |
| Diversity (cent) | .57 | .33 | 1.76 | .92 | 3.39 |
| AfAm x Diversity | -.48 | .57 | .62 | | |
| Latino x Diversity | -.34 | .54 | .71 | | |
| API x Diversity | -1.31 | .55 | .27* | | |
| Constant | 1.04 | .52 | 20.87** | | |

-2 Log Likelihood = 331.33 Nagelkerke $R^2 = .11$ $\chi^2 = 29.99^*$
Percent Correct = 89%

* $p < .05$, ** $p < .01$

Table 10

Odds Ratios for Diversity on Retention to the Second Year for each Racial Group

| | Odds Ratio | 95% C.I. for Exp(B) | |
|--------|------------|---------------------|-------|
| | | Lower | Upper |
| White | 1.76 | 0.92 | 3.39 |
| AfAm | 1.10 | 0.44 | 2.74 |
| Latino | 1.25 | 0.55 | 2.89 |
| API | 0.48* | 0.21 | 1.11 |

* $p < .05$ significantly different from White Student Referent Group

Table 11

Results of Hierarchical Logistic Regression for Active and Collaborative Learning Predicting Four-Year Graduation Status Controlling for Student Background Characteristics with Racial Demographic as a Moderator (n = 370)

| Predictor | B | SE B | Exp(B) | 95% C.I. for Exp(B) | |
|----------------------------|------|---------------------------------|--------|---------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -.31 | .29 | .74 | .42 | 1.29 |
| Cohort '08 | -.71 | .33 | .49* | .26 | .93 |
| Parent Ed (cent) | .29 | .16 | 1.33 | .98 | 1.81 |
| ACT (cent) | .06 | .04 | 1.06 | .99 | 1.14 |
| HSPR (cent) | .02 | .01 | 1.02** | 1.01 | 1.04 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.41 | .45 | .67 | .27 | 1.60 |
| Asian/PI | -.27 | .32 | .77 | .41 | 1.43 |
| Latino/a | -.17 | .34 | .85 | .43 | 1.66 |
| Active Course Learn (cent) | .67 | .32 | 1.95* | 1.03 | 3.68 |
| AfAm x Active | -.64 | .80 | .53 | | |
| Latino x Active | -.68 | .62 | .51 | | |
| API x Active | -.80 | .56 | .45 | | |
| Constant | -.36 | .28 | .70 | | |
| -2 Log Likelihood = 427.83 | | Nagelkerke R ² = .11 | | $\chi^2 = 31.23^*$ | |
| Percent Correct = 70% | | | | | |

* $p < .05$, ** $p < .01$

Table 12

Results of Hierarchical Logistic Regression for Active and Collaborative Learning Predicting Six-Year Graduation Status Controlling for Student Background Characteristics with Racial Demographic as a Moderator (n = 253)

| | <i>B</i> | <i>SE B</i> | <i>Exp(B)</i> | <i>95% C.I. for Exp(B)</i> | |
|----------------------------|----------|------------------------|---------------|----------------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -.16 | .30 | .85 | .48 | 1.52 |
| Parent Ed (cent) | .34 | .19 | 1.40 | .96 | 2.03 |
| ACT (cent) | .02 | .04 | 1.02 | .93 | 1.12 |
| HSPR (cent) | .01 | .01 | 1.01 | .10 | 1.02 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.80 | .53 | .45 | .16 | 1.28 |
| Asian/PI | -.43 | .37 | .65 | .31 | 1.35 |
| Latino/a | -.30 | .41 | .74 | .33 | 1.65 |
| Active Course Learn (cent) | .98 | .41 | 2.66* | 1.19 | 5.89 |
| AfAm x Active | -2.89 | .95 | .06** | | |
| Latino x Active | -1.58 | .72 | .21* | | |
| API x Active | -1.04 | .62 | .35 | | |
| Constant | -1.01 | .32 | 2.75 | | |
| -2 Log Likelihood = 307.58 | | Nagelkerke $R^2 = .13$ | | $\chi^2 = 25.19^*$ | |
| Percent Correct = 66% | | | | | |

* $p < .05$, ** $p < .01$

Table 13

Odds Ratios for Active and Collaborative Learning on Six-Year Graduation Status for each Racial Group

| | Odds Ratio | 95% C.I. for Exp(B) | |
|--------|------------|---------------------|-------|
| | | Lower | Upper |
| White | 2.66 | 1.20 | 5.89 |
| AfAm | 0.15* | 0.03 | 0.81 |
| Latino | 0.55* | 0.17 | 1.77 |
| API | 0.94 | 0.37 | 2.39 |

* $p < .05$ significantly different from White Student Referent Group

Table 14

Results of Hierarchical Linear Regression for Active and Collaborative Learning Predicting First-Year GPA Controlling for Student Background Characteristics with Racial Demographic as a Moderator (n = 415)

| | Beta | SE B | t |
|-------------------|-------|------|-------|
| Cohort '08 | -.04 | .09 | -.75 |
| Cohort '10 | .10 | .09 | 1.90 |
| Parent Ed (cent) | .09 | .05 | 1.77 |
| ACT (cent) | .17** | .01 | 3.52 |
| HSGPA (cent) | .29** | .00 | 6.44 |
| Gross Need (cent) | .01 | .00 | .23 |
| African American | -.17* | .12 | -2.89 |
| Asian/PI | -.01 | .10 | -.24 |
| Latino/a | .03 | .10 | .06 |

| | | | |
|----------------------------|------|-----|-------|
| Active Course Learn (cent) | .15* | .11 | 2.11 |
| AfAm x Active | -.09 | .22 | -1.55 |
| Latino x Active | -.07 | .18 | -1.28 |
| API x Active | -.07 | .17 | 1.29 |
| Constant | | .12 | 22.89 |

Adjusted $R^2 = .20$; * $p < .05$, ** $p < .01$

Table 15

Results of Hierarchical Logistic Regression for Level of Academic Challenge Predicting Four-Year Graduation Status Controlling for Student Background Characteristics with Racial Demographic as a Moderator (n = 392)

| | B | SE B | Exp(B) | 95% C.I. for Exp(B) | |
|---------------------------|------|------|--------|---------------------|-------|
| | | | | Lower | Upper |
| Cohort '06 | -.27 | .28 | .76 | .44 | 1.31 |
| Cohort '08 | -.78 | .32 | .46* | .25 | .86 |
| Parent Ed (cent) | .27 | .15 | 1.31 | .97 | 1.77 |
| ACT (cent) | .05 | .04 | 1.05 | .98 | 1.12 |
| HSPR (cent) | .02 | .01 | 1.02* | 1.00 | 1.03 |
| Gross Need (cent) | .00 | .00 | 1.00 | 1.00 | 1.00 |
| African American | -.48 | .45 | .62 | .26 | 1.49 |
| Asian/PI | -.28 | .30 | .76 | .42 | 1.37 |
| Latino/a | -.19 | .34 | .83 | .43 | 1.60 |
| Academic Challenge (cent) | .27 | .12 | 1.31* | 1.04 | 1.65 |
| AfAm x Challenge | -.05 | .24 | .95 | | |

| | | | |
|----------------------------|---------------------------------|-----|--------------------|
| Latino x Challenge | -.18 | .20 | .84 |
| API x Challenge | -.08 | .19 | .93 |
| Constant | -.37 | .27 | .69 |
| <hr/> | | | |
| -2 Log Likelihood = 449.26 | Nagelkerke R ² = .12 | | $\chi^2 = 33.66^*$ |
| Percent Correct = 69% | | | |
| <hr/> | | | |

* $p < .05$, ** $p < .01$

Table 16
Results of Hierarchical Linear Regression for the Level of Academic Challenge Predicting First-Year GPA Controlling for Student Background Characteristics with Racial Demographic as a Moderator (n = 436)

| | <i>Beta</i> | <i>SE B</i> | <i>t</i> |
|---------------------------|-------------|-------------|----------|
| Cohort '08 | -.04** | .09 | -.69 |
| Cohort '10 | .09 | .09 | 1.72 |
| Parent Ed (cent) | .07 | .05 | 1.52 |
| ACT (cent) | .10** | .17 | 3.60 |
| HSGPA (cent) | .27** | .00 | 5.95 |
| Gross Need (cent) | .00 | .03 | .66 |
| African American | -.19* | .12 | -3.62 |
| Asian/PI | -.03 | .09 | -.60 |
| Latino/a | .02 | .10 | -.37 |
| Academic Challenge (cent) | .18* | .03 | 2.52 |
| AfAm x Challenge | -.02 | .06 | -.35 |

| | | | |
|--------------------|------|-----|-------|
| Latino x Challenge | -.07 | .06 | -1.34 |
| API x Challenge | -.03 | .06 | -.48 |
| Constant | | .12 | 23.31 |

Adjusted $R^2 = .18$; * $p < .05$, ** $p < .01$

APPENDIX A**Student-Faculty Interaction (Experiences with Faculty Scale, CSEQ):**

In your experience at this institution during the current school year, about how often have you done the following?

(1 = Never; 2 = Occasionally; 3 = Often; 4 = Very Often)

- Talked with your instructor about information related to a course you were taking (grades, make-up work, assignments, etc.).
- Discussed your academic program or course selection with a faculty member.
- Discussed ideas for a term paper or other class project with a faculty member.
- Worked harder as a result of feedback from an instructor.
- Socialized with a faculty member outside of class (had a snack or soft drink, etc.).
- Participated with other students in a discussion with one or more faculty members outside of class.
- Asked your instructor for comments and criticisms about your academic performance.
- Worked harder than you thought you could to meet an instructor's expectations and standards.
- Worked with a faculty member on a research project.

Supportive College Environment (Quality of Relationships, CSEQ):

The next three ratings refer to relations with people at this college. Again think of your own experience, please rate the quality of these relationship on each of the following seven-point rating scales.

- Relationships with other students
 - 1 = Competitive, Uninvolved, Sense of alienation;
 - 7 = Friendly, Supportive, Sense of belonging
- Relationships with administrative personnel and offices
 - 1 = Rigid, impersonal, bound by regulations
 - 7 = Helpful, Considerate, Flexible
- Relationships with faculty members
 - 1 = Remote, Discouraging, Unsympathetic
 - 7 = Approachable, Helpful, Understanding, Encouraging

Diversity Experiences (Student Acquaintances, CSEQ):

In your experience at this institution during the current school year, about how often have you done each of the following?

(1 = Never; 2 = Occasionally; 3 = Often; 4 = Very Often)

- Became acquainted with students whose interests were different from yours.
- Became acquainted with students whose family background (economic, social) was different from yours.
- Became acquainted with students whose age was difference from yours.

- Became acquainted with students whose race or ethnic background was different from yours.
- Became acquainted with students from another country.
- Had serious discussions with students whose philosophy of life or personal values were very different from yours.
- Had serious discussions with students whose political opinions were very different from yours.
- Had serious discussions with students whose religious beliefs were very different from yours.
- Had serious discussions with students whose race or ethnic background was very different from yours.
- Had serious discussions with students from a country different from yours.

Active and Collaborative Learning (Course Learning, CSEQ):

In your experience at this institution during the current school year, about how often have you done each of the following?

(1 = Never; 2 = Occasionally; 3 = Often; 4 = Very Often)

- Completed the assigned readings for class.
- Took detailed notes during class.
- Contributed to class discussions.
- Developed a role play, case study, or simulation for a class.
- Tried to see how different facts and ideas fit together.
- Summarized major points and information from your class notes or readings.
- Worked on a class assignment, project, or presentation with other students.

- Applied material learned in a class to other areas (your job or internship, other courses, relationships with friends, family, co-workers, etc.).
- Used information or experience from other areas of your life (job, internship, interactions with others) in class discussions or assignments.
- Tried to explain material from a course to someone else (another student, friend, co-worker, family member).
- Worked on a project where you had to integrate ideas from various sources.

Level of Course Challenge (Background Information, CSEQ):

During the time school is in session, about how many hours a week do you usually spend outside of class on activities related to your academic program, such as studying, writing, reading, lab work, rehearsing, etc.?

- 1 = 5 or fewer hours a week
- 2 = 6-10 hours a week
- 3 = 11-15 hours a week
- 4 = 16-20 hours a week
- 5 = 21-25 hours a week
- 6 = 26-30 hours a week

APPENDIX B

Pearson Correlations

| | Parent Ed | ACT | HSPR | Gross Need | Active and Collaborative Learning | Faculty Relationships | Diversity Experiences | Supportive Campus | Level of Academic Challenge | First-Year GPA |
|-----------------------------|--------------|--------|--------|---------------|---|--------------------------|--------------------------|----------------------|-----------------------------------|-------------------|
| Parent Ed | _____ | .24** | -.12** | -.18** | .02 | .03 | .10* | .03 | .05 | .13** |
| ACT | .24** | _____ | -.10* | -.20** | -.10* | -.20** | .02 | -.11* | -.06 | -.20** |
| HSPR | -.12** | -.10* | _____ | .12* | .02 | -.01 | -.06 | .06 | .09* | .17** |
| Gross Need | -.18** | -.20** | .12** | _____ | .12** | .13** | .09* | .14** | -.04 | -.15** |
| Active and Collaborative | .02 | -.09* | .02 | .12** | _____ | .60** | .52** | .30** | .26** | .00 |
| Faculty Relationships | .03 | -.20** | -.01 | .13** | .60** | _____ | .48** | .31** | .20** | -.11** |
| Diversity Experiences | .10* | .02 | -.06 | .09* | .52** | .48** | _____ | .23** | .16** | -.06 |

| | | | | | | | | | | |
|-----------------------|------|--------|-------|-------|--------|-------|-------|-------|-------|-------|
| Supportive Campus | -.03 | -.11** | .06 | .14** | .30** | .31** | .23** | _____ | .12** | -.05 |
| Academic Challenge | .05 | -.06 | .09* | -.04 | -.26** | .20** | .16** | .12** | _____ | .12** |
| First-Year GPA | .11* | .20** | .28** | -.02 | .11* | -.02 | -.01 | -.02 | .15** | _____ |

** $p < 0.01$ level.

* $p < 0.05$ level.

INSTITUTIONAL REVIEW BOARD APPROVAL #1

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Approval Notice

Initial Review – Expedited Review

February 28, 2013

Susan Farruggia, PhD

Psychology

601 S. Morgan Street, Suite 2714

M/C 103

Chicago, IL

Phone: (312) 413-9461 / Fax: (312) 413-5707

RE: Protocol # 2012-1118

“Analytic Modeling of Student Success Data”

Dear Dr. Farruggia:

Members of Institutional Review Board (IRB) #2 reviewed and approved your research protocol under expedited review procedures [45 CFR 46.110(b)(1)] on February 21, 2013. You may now begin your research.

Your research meets the requirements for review under expedited review procedures [45 CFR 46.110] Category: 5

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for non-research purposes (such as medical treatment or diagnosis).

Please note the following information about your approved research protocol:

Protocol Approval Period: February 21, 2013 - February 21, 2014

Approved Subject Enrollment #: 27,266 cases

Additional Determinations for Research Involving Minors: The Board determined that this research satisfies 45CFR46.404, research not involving greater than minimal risk.

Performance Site: UIC

Sponsor: None

Research Protocol:

- a . Analytic Modeling of Entering Student Data; Version 1; 12/12/2012

Recruitment Material:

- a . No recruitment materials will be used - secondary analysis of data collected from UIC databases with written support of Vice Chancellor for Academic Affairs and Provost, Vice Chancellor for Student Affairs, and University Registrar

Informed Consent:

- a . A waiver of consent/assent/parent permission has been granted for this secondary analysis collected from UIC databases with the written support of the Vice Chancellor for Academic Affairs and Provost, Vice Chancellor for Student Affairs, and University Registrar

| Receipt Date | Submission Type | Review Process | Review Date | Review Action |
|--------------|------------------|----------------|-------------|----------------|
| 12/14/2012 | Initial Review | Expedited | 01/02/2013 | Returned to PI |
| 02/14/2012 | Response from PI | Expedited | 02/21/2013 | Approved |

Please note the Review History of this submission:

Please remember to:

→ Use your **research protocol number** (2012-1118) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the enclosure,

"UIC Investigator Responsibilities, Protection of Human Research Subjects" (<http://tigger.uic.edu/depts/ovcr/research/protocolreview/irb/policies/0924.pdf>)

Please note that the UIC IRB has the right to ask further questions, seek additional information, or monitor the conduct of your research and the consent process.

Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact the OPRS office at (312) 996-1711 or me at (312) 996-2014. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Sandra Costello

Assistant Director, IRB # 2

Office for the Protection of

Research Subjects

Enclosure: **UIC Investigator Responsibilities, Protection of Human Research Subjects**

INSTITUTIONAL REVIEW BOARD APPROVAL #2

2009-0703, am1 Page of 2 March 9, 2012

Exemption Determination

Amendment to Research Protocol – Exempt Review

UIC Amendment # 1

March 9, 2012

Patricia Inman, Ph.D.

Vice Chancellor of Student Affairs

2180 SSB

Office of Degree Progress, M/C 158

Chicago, IL 60612

Phone: (312) 996-6305 / Fax: (312) 413-0037

RE: Protocol # 2009-0703

**“Continuing Analysis of the 2004 College Student Experience
Questionnaire - (formerly UIC Research Protocol #2003-0802)”**

Sponsor: None

Dear Dr. Inman:

The OPRS staff/members of Institutional Review Board (IRB) #2 have reviewed this amendment to your research, and have determined that your research protocol continues to meet the criteria for exemption as defined in the U. S. Department of Health and Human Services Regulations for the Protection of Human Subjects [(45 CFR 46.101(b)].

The specific exemption category under 45 CFR 46.101(b) is:

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

You may now implement the amendment in your research.

Please note the following information about your approved amendment:

Exemption Period: March 9, 2012 – March 8, 2015

Amendment Approval Date: March 9, 2012

Amendment:

Summary: UIC Amendment #1 dated February 21, 2012 and submitted to OPRS on March 1, 2012 is an investigator-initiated amendment adding the following key research personnel: Brittany Myers and Karina Reyes

You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects still have responsibilities for the ethical conduct of the research under state law and UIC policy. Please be aware of the following UIC policies and responsibilities for investigators:

1. Amendments You are responsible for reporting any amendments to your research protocol that may affect the determination of the exemption and may result in your research no longer being eligible for the exemption that has been granted.

2. Record Keeping You are responsible for maintaining a copy all research related records in a secure location in the event future verification is necessary, at a minimum these documents include: the research protocol, the claim of exemption application, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to subjects, or any other pertinent documents.

3. Final Report When you have completed work on your research protocol, you should submit a final report to the Office for Protection of Research Subjects (OPRS).

4. Information for Human Subjects UIC Policy requires investigators to provide information about the research protocol to subjects and to obtain their permission prior to their participating in the research. The information about the research protocol should be presented to subjects in writing or orally from a written script. When appropriate, the following information must be provided to all research subjects participating in exempt studies:
 - a. The researchers affiliation; UIC, JB VAMC or other institutions,
 - b. The purpose of the research,
 - c. The extent of the subject's involvement and an explanation of the procedures to be followed,
 - d. Whether the information being collected will be used for any purposes other than the proposed research,
 - e. A description of the procedures to protect the privacy of subjects and the confidentiality of the research information and data,

 - f. Description of any reasonable foreseeable risks,

 - g. Description of anticipated benefit,
 - h. A statement that participation is voluntary and subjects can refuse to participate or can stop at any time,

- i. A statement that the researcher is available to answer any questions that the subject may have and which includes the name and phone number of the investigator(s).
- j. A statement that the UIC IRB/OPRS or JB VAMC Patient Advocate Office is available if there are questions about subject's rights, which includes the appropriate phone numbers.

Please be sure to:

→Use your research protocol number (2009-0703) on any documents or correspondence with the IRB concerning your research protocol.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact me at (312) 355-2908 or the OPRS office at (312) 996-1711. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely

Charles W. Hoehne, B.S., C.I.P.P

Assistant Director, IRB # 2

Office for the Protection of Research
Subjects

cc: Barbara Henley, Vice Chancellor of Student Affairs, M/C 600

VITA

Brittany R. Myers

Curriculum Vitae

Phone: 216-315-5993

Bmyers6@uic.edu

RESEARCH OBJECTIVES

I am committed to a research career in clinical psychology, investigating adolescent and diversity issues in education. I am particularly interested in using data to inform school policy in order to better meet the specific needs of diverse student bodies. I consider myself to be a Clinical-Community Psychologist, which means that I view individual behavior as occurring within multiple contexts and systems. Current work focuses on the enhancement of student retention and graduation in higher education from an administrative policy perspective.

EDUCATION

MA/PhD University of Illinois at Chicago, Clinical Psychology
In Progress

Minored in Community and Prevention Research
Advisor: Dr. Karina Reyes

BA Northwestern University, Psychology and Spanish
June, 2011 Graduated Magna Cum Laude

HONORS AND AWARDS

| | |
|---|-------------|
| Peer-Nominated and Elected Council of Graduate Students Representative | (2013) |
| UIC Psychology Department Travel Award, \$300 | (2013) |
| UIC Graduate College Student Travel Award, \$200 | (2013) |
| Graduated Magna Cum Laude | (2011) |
| Awarded Departmental Honors in Psychology (Northwestern University) | (2011) |
| Dean's List (All Quarters) | (2007-2011) |

| | |
|--|-------------|
| Mary Lynn Gibbons Scholarship | (2009-2011) |
| J.G. Nolan Scholarship | (2009-2011) |
| Bette and Neison Harris Scholarship | (2008-2009) |
| U-Promise Scholarship | (2008-2009) |
| Cleveland Scholarship Programs Scholarship | (2007-2010) |
| National Merit Scholar (Commended Finalist) | (2007) |

RESEARCH EXPERIENCE

Project Coordinator with Dr. Karina Reyes,

University of Illinois at Chicago (2011-present)

Oversees the ongoing quantitative and qualitative projects in the lab and supervises two undergraduate research assistants in their lab work.

Quantitative Project:

A secondary data analysis examining which campus experiences may predict undergraduate student retention longitudinally, and how these effects may differ across racial and ethnic groups.

Qualitative Project:

A 25-year longitudinal study using interviews to examine factors associated with school success or dropout and adult outcomes for a group of predominantly Mexican-American urban adolescents.

Research Assistant with Dr. Michael J. Bailey,

Northwestern University Human Sexuality Lab (2008-2011)

Worked on multiple studies of human sexuality, collecting data on the physiological arousal patterns, movement patterns, and neurological arousal patterns in both men and women of various sexual orientations.

PRESENTATIONS

Myers, B. & Reyes, K. (2012, October). *An Ecologically-Minded Longitudinal Analysis of College Persistence in Diverse College Freshmen*. Poster presented at the annual meeting of the Midwest Eco Conference, Kalamazoo, MI.

Myers, B., Reyes, K., Farruggia, S. P., Bottoms, B. L. & Inman, P. (2013, May) *Engaged Students are Successful Students: Course Learning as a Predictor of Four-Year College Graduation*. Poster presented at the annual meeting of the Association for Psychological Science Conference, Washington, D.C.

Myers, B.R., Reyes, K., Farruggia, S. P., Bottoms, B. L., & Inman, P. (2013, November). Student engagement as a predictor of college student outcomes. In M. Manderino (Moderator), *Shifting norms in higher education research: Considering financial aid policy, student engagement, and high school quality as predictors of college student outcomes*. Symposium presented at the Annual Midwest ECO Conference in Community Psychology, Chicago, IL.

EMPLOYMENT

Office of the Vice Provost of Undergraduate Affairs

(2012-present)

Chicago, IL

Graduate Assistant. Responsible for aiding in student success initiatives being implemented through the Office of the Vice Provost for Undergraduate Affairs by planning meetings, conducting reviews of the student retention literature, in organizing and developing new policy initiatives.

Psychology Department, University of Illinois at Chicago

(2011-present)

Chicago, IL

Teaching assistant. Responsible for leading several discussion sections of 20 students. Responsible for going over course material

in psychology, grading papers, and helping with exam preparation.

Department of Spanish and Portuguese, Northwestern University

(2008- 2011)

Evanston, IL

Spanish Tutor. Responsible for assisting Northwestern University students with Spanish grammar and language.

University Hospitals, Ireland Cancer Center

(Summer, 2010)

Cleveland, OH

Summer internship in psychiatric department working with and observing a psychooncologist at Ireland Cancer Center.

Akron Children's' Hospital, Department of Psychiatry

(Summer, 2009)

Akron, OH

Summer pediatric research scholar working in the psychiatric intake response center (PIRC). Responsible for organizing and analyzing data to evaluate the efficiency of the program.