STUDENT INVOLVEMENT AND THE IMPACT ON ACADEMIC SUCCESS

by

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DEDICATION

I dedicate this to my big brother, Greg, who is not here to see the result, but who always supported me through all of my journeys. I love you and I miss you, brother.

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ABSTRACT

Universities have been trying to increase graduation rates for decades. Using Astin's student involvement theory (1984), which posits the more a student is involved at the university, the more likely students will be retained and graduate from the university. Much of the research over the past 20 years has been limited to study the impact of one form of involvement has on retention and graduation, while this study combines different forms of involvement and how they impact retention and graduation rates. This study occurs with a first-year cohort entering fall 2012 at a public four-year university in the Pacific Northwest. While considering students' entering characteristics, this study uses multiple analyses to explore how first semester student involvement (Greek life, Recreation center use, working on campus, etc.) affects first semester GPA, first-semester and first-year retention, and graduation rates. Overall findings show first semester GPA is still the best predictor of six-year graduation rates. The study also showed certain types of student involvement impacts first semester GPA. This impact led to the creation of a weighted Student Involvement Index in an attempt to predict six-year graduation rates. This new Student Involvement Index accurately predicted over 61% of the student outcomes based on student involvement during the first semester at the university.

Keywords: student involvement, student engagement, retention, graduation, persistence

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CHAPTER ONE: INTRODUCTION

The success of Higher Education institutions is frequently tied to graduation rates (Goenner & Snaith, 2003). The graduation rate of a university is affected by a number of factors incorporating both student and institutional inputs. Academic and social integration have been shown to be paramount for student retention, academic success, and persistence to graduation (Barbera, Berkshire, Boronat, & Kennedy, 2017). The six-year graduation rates among doctoral granting universities varies from 10% (Louisiana State University - Eunice) to 97.8% (Yale University) (Salingo, 2013). Students who share the same individual characteristics (age, race, grades, standardized test scores, etc.) yet attend two different institutions will likely have a differing probability of completing their degree (Astin, 1993; Pascarella &Terenzini, 1991; Tinto, 1993). Institutional input variables influencing this outcome include factors such as class size, the academic performance of incoming high school students (class rank, test scores, GPA), the percentage of students from out of state, and the percentage of faculty holding a Ph.D. (Astin, 1993).

One focal point for many researchers, educational leaders, and universities is the retention of first year students at the institution. According to a National Student Clearinghouse (2014) report, 58.2% of Fall 2012 first-time freshman returned to the same institution for Fall 2013. Additionally, only 68.7% of the population returned to college at any U.S. institution for Fall 2013. While many studies demonstrate the influence of first-year college academic performance, as based on grade point average (GPA) as an

indicator of persistence (Gifford, Briceno-Perriott, & Mianzo, 2006, Reason, 2003; Pascarella and Terenzini, 2005; McGrath and Braunstein, 1997; Adelman, 1998), other researchers use Astin's (1985, 1993, 1999) student involvement theory as a foundation to build a research base. Astin's (1985, 1993, 1999) theory suggests that while GPA is an important factor for persistence, the sense of belonging and connection a student feels to an institution (through their campus involvement) is just as important. Students who feel a greater sense of belonging are more likely to persist than are their peers (Astin, 1999). The National Study of Student Engagement (NSSE) has identified six high-impact practices which affect student involvement and lead to greater academic and personal success (Kuh, 2001). These practices require students to dedicate significant time and effort, but, in return, provide opportunities to interact with faculty and staff, facilitate diverse interactions, and deliver feedback to students (Kuh, 2008). They include the following: learning communities; service-learning courses; research with faculty; experiential learning projects; global learning opportunities; and senior capstone seminars. Scholars and practitioners acknowledge that increasing engagement in high-impact practices increases student achievement and academic outcomes (Astin, 1993; Hausmann, Ye, Schoelfield, & Woods, 2009, Kilgo, Sheets, & Pascarella, 2015; Kuh, 2008).

The purpose of this study is to evaluate whether there is a relationship between first-year academic performance and first-year student involvement, based on Astin's (1985) student involvement theory. This study will also examine the relationship between students' GPA and levels of involvement, with their likelihood of graduation.

This study will also assess what contributors are significantly related to predicting academic success (GPA), retention, and/or graduation.

CHAPTER TWO: LITERATURE REVIEW

Conceptual Framework: Student Involvement Theory

In his theory of student involvement, Alexander Astin combines 20 years of research to provide a developmental theory of student success based on student involvement. Astin's theory suggests the more that a student is involved in an institution, the more success the student will have at the institution. Astin defines student involvement as the “amount of physical and psychological energy that a student devotes to the academic experience.” (1999, p. 518) This energy includes, but is not limited to, engagement in groups, athletics, time spent on campus, interaction with faculty, and/or time spent on studies.

Astin's (1999) student involvement theory is a connection of three different pedagogical ideas. The first, content theory, suggests that students learn passively from lectures, reading, assignments, and library research. This assumes the "ignorant" student learns from the "knowledgeable" professor. The second, resource theory, claims that the collection of resources (e.g., well-trained faculty, laboratories, libraries, high-end facilities, technologies, counselors, support personnel, etc.) brought together in one place will promote student learning. This theory led universities to focus on the collection of resources that are finite. The third theory, individualized (eclectic) theory, assumes that education should be individualized to the specific student and there is no "one fits all" model. While this model has personalized the curriculum, learning, and development of

each student, it is limited due to the considerable cost of individualizing the learning process for each student.

Astin states that involvement is connected to not just the physical presence of students, but rather the behavior of students. While Astin does not discount motivation or feelings as being important, he believes what an individual does or how he or she behaves defines involvement (Astin, 1999). This leads to five postulates to define student involvement on campus, including: 1) the investment of physical and psychological energy on either a generalized or specific subject; 2) involvement occurring on a continuum; 3) involvement as having both quantitative and qualitative features; 4) student learning and personal development associated with an educational program is directly proportional to the quality and quantity of student involvement in that program; and 5) the effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement. The last two components are subject to empirical proof and should be used to research the effectiveness (or lack thereof) of student involvement (Astin, 1999).

Through his 20 years of study of more than 200,000 students, Astin (1999) found that students who live on campus have greater levels of involvement. Astin also found that students who were involved in campus activities such as honors programs, athletics, social fraternities, student government, academic research, Reserve Officer Training Corps (ROTC) programs, and on-campus part time jobs were less likely to drop out. This led to the belief that an increase in time spent on campus and an increase in contact with other students and faculty led to a greater sense of belonging. Participation in campus extracurricular and co-curricular activities also allowed for a psychological attachment to

the college. Astin suggested that this attachment might help students try harder academically, which might lead to a more successful student.

According to Astin's (1993) theory of student involvement, change or growth in a student should be measured by comparing outcome characteristics with input characteristics. Experiences that cause change among students in different environments throughout college are assessed in his theory. The purpose of this assessment is to understand the impact that these experiences have on a student and his or her development. The impact differs from student to student depending on the input or experiences that students have prior to attending college, such as: self-prediction of success in college; courses taken in high school; preliminary choice of career; reasons to attend college; religious preference; and parental occupation, income, and education (Astin, 1993).

According to Astin, (1993) there are 192 constructs that can describe the institutional environment, including the following categories: institutional characteristics; peer group characteristics; faculty characteristics; curriculum; financial aid; choice of major; place of residence; and student involvement, which includes classes, hours studying, honors programs, sports, and social interactions. There are many ways to examine student involvement, such as including academic involvement, involvement with faculty, involvement with student peers, involvement with work, and other forms of involvement that includes volunteer work, religious services, alcohol consumption, and counseling.

It is important to describe the measurement of each construct, and how the relationship between involvement and outcomes affect the way each is measured. When

conducting research on the impact of student development on student success, it is important to determine whether there are relevant outcomes based on the experience. Second, it is important to determine how programs or experiences vary from college to college. The impact that experiences have on a student can vary based on a number of variables such as degree of exposure, time of exposure, intensity or frequency of interaction, maturation, and social change (Astin, 1993).

In general, higher levels of engagement in activities not only contributes to higher GPAs but also higher levels of satisfaction with one's academic experience (Turner, 2012; Webber, Krylow, & Zhang, 2013). Academic involvement, involvement with faculty, and involvement with peers are positively associated with academic performance, learning, and retention (Astin, 1993). Overall, academic (intellectual) development is proportional to the amount of time that students study, while growth in a particular area of knowledge is based on the number of courses taken in a particular area (Astin, 1993). Cognitive growth is negatively affected by forms of involvement that isolate students from peers or remove students from campus, such as watching television, living off-campus, working full time, or working off campus. Understanding how student involvement impacts academic performance can lead to higher graduation rates.

Grade Point Average

First year grade point average (GPA) has been explored in research going back to the 1950s (Jones and Case, 1955), where it was used to determine whether the Scholastic Aptitude Test (SAT) was a significant predictor of college success. First year GPA is often used as an indicator of subsequent success, because of the similarity of course work that institutions require during a students' first year of study (Burton and Ramist, 2001).

The comparability of course content and grading standards in first year courses are similar across colleges and universities. This similarity provides a common classroom experience while allowing for the comparison of unique institutional characteristics and programs across universities. Specifically, this includes the campus environment and culture across institutions and allowing for the study of culture and practices on college campus, efficacy of program and policies, and reasons why a high number of students transfer to other institutions or drop out after their first year (Zwick & Sklar, 2005).

According to Gayles' 2012 study, first year GPA was a significant indicator of 6-year graduation rate among students from diverse backgrounds. Gayles studied 8,743 students who entered college in the fall semester without previously earning college credits. He then compared their first year GPA to their final GPA at the 6-year graduation time. His study found that first year GPA was a significant indicator across diverse racial groups to use to predict 6-year graduation rates.

Stewart, Lim, and Kim (2015) explored the persistence (retention) of first year students entering a large, public university. Their sample consisted of 3,213 students who were enrolled from Fall 2006 through Fall 2008. High school GPA and first semester college GPA accounted for 26% of the variance in persistence (Stewart, et al., 2015). Interestingly, a higher GPA in high school decreased the probability that students would remain at the institution beyond the first year, whereas having a higher first-semester college GPA was linked to higher persistence (Stewart, et al., 2015). Yet, it is important to take into consideration other research. DesJardins, Ahlburg, and McCall (1999) found that a student's college GPA may have a very strong influence on dropout

behavior early in a student's career, but this effect may become less pronounced over time.

In 2002, Ishitani and DesJardins examined factors associated with graduation for 3,450 students who began studying at public and private U.S. institutions from Fall 1989 through Spring 1994. The sample included 51% female students, and 84.2% white students. A key predictor of persistence and graduation was first-year GPA. The study showed the higher the student's first year GPA, the lower the attrition rate. However, rather than use GPA as a continuous variable, students were broken into ordinal groups to compare non-linear relationships. Using students who earned a GPA of 3.0-4.0 as a comparison group, researchers found that students in the 2.0-3.99 GPA group were 30% more likely to drop out than their peers, students in the 1.0-1.99 GPA group were 97% more likely to drop out, and students in the 0.00-.99 GPA group were 360% more likely to drop out after their first year (Ishitani & DesJardins, 2002). While there were still many students who dropped out during year two (the odds of dropout were 1.5 times higher for students with a 1.0-1.99 GPA compared to students with a 3.0+ GPA), the lingering effects of a poor first semester GPA waned over time (Ishitani & DesJardins, 2002).

Not every study has shown a significant relationship between GPA and persistence, which leads researchers to consider other indicators of persistence. One study found a nonlinear relationship between grades and persistence: in an analysis of the 1987 National Postsecondary Student Aid Survey, students with low grades (C average or below), as well as those with high grades (A average), were consistently more likely to persist than those with B average grades (St. John, Paulson, & Carter, 2005). In other

words, the relationship between college achievement, grades, and persistence is not linear: while such a relationship could be an outlier in the research, it also might call for other factors to be considered when it comes to persistence.

Student Attrition and Retention

Attrition and retention rates have always been an important factor for gauging student success on college campuses. Attrition refers to leaving the university while retention refers to students returning to the university the following term. Attrition is not always due to financial troubles or "flunking out," but rather can be due to factors such as academic boredom, not being prepared for collegiate academics, difficulty in transitioning to the institution, incompatibility, a sense of not belonging, and unrealistic expectations of college (Levitz and Noel, 1989, p.67). The study suggests universities that facilitate a connection to freshmen can reduce the amount of attrition that takes place at the institution. Furthermore, Levitz and Noel (1989) state that the goals of these programs should be to connect students to the surrounding environment, help with the transition to college, and help students work towards their career goals while succeeding in the classroom.

Tinto's seminal study (1993) argued that students were more likely to persist to the following semester when they learned more. Specifically, Tinto believed the way students interacted with campus environments affected their integration within a college environment. This integration positively influenced behaviors in regard to retention. Students who failed to integrate to their new community would struggle to feel included in their environment. This would lead to their attrition from the university.

While participation in campus activities is believed to aid in student integration and success, lack of involvement leads to lower persistence rates. Dropping out can be considered as the ultimate form of noninvolvement and lack of integration (Tinto, 1993). According to Astin (1985), while the main reason students dropped out was boredom with classes, other factors contributing to dropout also reflect a lack of involvement, such as neglecting coursework, not participating in extracurricular activities, and having little contact with faculty. Interestingly, working full-time off campus also contributes to a lack of involvement, as time and energy is not devoted to academics or soft skill development (Astin, 1999; Pike, Kuh, & Massa-McKinley, 2009; Kulm and Cramer, 2006).

Churchill and Iwai's (1981) seminal study on student use of campus facilities (recreational facilities, housing facilities, and dining facilities) and college attrition included 605 students who withdrew from university between the first and second semester, in addition to 1,231 persisters, students who returned between the first and second semester. Due to the large number of students in each category, the withdrawer group was broken into three groups, labeled "dropouts," or students who were dismissed for insufficient grades; "low stopouts," or student who left voluntarily with a GPA below the midpoint between a 4.0 and the lowest GPA allowed (2.8 for freshman); and "high stopouts," or students who left with a GPA equal or higher than the midpoint between a 4.0 and the cut off GPA (Churchill & Iwai, 1981, p. 356). The persister group was divided into GPA groups using the same criteria as the low stopouts and the high stopouts. Students were surveyed on whether they were satisfied with the school, their usage of the housing, dining, and recreation facilities on campus, emotional well-being,

(i.e. homesickness, poor health) and how well the students felt they fit into the institution. The “dropouts” used the facilities on campus significantly less than the “persisters.” The “low persisters” used the facilities significantly more than the “low dropouts,” but the difference between “high stopouts” and “high persisters,” between “low persisters” and “high persisters,” and between “low stopouts” and “high stopouts” were not significant (Churchill & Iwai, 1981).

Churchill and Iwai’s study suggests that there is a relationship between students engaging in campus and being persistent in their studies. Because the students who were “low stopouts” used the facilities significantly more than the students who were “dropouts,” but less than the “low persisters,” this might suggest that one of two things could be true: campus facilities help with persistence, or for some reason the “low persisters” just use the facilities more than students who leave school. Either way, this study supports the use of campus facilities as an indicator of student engagement on campus.

Students from Diverse Racial/Ethnic Backgrounds

According to a 1999 study on the effects of liberal arts colleges, Astin states that attending Historically Black Colleges (HBCs) has positive effects on African-American students' GPAs, intellectual development, self-esteem, satisfaction with college, and other forms of involvement. While it is difficult to determine whether students at HBCs are performing at a higher level relative to other colleges, Astin asserts that HBCs show a positive effect on student retention due to small class sizes, residential programs, peer group support, and faculty that emphasize diversity and are heavily involved in administrative work (advising).

Flowers' (2004) study of almost 8,000 African American students from almost 200 public and private institutions over a ten-year period found that student involvement experiences directly impacted African American students' understanding of arts and humanities, personal and social development, thinking and writing skills, understanding science and technology, and vocational preparation. Involvement in academic-related opportunities showed a positive impact in the vocational development of African American students (Flowers, 2004). Social and recreational activities also had positive effects on educational outcomes, yet less than academic related involvement experiences. Attending social events negatively affected students' understanding of science and technology. Following a regular exercise schedule had a negative effect on writing and critical thinking gains, but positive effects on personal and social development (Flowers, 2004).

In a 1987 study, three main factors were found to predict retention of African American/Black students: 1) use of the library; 2) the hours per week spent in the recreation center; and 3) participation in recreational activities at the student union (Mallinckrodt & Sedlacek, 1987). Mallinckrodt & Sedlacek (1987) and Baker (2008) both found that Black students develop a better sense of community and identification when engaged in varsity athletics use of the recreation center. In addition, Baker (2008) found that Latino males had similar results, whereas while Latina women had lower academic success (GPA) if they were involved in student recreation.

Malinckrodt and Sedlacek also found that the student union played a large role in student retention. The student union offered dances, concerts, and outdoor recreation trips. The authors suggest that if a student union could plan more trips and encourage

more students to participate in the student center, then retention rates might rise (Mallinckrodt & Sedlacek, 1987). Overall, the use of both academic and nonacademic student facilities appears to be related to student retention from diverse backgrounds.

Campus Recreation

Belch, Gebel, and Maas (2001) suggest a positive relationship between use of the student recreation center (SRC) and freshman academic performance and that sport and fitness participation are major contributors to the learning, development, and persistence of college students. The research examined 11,076 entering freshmen at Arizona State University over three years from Fall of 1993 to the Fall of 1995. Data were collected using the Student Recreation Center (SRC) card scanner, which kept track of the usage of the SRC in a central database. The number of visits was recorded during the fall semesters of each year. Analysis examined any use versus no use, as well as the extent of use, which includes four categories: 1) 1-4 visits a semester; 2) 5-19 visits a semester; 3) 20-49 visits a semester; and 4) 50 or more visits a semester. Demographic data included student gender, ethnicity, and residency, as well as academic performance, which included high school GPA, high school rank, SAT/ACT score, first semester GPA and first year GPA at the university (Belch et al., 2001).

The sample was 52% female, 53% Arizona residents, and 21% non-White. Almost 75% of the students used the SRC during the first semester. African Americans were most likely to use the SRC (80%), while American Indians (66%) had the lowest use rates. The SRC was used by 89% of nonresidents and 58% of Arizona residents. Use was slightly higher among males (77%) versus females (69%). The entering academic credentials were slightly lower for SRC users, with nonusers having higher mean scores

on the SAT/ACT, higher high school GPAs and high school ranks. On average, the SRC users had higher first semester GPAs and higher first year GPAs compared to nonusers. The persistence rates were also higher for SRC users 92% (first semester) and 71% (first year) compared to 86% and 64% to nonusers, respectively. The persistence rate for all high-end users (20+ visits) was also higher for all freshmen than for students in their second year and beyond (Belch et al., 2001). According to the authors, the SRC might be a place where freshmen integrate themselves into the university. It is also suggested that while the use of the SRC might not be the only reason for high levels of persistence, it may play an important role in student satisfaction, thus leading to increased persistence (Belch et al., 2001). Similarly, another study (Bryant, Banta, & Bradley, 1995) found that students believe there is a strong relationship among persistence and use of the recreation center.

Bryant, Banta, and Bradley's (1995) study demonstrates the impact and effectiveness of campus recreation programs. Using campus recreation for integrating students into the university helped "dispel the notion that all of the important memorable learning in college goes on in the classroom" (Bryant et al., 1995, p.154). Belch et al. (2001) provide an example showcasing that experiences happening outside of the classroom help with the retention of students.

The Quality and Importance of Recreational Services (QIRS) survey designed by Pascarella and Terenzini (1991) looked at student involvement and satisfaction with offered recreational programs. Pascarella and Terenzini believe that the examination of college activities and environment could impact college students and their success at their institution. This pilot test was first administered to 2,586 students at five different

schools before it was validated (Bryant et al., 1995). There were five parts to the survey: 1) recruitment and retention; 2) involvement and interaction associated with student services in general; 3) recreation in particular; 4) satisfaction with recreation programs; and 5) student perceptions about current and future services (Bryant et al., 1995, p. 156). Ninety-five percent of the students who participated reported that they recreated two or more times a week. In addition, 30% of the students visited recreation facilities prior to selecting a college and considered that a factor in deciding where to enroll. Less than ten percent of students said that they did not recreate once a week, the main reason being they did not know about the programs offered or they had too many conflicts with their work schedule (Bryant et al., 1995).

Together these studies suggest that, apart from the required core classes, recreation may be the one experience most college students share. There was also a strong response from students that the importance of recreational activities helps with the persistence of the students at that university. Students reported that participation provided a healthier sense of both physical and mental well-being. These factors led to a connection with the institution, thus enhancing persistence, learning, and graduation rates (Bryant et al., 1995).

Service and Service Learning

Service based learning within the classroom is designed to enhance the educational experience as well as the personal development of students participating in service-learning classes (Chupp & Joseph, 2010). Traditional service-learning coursework is designed to give students real-world context applied to theoretical course content. This experience is designed to put students in a more active and engaged role

than that of a passive classroom learner (Dewey, 1938). Students who participate in social justice-focused service engage in moral development while encouraging a sense of civic responsibility (Astin and Sax, 1998; Chupp & Joseph, 2010). Researchers of service-learning outcomes report evidence of short-term civic and cognitive gains (Batchelder and Root 1994; Gyles and Eyler, 1994).

Students' motivation to service tend to be altruistic in nature, with 91% of students reporting "to help other people" as their number one motivation for completing service (Astin & Sax, 1998). While this may be a motivating factor, Astin and Sax's (1998) longitudinal study of 3,450 students over a four-year period compared the development of 2309 students who participated in community service projects, with 1141 peers. The students who participated in the service projects showed significant growth in 47 of 48 possible measures of civic responsibility, with 42 of the 47 being significant at the p=.001 level. These results show the positive effects students feel towards a sense of civic responsibility.

While some students are required to participate in service, many students elect to participate in service on their own rather than being required to participate in service-learning courses. The difference between community service and service-learning is that service-learning should promote academic rigor as part of the process (Bureau, Cole, & McCormick, 2014). Freshman students who self-select into service tend to be less materialistic and self-report lower scores of making money as a reason to attend college (Astin & Sax, 1998). This commitment to service could be viewed as a high level of commitment for participating students.

Lockeman and Pelco (2013) found that enrollment in service-learning courses was a strong predictor of students' graduation within a six-year period. In the study, following 3,458 freshman at a large, urban mid-Atlantic school for six years beginning with their entering semester, minority and low income students who participated in service learning coursework were more likely than their peers to graduate within six years (Lockeman & Pelco, 2013). While there was an increase in graduation rates, there was no significant relationship to GPA. This might suggest that service learning courses enhance academic integration within the university which in turn, increases the commitment students have to competing their degree even with no direct tie to GPA.

Reed and colleagues (2015) studied three freshmen cohorts from three Midwestern universities to determine whether service learning promotes student persistence in some types of institutions compared to others, and how student characteristics might differ among groups. The three universities (DePaul University, University of Southern Indiana, and University of Wisconsin-Parkside) had sample sizes of 4,348, 2,768, and 1,155 students, respectively. All eligible service-learning courses were required to have three components: a) support the learning outcomes of the course, b) a student reflection of their experiences, and c) the student produces a product that addresses a community need (Reed, Rosenberg, Statham, & Rosing, 2015). The study found that students from all three institutions were more likely to be retained if they took a service-learning course their freshman year. However, that relationship disappeared once GPA was added into model. This could be due to the strong relationship between GPA and graduation rates (Reed et al., 2015).

Not all outcomes of service-learning courses are desired. Poorly organized experiences or those with inadequate time for reflection can reinforce stereotypes of students being providers and community members being dependent on the students' assistance (Mitchell, 2008). This reinforcement does little to challenge pre-existing feelings of prejudice, but rather it reinforces cultural stereotypes, creates feelings of superiority, and can create apathy about social change (Boyle, 2007). To combat these potential negative outcomes, ample time to reflect is imperative. While reflection is often incorporated, critical reflection that initiates change takes ample time and engagement in order to be truly meaningful for the learner. Using deep and meaningful reflection is a key component to help process experiences and connect implications of experience to coursework (Chupp & Joseph, 2010).

From an academic standpoint, participating in education-based service (tutoring and/or teaching) enhanced students' GPA, general knowledge in the discipline, and aspirations to pursue an advanced degree in the field (Astin and Sax, 1998). Students also self-reported greater gains in "deeper learning" from service-learning based courses (Bureau et al., 2010). Astin and Sax argue that this could be interpreted as evidence of the efficacy of cooperative learning and enhanced commitment to an academic discipline. The commitment to study and community engagement might show commitment to involvement, and hence predict higher satisfaction with the collegiate experience (Lockeman & Pelco, 2013, Reed et al., 2015).

Living on Campus

Extensive research has been conducted about the benefits of students living on campus while attending a university. The leading researchers in higher education

research, Astin (1985) and Pascarella and Terenzini (1991) found that living on campus is the single most important college experience that contributes to learning, cognition, and social integration. Some studies (Araujo & Murray, 2010; Noble, Flynn, Lee, & Hilton, 2007; Turley & Wodtke, 2010) have shown that freshmen living on campus have higher GPAs and higher rates of retention than students who do not live on campus. Other studies (Cotten & Wilson, 2006; de Beer, Smith, Jansen, 2009; Pokorny, Holley, & Kane, 2017) suggest that living at home and commuting to school contributes to a lack of sense of belonging because many students depart campus soon after classes have completed and never establish a sense of belonging to campus or a peer social group on campus.

Turley and Wodtke's 2010 study of 2,011 traditional aged (18-24 years old), full time, degree-seeking students from 372 various types of institutions (Carnegie I, II, Masters I, II, public, etc.) examined how different characteristics affect academic performance, taking into account academic performance, gender, disability, race, parental education, living situation, and parental help with tuition. Most students lived on campus (54%), followed by students who lived with their parents (28%), off campus without family (15%), and finally, other types of residence (3%) such as fraternities/sororities, or university owned off campus apartments (Turley & Wodtke, 2010). The initial results (not taking into consideration covariates) showed that students who lived on campus had higher GPAs, worked fewer hours per week, were more likely to have parents who had college degrees, and helped pay some or all of their tuition. The researchers (2010) also found that the students who lived on campus were significantly more advantaged than those who did not live on campus, especially compared to those who lived off campus with family. However, after accounting for covariates such as gender, and type of

institution, the researchers found that students with higher GPAs were from diverse backgrounds and/or students who attended liberal arts colleges (Turley and Wodtke, 2010).

Two separate studies using the same data set at Indiana University - Purdue University in 2008 examined the involvement of students living on campus compared to students who lived off campus (Araujo & Murray, 2010; Araujo & Murray, 2011). The school has a small on-campus population (1,107 beds for an enrollment of 19,700 students) which means that only about 15% of students live on campus at any time in their college experience. The first study (2010) showed that students who had ever lived on campus had GPAs .2 to.5 points higher than their classmates, and students who lived on campus had an increased GPA of .7 to 1.0 GPA points higher than their classmates. This is believed to be due to the utilization of academic support resources, learning environment created by the residence halls, and activities and support from the residence hall staff (Araujo & Murray, 2010). These findings were supported in a subsequent study.

A second study was conducted using the same data in an attempt to understand what causes such a difference in academic success of students living on campus versus off campus. Students living on-campus were more likely to study in their residence as well as engage in extra-curricular activities and stay engaged in those activities after moving off campus (Araujo & Murray, 2011). The students who lived on-campus consumed less alcohol on average and spent more time studying with roommates and students in the same classes even after departing the residence halls. This might indicate

that living on campus creates a culture that is different than living off campus and this culture is more conducive to academic focus and involvement.

Another study considering the engagement of students living on campus showed that students who lived on campus reported feeling more engaged in both social and academic relationships (Lanasa et al., 2007). This study surveyed 731 first time freshman at a public doctoral intensive university in the Midwest about the campus culture. Engagement was a stronger predictor of GPA among those living on campus than among those living off campus. Engagement domains that were significant predictors of GPA among students living on campus included: learning strategies; academic interactions; institutional emphasis; effort; and overall relationships. In contrast, overall relationships was the only domain significantly associated with GPA for students living off campus (Lanasa, et al. 2007).

Student satisfaction is an important factor in understanding the association between living in residence halls and impact on student life. A recent study looked at different styles of residence halls (Bronkema & Bowman, 2017) to see whether the style of residence hall (traditional hall, suite style, or apartment style housing) led to differences in student success. The sample included two public Midwest institutions that had a two-year "live on" requirement. A total of 2,027 students completed an online survey (21% response rate). The sample was over-representative of whites and women (91.1% and 73.2%). First-year students who lived in first-year only traditional (1, 2, or 3 students living in a room with a community bathroom) student housing had higher levels of satisfaction, higher GPAs, and higher intent to persist (Bronkema & Bowman, 2017) compared to students living in mixed class buildings or upper division housing. The

researchers attributed this to the natural and intentional community building program as well as reduction in isolation that occurs in the living environment based on the physical attribute of the building.

A study of campus design and characteristics (Hajrasouliha & Ewing, 2016) of 103 Research 1 and 2 university campuses nationwide found that students who lived on campus had higher retention rates than students who did not live on campus. A ten percent increase in the percentage of on-campus residents netted a 2.43% increase in six-year graduation rates while controlling for other factors (Hajrasouliha & Ewing, 2016). However, the researchers noted that while it is important to consider the number (quantity) of students living on campus, the quality of the experience was also important.

Fraternities and Sororities: Greek Life

Fraternities and sororities (hereafter, "Greek organizations") have a long-standing tradition at many colleges and universities throughout the United States. There are approximately 750,000 current members and 9 million living alumni members from Greek organizations (National Panhellenic conference, 2018; North-American Interfraternity Council, 2018). While there are many stereotypes connecting Greek members to alcohol abuse, partying, and objectification of women (Routon and Walker, 2016), other studies have shown that Greek members have higher levels of involvement which has been linked to higher retention rates, higher graduation rates, and greater satisfaction with the college experience (Astin, 1999; Biddix, 2014; Pike, 2000; Routon & Walker, 2016).

Walker and colleagues (2015) followed the students at Duke University entering the university in 2001 and 2002. A sample of 3,264 students were followed through four

survey waves beginning in the summer before beginning their first semester and during the spring of their first, second, and fourth years of college. Researchers selected 1,180 students (representative of the racial diversity of the campus) to complete surveys about the racial-diversity of their friends, the importance of social or good student was to their identity, what they spent their time doing (academics and social) on campus involvement, and the presence of alcohol and drugs at social events.

Greek students reported higher levels of involvement as well as higher levels of satisfaction with campus (Walker, Martin, & Hussey, 2015). Greek students were also more likely to have studied abroad and spent more time in extra-curricular activities. A key research question was how Greek membership would affect academic performance, relative to students not participating in the Greek system. Greek students were more likely to maintain full time status (9% higher), and were more likely to graduate (7% higher), however there was no significant difference in overall academic performance based on GPA.

To examine long-term effects of Greek membership on fourth year students, researchers examined first year students at 17 four-year colleges across the United States (those who participated in the Wabash National Study of Liberal Arts Education) to understand the influence Greek life has on educational outcomes such as critical thinking skills, moral reasoning, life-long learning, and psychological well being (Hevel, Martin, Weeden, & Pascarella, 2015). Survey questions were designed to collect information about the students' college experience as well as measuring aspects of students' intellectual and personal development. The initial data were collected in the Fall of 2006

and included 4,193 students. Follow up surveys were from Spring 2007 and Spring 2010. A total of 2,212 students with data at follow-up were included.

Results showed that Greek membership does not have negative influences on educational outcomes. However, it does not improve these outcomes either. This is perhaps surprising due to the resources (financial dues for programming, university professionals, and targeted campus services) that are directed to Greek communities (Hevel et al., 2015). The implications of this study suggest that Greek membership is not a detriment to educational outcomes, yet it is also not something to boast about, as there are many resources devoted these organizations.

Another study on Greek involvement utilized data from a sample of 2,391 students from 21 four-year institutions across the United States with a three wave survey during the first two-three weeks on campus, end of the first year, and the end of year four (Bowman & Holmes, 2017). In the sample, 54% were female, 81% were White, 7% were Asian/Pacific Islander, 5% were Black/African American, 5% were Latino/Hispanic, and 2% were from another race/ethnicity. A total of 20% of the students were members of a Greek organization.

Rather than utilize regression to predict outcomes, researchers assigned a propensity score to the students followed by stratification to compare the outcomes of matched students across schools (Bowman and Holmes, 2017). The results without the propensity score adjustment showed that Greek membership predicted greater college satisfaction at the end of year one and four, as well as greater retention numbers each year. Interestingly, participation in Greek organizations was not significantly related to GPA or graduation rates (Bowman and Holmes, 2017). The propensity score showed

similar patterns, except for four-year satisfaction becoming no longer significantly elevated for Greek members. The results also showed an increase in the positive results (increase of 1.6 percentage points) of retention in the first and fourth years for Greek students.

There were slight differences in gender, with female Greek members having a positive relationship between first year GPA, first year satisfaction, and retention all three years, as well as graduation (Bowman and Holmes, 2017). Effect sizes were in the small range (.09 to .15). Meanwhile, male Greek members, reported higher levels of first-year college satisfaction and retention, yet their membership was associated with significantly lower first year grades. There was no significant difference in members of different racial/ethnic groups within this study.

Researchers examined the effects of joining a Greek organization on academic performance, based on GPA among students at Duke University (Donato & Thomas, 2017). Duke University implements an unusual policy among their student population; most college students join Greek organizations the fall of their first year, but Duke University students are not allowed to join a Greek organization until the spring semester of their first year (Donato & Thomas, 2017). Historically, 35% of Duke students choose to affiliate with Greek organizations. The sample included 1008 students from the 2001 and 2002 entering cohorts, and those samples were determined to be representative of the university overall student makeup. The study examined 29,001 student-course observations the semester prior to joining a Greek to coursework a year after joining a Greek organization. Male fraternity members joining a Greek organization experienced a significant decline in their schoolwork, with grades falling on average .168 grade points

(Donato & Thomas, 2017). When the researchers take into account that fraternity members strategically take leniently-graded courses the semester they join the organization, the effect grows to a drop of .216 GPA points. These results suggest that male students attempt to offset the burdens of Greek affiliation by choosing courses that are .048 grade points more lenient in their grading practices (Donato & Thomas, 2017). Subsequent semesters show the effect on GPA differences dropping; third semester membership causes a drop of .132, and forth semester a drop of .089.

The burden of sorority membership is delayed until the members are required to plan and host sorority recruitment for new members. At Duke University, this is during the spring of sophomore year. During this time, the effects of joining a sorority cause a grade point drop of .109 but that number increases to .146 when the leniency effect is taken into consideration (Donato & Thomas, 2017). Modest effects occurred for the semester of affiliation as well as the fall of sophomore year, but those effects were almost fully mitigated by members choosing courses that are graded more leniently.

Students whose SAT scores fell below the median score of the sample (1420 score) showed a much larger effect in their GPA upon joining a Greek organization. New membership showed a drop in GPA of .336 grade points (Donato & Thomas, 2017). Students who were above the SAT median showed a drop of only .120. Furthermore, the trend continued to sophomore year, where the less-prepared students continued to have a .164 point lower GPA, while top SAT performers showed a drop of only .120. This effect showcases the distraction that membership has on academic performance. The results also show that students who are less-prepared to enter the University are more

impacted. While GPA is only one measure of academic success, this impact cannot be discounted when exploring how student involvement impact academic success.

Not all the results of Greek membership are positive. Greek members did show higher levels of alcohol and drug use, lower levels of academic satisfaction and performance, and placed lower importance on diverse thought and friendships (Walker et al., 2015, Donato & Thomas, 2017). Some of these findings were explained by pre-entry conditions such as family income and self-reported importance of social importance, suggesting that Greek organizations might not be the cause of these outcomes, but rather a reflection of predisposing characteristics.

A 2014 study conducted by Routon and Walker followed a sample of college students who graduated with their undergraduate degree from 463 different institutions from 1994-1999. Of these respondents, 19.2% (19,784) reported having joined a social Greek organization. Student responses from a survey conducted during freshman year were compared to results of surveys taken during senior year. Of notice is that all respondents must have graduated so this study examined graduates and not all Greek members. Student outcomes were broken into three categories, including "academic outcomes," "health and behavioral outcomes," and "other outcomes." Male members of fraternities had a statistically lower GPA, although female sorority members did not show a difference in GPAs (Routon & Walker, 2014). Greek students overall were found to have graduated at higher levels than their non-Greek peers, with a 4.8 percent higher graduation rate among male students and 4.7 percent higher among female students.

The "health outcomes" results were in line with previous studies. Members of Greek organizations had higher levels of drinking beer, wine, and/or liquor, smoking

cigarettes, and more hours partying. Females smoked cigarettes at levels 4% higher than non-Greek members, and males were 14.3% more likely to be frequent drinkers (Routon & Walker, 2014). Both male and female Greek members reported decreased convictions of religious belief and attendance in religious services.

Results in the "other outcomes" category found that Greek students planned to work full time at a rate of three to four percent higher than their peers. Greek members were more likely to have participated in community service and to have a professional network, which might contribute to the higher percentage of Greek students having found jobs upon graduation. The percentage of Greek students who wanted to pursue a graduate degree upon graduation was 5% higher than their non-Greek peers (Routon & Walker, 2014). The differences in these categories were believed to be due to a greater network of peers and alumni who offered professional advice and support.

Faculty/Staff and Student Interaction

Faculty and staff interaction is an important factor in student satisfaction with their institution. Institutions of Higher Education have looked for successful ways to connect students with faculty in a variety of settings. These include undergraduate research opportunities, freshmen seminars designed to help with transition issues, and living learning communities (LLCs) within university housing.

According to Kuh, the goal of undergraduate research is to strengthen the skills and abilities for undergraduate students and to "involve students with actively contested questions, empirical observation, cutting edge technologies and a sense of excitement that comes from working to answer important questions" (2008, p. 10). Involvement in undergraduate research provides students with an individual, deep connection with a

faculty member or graduate student (Kuh, 2008). According to Kim and Lundberg, (2016) and Kim and Sax (2009), existing research focuses on two outcomes. The first area of research is based on measuring cognitive related outcomes and enhanced learning abilities. This includes the assessment of critical thinking, analysis, and problem solving. Cognitive skills and critical reasoning skills increase after engaging in undergraduate research (Kim & Lundberg, 2016). The second focus is on education attainment outcomes such as an increase in GPA, (Kim and Sax, 2009) as well as first-year retention (Gregerman, Lerner, von Hippel, Jonides, & Nagda, 1998), persistence to graduation, and graduate school aspiration (Kilgo and Pascarella, 2016).

It is generally accepted that undergraduate research enhances faculty-student relationships, provides socialization into the discipline, and dispels myths about the accessibility of research (Bowman and Holmes, 2017). Chang, Sharkness, Hurtado, & Newman, (2014) found this is especially true for African American students, who have the lowest rate of persistence in science, technology, engineering and math (STEM) majors among all racial/ethnic groups, yet one of the highest major retentions if those students engage in undergraduate research (2014). In addition, undergraduate research in the first or second year increases student retention and graduation rates (Jamelske, 2008; Kuh, 2008). These students are more likely to move into professional and graduate schools than students who do not participate (Hathaway, Nagda, & Gregerman, 2002). Students also show signs of greater analytic and cognitive growth (Hathaway et al., 2002; Webber, Nelson Laird, & BrckaLorenz, 2013).

Survey data collected from 2007-2011 from 455 U.S. institutions were used to understand which students were participating in undergraduate research. The National

Student Survey on Engagement (NSSE) included 111,077 seniors who completed surveys (Webber et al., 2013). Of those who completed the study, 65% percent were women, 47% were first generation, 70% were white, and 19% had completed undergraduate research (Webber, et al., 2013). Minority students had higher participation in undergraduate research than white students. Female students' participation was lower than male participation, and students who lived on campus was higher compared to those who lived off campus. First generation college students also participated at lower levels than their counterparts. Interestingly, being in a large research institution did not equate to higher participation rates. This study indicates that work still needs to be done to include female and first generation college students in undergraduate research.

In a 2017 study, 4,211 respondents from 46 4-year institutions responded to a three-wave survey beginning two-three weeks into their first semester at the university, a second wave two weeks prior to the end of their first year, and a third wave at the end of their fourth year in college (Bowman & Holmes). The sample was 56.6% female, 10.4% African American, 5.6% Asian American/Pacific America, 4.8% Latino/Hispanic, and 2.5% other. A total of 5.2% of the students reported engagement in undergraduate research during their first year in college. Participating in undergraduate research was positively and significantly related to fourth-year GPA and first year student satisfaction (Bowman & Holmes, 2017). Interestingly there was not a significant relationship between GPA of other years, retention rates, or 4-year graduation rates.

A 2014 study by Chang et al. looked at the effect of undergraduate research on minority students using a sample of 3,670 STEM students from 217 institutions who entered college in 2004 and graduated in 2008. Of those students, 1,634 were non-white.

From their first to their fourth year at the university, only 56.5% of African American students and 58.9% of Latino/as stayed in STEM fields compared to 63.5% of white students. However, students from underrepresented groups (those from non-white racial groups and Latino ethnic groups) were 17.4% more likely to stay in STEM fields, compared to their peers, if they engaged in undergraduate research. Students who joined a club or organization connected to their major were 9.3% more likely to stay in a STEM field compared to their peers (Chang et al., 2014). This would suggest the importance of support and mentoring from peers and faculty for students of diverse backgrounds in STEM fields.

LLC programs are designed to promote the academic integration of students living in the residence hall (Turley & Wodtke, 2010). These programs usually include a faculty member (and their family) living in the residence hall with the students. They include faculty lectures, credited and non-credited seminars, events and activities with the faculty member, and advising hours. Research on LLCs show that these communities are high-impact practices that improve student retention, GPA, graduation time, and student satisfaction by fostering students' academic involvement, peer collaboration, faculty mentoring, group identity, and interactive pedagogy (Kanoy & Bruhn, 1996; Palm & Thomas, 2015; Schneider, Bickel, & Morrison-Shetlar, 2015; Pike, Schroeder, & Berry, 1997).

A 2015 study of STEM students at University of Central Florida – Orlando compared students who were members of a LLC to a control group living on campus but not in the program. The students in the LLC were required to live on campus together, take a fall and spring class together where the students learn about academic research,

toured research facilities, and reviewed research literature (Schneider et al., 2015). During the spring course, the students focused on applying for research experiences, learning about graduate college, and studying research ethics. Students also created a short research proposal that led to a digital poster due at the end of the second semester. Outside of the course, students worked three hours a week with a thesis-based master's or doctoral student through a voluntary mentor program. This small community (28 students) earned a 3.37 GPA compared to the control group of 100 students averaging a 2.79 GPA. The retention of the LLC students to their second year was 96%, compared to 74% among the control group. LLC students reported high student satisfaction of mentor relationships, community involvement and support, and student motivation (Schneider et al., 2015).

A study of engineering LLC students compared 19 members of a LLC to 61 non-engineering LLC members (Palm & Thomas, 2015). When controlling for educational inputs at the university, being in the engineering LLC improved student GPA by a significant margin of .422 grade points over a 4-year time period, compared to not participating in an LLC (Palm & Thomas, 2015). Student who were members of the engineering LLC were 2.3 times more likely to be retained at the university than those who were not part of an LLC. The authors surmised these increases were due to community support, faculty interaction and support, and increased sense of belonging at the university.

On-campus Employment

With the continued rising cost of higher education, more students are finding the need to work to pay for school. According to the National Association of Student

Personnel Administration (NASPA), more than 70 percent of college students work part time while they are enrolled in classes, and 40% work more than 30 hours a week (Carnevale, Smith, Melton, & Price, 2015). It is suggested that universities can no longer expect students to devote their full time and attention to academic demands (U.S. Dept. of Education, 2014; Scott- Clayton, 2012; Riggert, Boyle, Petrosko, Ash, & Rude-Parkings, 2006). The benefits of working while attending school are mixed: some research has found that working part time can raise student grades, yet grades decline as students approach full time employment (Pike, Kuh, & Massa-McKinley, 2009; Kulm, & Cramer, 2006). Other research has found that working detracts from the time that students need to focus on coursework and to have positive interactions with faculty and peers (Tinto, 1993).

A qualitative study of student employees found that most students preferred to work on campus if they worked during their undergraduate experience (Cheng & Alcantara, 2007). One of the main reasons for this preference was the convenience of working on campus. While most students worked to meet immediate financial obligations, over time, students reported greater networking opportunities, better summer positions, and in some cases, full-time employment upon graduation (Cheng & Alcantara, 2007). Students reported that working gave them insight into the job market, real world experiences, and an inside track to information to their selected careers.

A study using the 2004 National Survey of Student Engagement (NSSE) data explored the relationship between work, grades, the number of hours spent working, where a student works, and level of student engagement (Pike et.al., 2009). A sample of almost 55,184 first year students from 392 4-year institutions (43% public) were

surveyed. Sixty-six percent were women, 15% were first generation, and 76% lived on campus. Students' self-reported grades were compared to groups where students reported either 1) not working, 2) working fewer than 20 hours on campus, 3) working fewer than 20 hours off campus, or 4) working more than 20 hours on or off campus. Results show significantly lower grades for students working more than 20 hours a week on or off campus. The findings stayed consistent even after adjusting for student backgrounds (Pike et al., 2009). GPAs were higher for students who worked on campus fewer than 20 hours per week, but significance was lost when accounting for student backgrounds. These findings suggest both direct and indirect relationships between grades and student work (Pike et.al., 2009).

Other researchers (Kuh, 2001 & Pike et al., 2009) showed that students who worked off campus, or more than 20 hours a week on campus, had a negative relationship with the Supportive Campus Environment score. The Supportive Campus Environment score measures students' perceptions of institutional commitment to student success and the quality of students' interactions with peers, faculty and administration (Kuh, 2001). Students who worked on campus fewer than 20 hours a week also reported significant positive relationships with faculty interaction. Overall, while this study did not show a significant difference between students who work 20 hours a week or fewer and students who did not work at all, it did show that students who work more than 20 hours a week had significantly lower grades than their peers (Pike et al., 2009). While there was no direct relationship between working on campus or off campus and grades, there was an indirect significant relationship between working on campus and student/faculty relationships.

A study of 243 first-year students looked at the impact of student employment on academic performance and motivation (Huie, Winsler, & Kitsantas, 2014). Students completed a survey during the first two weeks of the semester, and a second survey near the end of the semester. There was no significant difference in GPA for students who did not work compared to peers who did work during their first semester, but they were significant at the end of the first year with students who worked more hours having lower GPAs. The study also found that students who worked on campus had higher GPAs at the end of the first semester and the end of the first year compared to their peers who worked off campus. This suggests that one semester might be too short to understand the impact of working on students (Huie et al., 2014).

According to Cheng and colleagues (2007), students do not feel that work affected their grades in any negative way, which is contradictory to some empirical research. Many students felt that work taught them how to manage their time, focus their studies, and balance their friendships and social lives (Cheng & Alcanantara, 2007; Dundes & Marx 2006). Many students felt that the ability to participate in cost-based activities increased their quality of social life on campus. The students reported a sense of financial independence that they were proud of establishing.

Lastly, a study of 12,000 undergraduate students found that those who worked more than 15 hours a week were less likely to graduate in four years (King, 2002). Students who worked fewer than 15 hours a week were more likely to graduate in four years than those who did not work. A separate study found that students who worked more than 20 hours a week worked to pay for tuition (38%) and living expenses (82%) compared to those students who worked fewer than 10 hours a week (23% and 36%),

respectively (Dundes & Marx, 2006). The students who worked over 10 hours a week experienced more stress (70-80%) compared to those who worked fewer than 10 hours per week (19%). Students who worked more than 20 hours a week were 1.56 times (significant finding) more likely to be binge drinkers and 1.45 times (almost significant) more likely to be sleep deprived (less than seven hours a night) compared to those who worked fewer than 10 hours a week (Miller, Danner, & Staten, 2008).

There are many inconsistencies about the effect of work on students' academic performance. While most researchers agree that as students approach full time work status their grades are affected negatively, the benefits of working part time are mixed (Riggert, Boyle, Petrosko, Ash, & Rude-Parking, 2006; Huie et al., 2014, Kulm et al., 2006). Some studies have found significant relationships between work and grades, while others have shown no significant relationship, especially when accounting for pre-entry conditions. However, most studies show that the effects of on-campus employment are more beneficial than off-campus employment (Riggert et al., 2006).

Honors Programs

Supporters of university honors programs argue that honors programs provide meaningful academic experiences that promote learning and growth for high-achieving students, while benefiting the entire student body. Honors programs provide smaller class sizes, more interaction with tenured and tenure-track faculty, specialized advising, additional scholarships, and greater academic challenges for high ability students (Bowman & Culver, 2017; Brimeyer, Schueths, & Smith, 2014). Honors programs also offer a community environment where students are accepted for their abilities. Many honors programs have an optional living environment and co-curricular program

designed to engage and support students in the program in the hopes of attracting and retaining high achieving students. All of these specialized services require additional financial and personnel resources at a high cost to the university (Brimeyer et al., 2014).

Critics (Pehlke, 2003; Santelices & Wilson, 2010) argue that honors programs reinforce socioeconomic and racial privileges. Honors colleges tend to select students based on standardized test scores as one component of admissions standards, along with high school GPA. Standardized tests have been found to be biased against racial and ethnic minorities and groups with lower socioeconomic status (Pehlke, 2003; Santelices & Wilson, 2010). Honors colleges also segregate a small number of privileged students for distinctly different, more personalized curriculum for 20-25% of their coursework (Brimeyer, et al., 2014). This has led to some students who viewed themselves as "academically elite and deserving of academic privileges." (Mihelich, Storrs, & Pellet, 2007, p.102)

There is a significant difference between honors and non-honors students' GPA, retention rates, and graduation rates (Keller and Lacy, 2013; Astin, 1993; Goodstein & Szarek, 2013). However, this is to be expected based on the high academic standards required for admission to most honors programs (Goodstein and Szarek, 2013). This means that studies should identify and account for status within an honors program when considering predictors of outcomes (Astin, 1993; Goodstein and Szarek, 2013).

Keller and Lacy (2013) find a positive relationship between retention rates and honors college status after the first year. A longitudinal study compared honors students and non-honors students in their retention and graduation rates. The 5-year sample of traditional first year students included 26,115 students, among whom 2,071 were enrolled

in an honors program. There were significant difference in first year retention rates, four-year, five-year, and six-year graduation rated after controlling for entering data (SAT scores, high school GPA, gender, residency, e.g), suggesting that participation in an honors program had meaningful impacts on retention and graduation rates.

However, Slavin, Coladarci, and Pratt (2008) found mixed results for graduation rates when comparing a group of high achieving non-honors students who matched the academic profile of honors students, versus students in the honors program (Slavin et al., 2008). After controlling for SAT scores and high school rank, results of a regression analysis showed that honors students had significantly higher one-year retention rates (94%) compared to their peers (85%). Honors students were 3.1 times more likely to return their sophomore year compared to their non-honors classmates (Slavin et al., 2008). However, it should be noted, in this study there was no significant relationship between four-year graduation rates among honors students as compared to their peers who were not in an honors program.

Lastly, a study of 4,093 students from 41 four-year institutions considered differences in academic outcomes between honors students and non-honors students (Bowman & Culver, 2018). Fifteen percent of respondents were members of an honors program, 56% were female, and 76% were white. Prior to the propensity score adjustment, membership in an honors program was positively related to first year and fourth year GPA, and retention during all four years. However, after the propensity score adjustment, there was not a significant relationship between retention and membership, although members of an honors program were ten percent more likely to graduate in four years compared to their peers. The researchers concluded that the effect size for

membership in honors programs is small in relation to GPA and it is not significant when relating to retention rates. They suggest that high achieving students are likely to be retained regardless of whether they are members of an honors program (Bowman and Culver, 2018).

ROTC Programs

After an extensive search, this researcher was unable to find published articles on the impact ROTC programs on retention, academic grades, or student success. If one views an ROTC program much like other forms of student engagement, it might be assumed to expect similar findings.

CHAPTER THREE: METHODOLOGY

Purpose of this Study

The purpose of this study was to understand the impact first-semester student involvement and student characteristics on retention and graduation rates of college students. While there is extensive and growing research on the impact of each individual category of Astin's Student Involvement Theory on academic performance (with the exception of ROTC), there is a very obvious gap in the literature about how these different experiences relate to each other. Most research is siloed into its respective involvement experience and does not consider the potential influence that other involvement experiences might have on their study. This suggests there are possible interactions among variables of shared variance across variables and suggests this might be why there are so many contradictory findings in the current literature.

Secondly, while more recent studies are considering incoming student demographics as influencers of student outcomes, this has not been a well-utilized practice within the research. Astin (1993) clearly states the importance of using pre-admitted student characteristics to explain student academic outcomes, yet many researchers fail to consider these characteristics. Including incoming student characteristics is imperative for generalizing findings to other institutions.

The current study evaluated whether a relationship between first-year academic performance and first-year student involvement existed, with conceptualization of student involvement based on Astin's (1985) theory. This study also examined the relationship

between GPA, retention, student involvement, and persistence to (4, 5, and 6 year) university graduation, while including students' pre-entry characteristics. This study assessed what contributors predicted academic success and/or persistence at significant levels. A secondary purpose was to understand which students have higher involvement in certain types of activities and how it affected their student success. Understanding student involvement and its subsequent impacts will help universities focus efforts towards increasing student retention and graduation rates by improving university decision-making for policies that relate to student involvement and outcomes.

Research Questions

1. Among full-time students, is there a significant relationship between the level of student involvement during the first semester and graduating at four, five, and six years later?
2. Is there a significant relationship between level of first semester student involvement and first semester GPA?
3. Are certain types of involvement more predictive of student retention than others?
4. Are certain types of involvement more predictive of graduating?

Null Hypothesis

H_o: There is no significant relationship between student involvement and graduating.

H_1: There is a significant relationship between student involvement and graduating.

Description of Site and Research Participants

The participants for this study included traditional aged (graduated from high school the spring prior to enrolling, in addition to being 16-19 years of age) full-time students (12 credits or higher) who were enrolled during the fall 2012 semester at a mid-sized public institution located in the Pacific Northwest. In 2012, the institution had a total enrollment of over 22,000 students, with 2,300 living on campus. Among those students, 2,100 began their first year of study in the fall of 2012, and were included in this study.

Data Collection

As a routine practice, the Office of Institutional Research collects a variety of information on enrolled students. Several sources constructed the data, which were then supplied to the researcher. Institutional Review Board approval was obtained for this study, under protocol (101-SB19-014).

Demographic information from entering students was gathered, including gender, residency, unmet financial need, first generation standing, high school GPA, standardized tests score (ACT and/or SAT), and an "Admissions index score," which is based on each student's standardized test score and GPA. These data were considered entering characteristics and were based either upon student self-reporting during the application process, or based on submitted materials (transcripts, test scores).

Data for this study also included each student's involvement during the first semester of enrollment, which based on university records collected by various departments on campus and matched to each students' record through their student identification number. Student involvement included membership and/or participation in the following: 1) athletics, 2) Greek life, 3) on-campus university housing, 4) service

learning courses, 5) Honors College, 6) on-campus employment, 7) living learning communities, 8) recreation center use, 9) marching band membership, and 10) involvement in the student conduct process. In this study, student involvement was viewed as a set of independent variables that potentially moderate student retention and/or graduation rates.

Outcome variables (and predictor variables in some models) included students' first semester GPA, as well as enrollment status at subsequent years. The primary outcome was time to graduation. This was coded as a series of binary outcome variables (0/1) to indicate whether each student had graduated at four, five, or six years post-entry.

Treatment of Data

The Office of Institutional Research collected student involvement data from their respective sources and matched the demographics, student involvement, GPA, and graduation by way of a unique student identification number assigned to each student upon applying to the university. The student ID number and all other identifying data (first and last names) were removed from the dataset prior to being turned over to the researcher in order to remain compliant with FERPA laws. The data set was transferred to Microsoft Excel, where all data entries were assigned a unique identification number by the researcher prior to analysis.

Data not meeting the inclusion criteria for this study (e.g., ages 16-19, graduated high school graduate within the past year, etc.) were removed prior to analysis. Missing data for involvement were flagged prior to analysis, which allowed the student to be removed from a particular involvement analysis but still be included in other analyses.

Nominal and ordinal data were re-coded as dummy variables to allow the data to be included as predictors in regression models as a set of categorical variables (Field, 2013).

Entering characteristics of students included: 1) Gender; 2) state residency; 3) citizenship; 4) entering high school GPA, 5) entering ACT score, 6) entering SAT score, 7) Admissions Index score, 8) Expected family (financial) contribution, 9) unmet financial need, and 10) Pell Grant eligibility

Involvement variables were coded as binary variables (0 = no, 1 = yes) for each of the following categories: 1) athletics; 2) Greek life; 3) on-campus university housing; 4) service learning courses; 5) Honors College; 6) living learning community; 7) marching band membership; 8) on-campus employment; 9) participation in the student conduct process; and 10) club sports. One involvement variable, campus recreation, was coded using an ordinal scheme based on number of campus recreation uses per semester. The raw data ranged from zero to 110 uses. These data were collapsed to five groups: zero uses were coded as "0", 1-4 visits per semester were coded as "1"; 5-15 visits per semester (less than once a week) were coded as "2"; regular users who visited 16-31 visits per semester (one to two visits per week) were coded as "3"; and frequent users (more than 2 times a week) were coded as "4." This allowed for analyses comparing users and nonusers (0 vs 1 or more), and for analysis comparing extent of usage.

Key student outcome variables included: 1) fall 2012 semester GPA; 2) cumulative GPA at Boise State; 3) total credits earned at Boise State University; and 4) graduation status at 4 years, 5 year, and 6 years (each as a binary variable where 0 = not graduated and 1 = graduated).

Data Analysis

After the data were cleaned and coded, the dataset was exported to SPSS 25 for analysis. Data were analyzed with univariate, bivariate, and multivariate analyses and reported through frequency distribution charts and graphs to characterize the sample.

Due to the dependent variables being dichotomous (retention and graduation), logistic regression was used to analyze whether student involvement significantly affected graduation, while taking into account entering demographics. Logistic regression creates a non-linear prediction variable based on the probability of each predictor variable having an impact on the dependent variable (Muijs, 2011), using a log (p/1-p) transformation to examine the probability of whether graduation occurs, based on the combined values of the independent variables (demographics and interactions). Logistic regression yields an odds ratio for each predictor variable, which represents the amount by which the outcome increases (greater than 1) or decreases (less than 1) when the predictor variable is increased by 1 unit (Field, 2013). When the 95% confidence interval does not include the value of 1.0, the predictor variable is considered to make a significant contribution to predicting the outcome. Overall model fit to examine the incremental improvement of a series of models that add predictor terms of interest was based on the Cox and Snell R^2 test, where 0-0.1 is a poor improvement, 0.1-0.3 is modest improvement, 0.3-0.5 is a moderate improvement, and more than 0.5 is a strong improvement (Muijs, 2011).

Entering demographics and the involvement interaction combinations were "forward blocked" in the logistic regression model to understand which characteristics were significant predictors of graduation. The forward LR method was used to identify the best-fit model. It also allowed all the entering characteristics to be included in the

model for consideration prior to being dropped, if they were found to not be significant ($p < .05$).

Testing Assumptions

Continuous variables (demographics and involvement) were tested for assumptions of linearity as well as the assumption of multicollearity. Results of these tests were reported. Other points of consideration presented in the results section include where there is incomplete information from the predictors, which were identified by looking for large standard errors. The data were also reviewed for complete separation, which occurs when one variable can be perfectly predicted by another variable or combination of variables (Field, 2013). This can also create large standard errors. Finally, over dispersion can occur when the variance is larger than the expected model. This is a signal that the assumption of independence has been violated, which makes the standard errors too small.

CHAPTER FOUR: RESULTS

There were a total of 2,230 students enrolled in a degree seeking program during the fall 2012 semester. Among those students, 246 students did not meet the criteria of being a traditional aged student (above the age of 19 years old and/or not a spring 2012 high school graduate). Twenty-two students enrolled pursued a two-year Associate degree rather than a four-year Baccalaureate degree. The students who earned an Associate degree and did not attempt any additional credits at the university (indicator of pursuing a Baccalaureate degree) after completing their Associate degree were removed from the study. After those students were removed from the sample, a total of 1,962 students remained for analysis.

The sample (Table 4.1) included 889 students who identified as male (45.3%), 1,071 students who identified as female (54.6%) and two students (0.1%) who did not report gender. Most students (n= 1,639, 83.5%) were aged 18 years. The sample included 1223 (62.3%) residents, and 739 (37.7%) non-residents. Fifty-one (2.6%) students identified as international students compared to 1,911 (97.4%) of the students who were from the United States. Because of limited variability in status as an international student, this variable was not used as a demographic covariate in subsequent analyses.

Table 4.1 Sample demographics

Category	Frequency	%
Gender		
Male	889	45.3
Female	1071	54.6
Missing	2	0.1
Total (N = 1962)	1962	100.0
Student Age		
Age 16	5	0.3
Age 17	125	6.4
Age 18	1639	83.5
Age 19	193	9.8
Total (N = 1962)	1962	100.0
In-State Resident		
No	739	37.7
Yes	1223	62.3
Total (N = 1962)	1962	100.0
International Student		
No	1911	97.4
Yes	51	2.6
Total (N = 1962)	1962	100.0

High school academic performance is reported in Table 4.2. The average high school GPA was 3.432 (SD = .374) from 1,930 students. Students' standardized test scores included a SAT mean of 1062 (SD = 143.642) from the 955 students who reported an SAT score, and an ACT mean score of 23.01 (SD = 3.829) among 1426 students reporting ACT scores. The Admissions index, a standardized combination of high school GPAs and test scores, averaged 58.14 (SD = 15.634) and was available for 1,858 students.

Table 4.2 High school academic performance

	M	SD	N	Missing
High School GPA	3.43	0.374	1930	32
SAT Score	1062	143.642	955	977
ACT Score	23.01	3.829	1426	506
Admission Index	58.14	15.634	1858	74

Student Financial information (Table 4.3) is taken from the students' Free Application for Federal Student Aid (FAFSA) form. Expected family contribution (EFC) is based on a government-created formula that calculates income, debts, number of students in college, and other factors to determine how much a family should be able to contribute to their student's college costs. The EFC mean was $15,297 (SD = $20,864) among the 1,663 students who submitted a FAFSA form. Unmet Financial need is based on the cost of attendance at Boise State University in 2012, minus the expected financial contribution. A student who is Pell Eligible has to meet certain government lower income standards (below $50,000/yr.).

Table 4.3 Student financial information

	Mean	SD	N	Missing
Expected Financial Contributions	$15,297.00	$20,864.00	1663	259
Unmet Financial Need	$6,139.98	$7,313.51	1962	0
Pell Eligible	Frequency	%		
Yes	707	36.0		
No	956	48.7		
Missing	299	15.2		
Total (N = 1962)	1962	100.0		

Academic performance during the first semester are presented in Table 4.4. Students completed an average of 12.47 credits (SD = 3.897) and earned an average Fall

GPA of 2.678 (SD = 1.071). GPA was subsequently broken into ordinal categories as shown in Table 4.4. Slightly fewer than 10% of students earned a GPA of less than 1.0 (n =189 students, 9.63%), while 271 students (13.81%) earned a GPA between 1.0 – 1.99. There were 529 students (26.96%) who earned a 2.0 – 2.99 GPA, 882 students (44.95%) who earned between 3.0 – 3.99, and 91 students (4.64%) who earned a perfect 4.0 GPA.

Retention from fall 2012 to spring 2013 (see Table 4.4) included a total of 1,781 students (90.8%) and retention from the first year to the second year included 1402 students (71.5%) enrolling in coursework for their second year.

Table 4.4 Fall 2012 class academic performance

	Mean	SD	N
Credits earned Fall 2012	12.470	3.897	1962
Fall 2012 GPA	2.678	1.071	1962
Fall 2012 GPA	Frequency	%	
0.0-.99 GPA	189	9.63	
1.0-1.99 GPA	271	13.81	
2.0-2.99GPA	529	26.96	
3.0-3.99 GPA	882	44.95	
4.0 GPA	91	4.64	
Total (N = 1962)	1962	100.00	
Retention to Spring 2013	Frequency	%	
Yes	1781	90.8	
No	181	9.2	
Total (N = 1962)	1962	100.0	
Retention to Fall 2013	Frequency	%	
Yes	1402	71.5	
No	560	28.5	
Total (N = 1962)	1962	100.0	

Negative and positive student activities and involvement (Table 4.5) during the first semester were measured by a variety of constructs, including conduct violations, as well as participation in a number of university-organized and professionally-staffed activities. Among the 1,962 students for whom conduct data were available, 479 (24.4%) were found responsible for a conduct violation through the Dean of Students Office during their first semester. A total of 1,144 students (58.3%) lived on campus, and 124 students (6.3%) were part of a Living Learning Community within the residence halls. A total of 88 students (4.5%) were members of the Honors College, 98 (5%) were student athletes and 25 (1.3%) were members of the ROTC program. There were 70 students (3.6%) who participated in the Marching Band, while 118 (6%) joined Greek organizations. During their first semester, 298 students (15.2%) took a course that had a service-learning component in in it. Student participation in club sports totaled 80 students (4.1%) and 149 students (7.6%) had on-campus employment.

Table 4.5 Fall 2012 student involvement participation

	Conduct Violation	Live on Campus	Living Learning Community	Honors College	Student Athlete	ROTC	Marching Band	Greek Life	Service Learning	Club Sports	On Campus Employment
Participant											
Frequency	479	1144	124	88	98	25	70	118	298	80	149
Percent	24.4	58.3	6.3	4.5	5	1.3	3.6	6	15.2	4.1	7.6
Non-Participant											
Frequency	1483	818	1838	1874	1864	1937	1892	1844	1664	1882	1813
Percent	75.6	41.7	93.7	95.5	95	98.7	96.4	94	84.8	95.9	92.4
Total (N = 1962)	1962	1962	1962	1962	1962	1962	1962	1962	1962	1962	1962
Total Percent	100	100	100	100	100	100	100	100	100	100	100

Campus Recreation	0 Visits	1-4 Visits	5-15 Visits	16-32 Visits	<32 Visits	Total
Frequency	536	394	440	314	278	1962
Percent	27.3	20.1	22.4	16	14.2	100

Campus Recreation Center usage records for the fall semester showed that 536 students (27.3%) did not visit the Recreation Center, 194 (20.1%) visited 1 - 4 times, 440 (22.4%) visited 5 - 15 times, 314 (16%) visited 16 - 32 times, and 278 (14.2%) visited more than 32 times (more than 2 times a week on average).

The graduation rates (Table 4.6) of students were measured at four, five, and six-years after entry (spring 2012). The total number of students who graduated within four years totaled 417 students (21.3%), 796 students (40.6%) had graduated within five years, and 946 students (48.2%) had graduated by the end of six years.

Table 4.6 Graduation rates

	4 year (spring 2016)	5 year (spring 2017)	6 year (spring 2018)
Graduate			
Frequency	417	796	946
Percent	21.3	40.6	48.2
Non-Graduate			
Frequency	1545	1166	1016
Percent	78.7	59.4	51.7
Total (N = 1962)	1962	1962	1962
Total Percent	100	100	100

Analysis

This study was designed to explore the relationship between student involvement and retention and graduation rates, while accounting for incoming characteristics. Understanding how these relationships affect each other can provide guidance for policy decisions at undergraduate institutions. Bivariate and multivariate analysis explored the relationship between entering student characteristics (e.g., gender, residency, financial

status) and student involvement (e.g., Greek Life, Honors College, Marching Band) on the following outcomes: first semester GPA; first semester and first year retention rates; and graduation rates. Depending on the measurement characteristics of the variables of interest (i.e., binary, ordinal, continuous), techniques such as correlation, ANOVA, independent t-test, chi-square, and logistic regression were used to explore the relationships.

First Semester GPA and Entering Characteristics

Correlations were calculated (Table 4.7) to determine whether significant relationships existed between first semester GPA and characteristics of students upon entering the university. Due to a non-normal distribution of GPA, Spearman's rho correlation was used. As related to GPA, there was a significant relationship to how well students performed on the SAT, r_s - .238, 95% CI [.178, .296], $p < .001$. There was also a significant relationship between GPAs and ACT scores, r_s - .329, 95% CI [.282, .374], $p < .001$. The relationship between first semester GPA and college GPA was r_s - .570, 95% CI [.540, .599], $p < .001$. A significant relationship also existed between first semester GPA and Admissions index, r_s - .535, 95% CI [.502, .566], $p < .001$. A significant negative relationship was found between GPA and expected financial contributions, r_s - .150, 95% CI [.103, .196], $p < .001$, as well as GPA and unmet financial need, r_s -.166, 95% CI [-.208, -.123], $p < .001$.

Independent sample t-tests were performed to determine whether there was a significant difference between first semester GPA and students' residency status. On average, the GPAs of students who were from out of state were higher (M = 2.93, SD = 0.888) than those among students who were in-state residents (M = 2.53, SD = 1.141).

This difference, 0.4, 95% CI [.313, .494] was significant $t(1839.663) = 8.749$, $p < .001$; and the effect size, $d = 0.199$, was small.

Table 4.7 Correlations between Fall 2012 GPA and entering characteristics

		Fall GPA	SAT	ACT	High school GPA	Admissions Index	EFC	Unmet Need
Fall 2012 GPA	Correlation	1	.238**	.329**	.570**	.535**	.150**	-.166**
	Coefficient		[.178, .296]	[.282, .374]	[.540, .599]	[.502, 566]	[.103, .196]	[-.208, -.123]
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000
	N	1962	955	1426	1930	1858	1663	1962
SAT	Correlation		1.000	.845**	.280**	.582**	.146**	-.068*
	Coefficient			[.817, .869]	[.221, .337]	[.538, .623]	[.078, .212]	[-.13, -.005]
	Sig. (2-tailed)			0.000	0.000	0.000	0.000	0.037
	N		955	463	948	918	806	955
ACT	Correlation			1.000	.376**	.676**	.210**	-.169**
	Coefficient				[.331, .419]	[.647, .703]	[.157, .262]	[-.218, -.119]
	Sig. (2-tailed)				0.000	0.000	0.000	0.000
	N			1426	1410	1398	1256	1426
High School GPA	Correlation				1.000	.897**	.073**	-.150**
	Coefficient					[.897, .905]	[.025, .120]	[-.193, -.107]
	Sig. (2-tailed)					0.000	0.003	0.000
	N				1930	1851	1645	1930
Admissions index	Correlation					1.000	.122**	-.168**
	Coefficient						[.074, .169]	[-.211, -.124]
	Sig. (2-tailed)						0.000	0.000
	N					1858	1617	1858
EFC	Correlation						1.000	-.699**
	Coefficient							[-.722, -.674]
	Sig. (2-tailed)							0.000
	N						1663	1663

Note. * p < .05. ** p < .01. *** p < .001. CIs reported in brackets.

Independent sample t-tests were performed to determine whether there was a significant difference between first semester GPAs for domestic versus international students. The GPAs of domestic students (M = 2.67, SD = 1.072) were lower than among international students (M = 2.80, SD = 1.101), but this difference, -0.13, 95% CI [-0.428, 0.167] was not significant $t(1960) = -.860$, $p = .390$; and the effect size, $d = 0.01$, was small.

Independent sample t-tests were performed to determine whether there was a significant difference between first semester GPA and gender. GPAs were higher among female students (M = 2.79, SD = 1.020) than among male students (M = 2.54, SD = 1.113). This difference, 0.24, 95% CI [.153, 0.344] was significant $t(1822.497) = 5.126$, $p < .001$; and the effect size, $d = 0.12$, was small.

Independent sample t-tests were performed to determine whether there was a significant difference between first semester GPA and Pell eligibility. The GPAs of students who were not Pell eligible (M = 2.78, SD = 1.037) were higher than among students who were Pell eligible (M = 2.51, SD = 1.090). This difference, .27, 95% CI [0.167, 0.373,] was significant $t(1661) = 5.137$, $p <.001$; and the effect size, $d = 0.12$, was small.

Table 4.8 Fall GPA and entering characteristics

Entering Characteristics	M	SD	t	df	CI	P	d
Residency			8.749	1,839.663	0.313, 0.494	.000***	.19
In-State	2.53	1.141					
Out-of-state	2.93	0.888					
Country			-0.860	1,960.00	-0.428, 0.167	.390	.01
International	2.80	1.101					
Domestic	2.67	1.072					
Gender			5.126	1,827.497	0.153, 0.344	.000***	.12
Female	2.79	1.020					
Male	2.54	1.113					
Pell Eligible			5.137	1,661	0.167, 0.373	.000***	.12
Yes	2.51	1.090					
No	2.78	1.037					
Note. *p < .05. **p < .01. ***p < .001							

An ANOVA (N = 1663) was used to analyze the difference between expected financial contribution (EFC) groups (based on percentage of Cost of Attendance) to determine whether there was a difference in GPAs among these groups (results not shown in tables). Students who had an EFC of zero had an average GPA of 2.46 (SD = 1.130, N = 307) while students who had an EFC percentage of 0.1 to 19.9 had an average GPA of 2.53 (SD = 1.06, N = 391). Students who had an EFC percentage of 20 to 39.9 had an average GPA of 2.65 (SD = 1.052, N = 216), students who had an EFC percentage of 40 to 59.9 had a mean GPA of 2.90 (SD = 1.032, N = 179)) and students who had and EFC percentage of 60 to 79.9 had an average GPA of 2.83 (SD = 1.052, N = 112). Students who had an EFC percentage of 80 to 99.9 had a mean GPA of 2.78 (SD = 1.065, N = 120) and students who had an EFC percentage of 100 to 200 had a mean GPA of

2.80 (SD = 0.996, N = 226). Finally, students who had an EFC percent over 200 had a mean GPA of 2.83 (SD = 0.994, N = 112). The homogeneity of variance was met and showed that EFC had significant effect on Fall GPA $F(7, 1655) = 5.352$, $p < .001$, $\rho = .13$.

First Semester GPA and Student Involvement

Independent sample t-tests were performed to determine whether there were significant relationships between first semester GPA and various forms of student involvement (Table 4.9). There was no significant relationship between first semester GPA and students who receive conduct violations, being part of a living learning community, being a marching band member, club sport participant, Greek life member, or member of ROTC. GPAs were higher for students taking a service learning class ($p < .05$), and for students who worked on campus during their first semester ($p < .05$). A significant relationship was also found between GPA and being members of the Honors College, and students who were athletes ($p < .001$).

An ANOVA (N = 1663) was used to examine whether there was a difference in GPAs among recreation center users. Nonusers had an average GPA of 2.40 (SD = 1.219) while students who visited 1- 4 times had an average GPA of 2.59 (SD = 1.096). Students who visited the Recreation Center between 5 - 15 times had an average GPA of 2.72 (SD = 0.983), users who visited 16 - 31 times had a mean GPA of 2.95 (SD = 0.893) and students who visited more than 32 times a semester had an average GPA of 2.94 (SD = 0.885). The Welch post hoc test showed significant differences in GPA by use of the Recreation Center $F(4, 923.301) = 20.043$, $p < .001$; with a medium effect size, $d = .55$.

These results suggest that certain types of student involvement might have a positive effect on student GPA. Certain forms of involvement might not come as a surprise, given that Honors College students are selected for academic achievement; however, other forms of involvement such students living on campus, being a student athlete, and working on campus, might not be expected to lead to higher first semester GPAs and other measure of student success such as retention and graduation.

First Semester GPA and Retention Rates

An independent sample t-test was performed to determine where there was a significant difference between first semester GPA and students who returned for the spring 2013 semester. Students who returned for the spring semester had higher fall GPAs (M = 2.78, SD = .979) compared to students who did not return (M = 1.62, SD = 1.335) for the spring semester. This difference, -1.16, 95% CI [-1.355, -0.953] was significant $t(200.15) = -11.326$, $p < .001$; with a medium effect size, $d = 0.62$.

Table 4.9 First semester GPA and student involvement t-tests

Involvement	M (Yes)	SD (Yes)	M (No)	SD (No)	t	df	CI	P	d
Conduct Violation	2.74	0.982	2.65	1.097	-1.664	894.275	-0.192, 0.015	.096	.05
Live on Campus	2.80	0.994	2.50	1.146	-6.099	1,601.616	-0.400, -0.205	.000***	.15
Living Learning Community	2.79	1.054	2.67	1.071	-1.210	1,960.00	-0.315, 0.074	.226	.02
Honors College	3.58	0.501	2.63	1.071	-16.142	127.965	-1.068, -0.834	.000***	.81
Athletes	3.14	0.675	2.65	1.082	-6.715	124.784	-0.632, -0.344	.000***	.53
Marching Band	2.72	0.995	2.67	1.073	-0.338	1,960.000	-0.299, -0.211	.735	.01
Service Learning	2.83	0.978	2.64	1.084	-2.973	438.057	-0.309, -0.063	.003**	.08
Work on campus	2.89	0.957	2.66	1.077	-2.818	180.270	-0.394, -0.069	.005**	.21
Club sports	2.82	0.880	2.67	1.077	-1.539	89.358	0.101, -0.358	.127	.16
Greek Life	2.67	1.086	2.67	1.070	0.047	1,960.000	-0.194, 0.204	.962	.00
ROTC	2.67	0.918	2.67	1.072	-0.001	1,960.000	-0.423, 0.422	.999	.00
Campus Recreation								.000***	.55
0 visits	2.40	1.219							
1-4 visits	2.59	1.096							
5-15 visits	2.72	0.983							
16-31 visits	2.95	0.893							
32+ visits	2.94	0.885							

Note. *p < .05. **p < .01. ***p < .001

Considering the next academic year, students who returned for the fall 2013 semester had higher fall 2012 GPAs (M = 2.98, SD = 0.819) compared to those students who did not return (M = 1.91, SD = 1.229) for the fall semester. This difference, -1.07, 95% CI [-1.185, -0.963] was significant $t(762.506) = -19.056$, $p < .001$; with a medium effect size, $d = 0.56$.

These results suggest the large impact that first semester GPA has on first semester and first year retention. Results suggest students who earn higher GPAs are more likely to return to the university and continue their studies. Understanding ways to positively impact first semester GPAs could increase retention rates and in turn potentially increase graduation rates.

First Semester GPA and Graduation Rates

An independent samples t-test was performed to determine whether there was a significant difference between GPAs earned during the first semester and graduation rates at the four, five, and six year mark, respectively. On average, students who graduated in four years earned a significantly higher GPA their first semester (M = 3.41, SD = .555), than those not graduating after four years (M = 2.47, SD = 1.088). This difference, -0.96, 95% CI [-1.016, -0.865] was significant $t(1338.31) = -24.235$, $p < .001$; with a medium effect size, $d = 0.55$. Five year graduates earned a higher GPA during their first semester (M = 3.26, SD = .655) compared to those not graduating in five years (M = 2.27, SD = 1.115). This difference, -0.99, 95% CI [-1.062, -0.905] was significant $t(1921.328) = -24.556$, $p < .001$; with a medium-sized effect, d = 0.49. Six year graduates, on average, also earned a higher GPA during their first semester (M = 3.22, SD = 0.675) compared to those not graduating in six years (M = 2.17, SE = 1.120). This difference, -1.05, 95% CI

[-1.134, -0.972] was significant $t(1686.135) = -25.417$, $p < .001$; with a medium effect size, $d = 0.52$.

First semester GPA had a significant effect on graduation rates. GPA earned during the first semester had a medium effect on four, five, and six year graduation rates, respectively. Overall, first semester GPA seems to be a significant indicator of future success at the university.

Entering Characteristics and Retention Rates

Retention to Spring Semester

Marginally significant differences were also found (Table 4.10) between students eligible or not eligible for Pell support X^2 (1) = 2.863, p = .091 and their retention. Significant differences were noted in retention of students based on residency, X^2 (1) = 17.760, $p < .001$ with out-of-state students having higher odds of retention (odds ratio = 2.128), with a small effect size, V = .1. Significant differences in retention were also found for gender, X^2 (2) = 8.988, p = .011, where females were 1.588 times more likely to be retained than males with a small effect size V = .07. The category including International students did not provide enough cell coverage for cross-tabulation analysis.

Table 4.10 Cross-tabulation of entering characteristics and retention to spring semester

	Retention to Spring					Effect size (Cramér's	
	No	Yes	χ^2	df	P	V)	e^{β}
International Students							
No	180	1731	-	-	-	-	-
Yes	1[a]	50					
Residency							
In state	139	1084	17.760	1	.000***	0.10	0.470
Out of State	42	697					2.128
Gender							
Male	101	788	8.988	2	.011**	0.07	0.630
Female	80	991					1.588
Pell Eligible							
No	77	879	2.865	1	.091	0.04	1.334
Yes	74	633					0.749

Note. *p < .05. **p < .01. ***p < .001. [a] Denotes not enough coverage for analysis.

Tests examining student involvement and retention to the spring semester (Table 4.11), showed significantly higher odds of retention for students who were part of the conduct process, lived on campus, worked on campus, and visited the recreation center (p < .001). Students who participated in the Honors College, Athletics, Marching Band, and ROTC did not have enough cell coverage for analysis.

Table 4.11 Cross-tabulation of student involvement and retention to spring semester

	Retention to Spring					Effect size	
	No	Yes	χ^2	df	P	(Cramér's V)	e^{β}
Conduct violation							
No	157	1326	13.443	1	.000***	0.13	0.445
Yes	24	455					2.245
Living on campus							
No	106	712	23.347	1	.000***	0.11	0.470
Yes	75	1069					2.128
Learning community							
No	173	1665	1.216	1	.270	0.03	0.663
Yes	8	116					1.507
Honors college							
No	178	1696	-	-	-	-	-
Yes	3[a]	85					-
Student Athlete							
No	180	1684	-	-	-	-	-
Yes	1[a]	97					-
Marching Band							
No	178	1714	-	-	-	-	-
Yes	3[a]	67					-
Service Learning							
No	160	1504	1.991	1	.158	.032	0.712
Yes	21	277					1.403
Work on Campus							
No	175	1638	5.203	1	.023*	.051	0.392
Yes	6	143					2.546
Recreation Center							
Visits (0)	86	450	42.573	4	.000***	.147	
Visits (1-4)	29	365					2.405
Visits (5-15)	33	407					2.357
Visits (16-31)	16	298					3.559
Visits (32+)	17	261					2.934
Club Sports							
No	176	1706	.882	1	.348	.021	0.646
Yes	5	75					1.547
Greek Life							
No	166	1678	1.823	1	.177	.030	1.472
Yes	15	103					0.679
ROTC							
No	180	1757	-	-	-	-	-
Yes	1[a]	24					-

Note. *p < .05. **p < .01. ***p < .001 (N = 1962). [a] Denotes not enough cell coverage for analysis

Independent samples t-tests were performed to determine whether there were differences in a series of entering characteristics between students who were retained to spring semester (n = 1781) versus those not retained to spring semester (n = 181). Sample sizes for analyses differ slightly from these overall totals due to small amounts of missingness on demographic variables (please see Table 4.11).

Entering high school GPA differed significantly for retained students: on average, participants who were retained to spring semester entered with a higher school GPA (M = 3.45, SD = .370), than those not being retained to spring semester (M = 3.25, SD = .361). This difference, -0.19, 95% CI [-0.256, -0.142] was significant $t(1928) = -6.873$, $p < .001$; with a small effect size, $d = 0.15$. Entering SAT scores did not differ between students retained (M = 1063.89, SD = 143.649), as compared to those not retained (M = 1044.91, SD = 143.696), $t(953) = -.935$, $p = .350$; with a small effect size, $d = 0.03$. Entering ACT scores did differ among those retained: students who were retained entered with higher ACT scores (M = 23.12, SD = 3.827), versus those not retained (M = 22.09, SD = 3.740). This difference, -1.02, 95% CI [-1.677, -0.376] was significant $t(1424) = -3.097$, $p < .05$; with a small effect size, $d = 0.08$. The entering Admissions Index was significantly higher for retained students (M = 58.84, SD = 15.568), versus those not retained (M = 51.51, SD = 14.708). This difference, -7.33, 95% CI [-9.727, -4.939] was significant $t(1856) = -6.007$, $p < .001$; with a small effect size, $d = 0.13$.

Finally, financial characteristics of students were examined through independent samples t-tests by retention status. Students who were retained to spring semester entered with a higher Expected Family Contribution (M = $15,770.87, SD = $21,300.58), than those not retained (M = $10,559, SD = $15,097.89). This difference, -$5,211.41, 95% CI

[-$7,862.97, -$2,559.86] was significant $t(214.719) = -3.874$, $p < .015$; with a small effect size, $d = 0.256$. Unmet financial need was also lower among those retained: students retained to spring semester entered with less unmet financial need (M = $5,625.91, SD = $7,009.09), than those not retained (M = 11,198.33, SD = 8,288.22). This difference, 5,572.41, 95% CI [4314.51, 6,830.32] was significant $t(206.997) = 8.734$, $p < .001$; with a medium effect size, $d = 0.51$.

Chi-square analyses were used to examine whether EFC groups (based on their percentage of Cost of Attendance) differed in retention to spring semester; there was no significant difference in retention between EFC groups, $X^2(7) = 7.597$, $p = .369$, $V = .068$, but there was a significant difference by unmet need, $X^2(3) = 105.478$, $p = .000$, $V = .232$ indicating that students with less unmet financial need were more likely to be retained to spring semester.

Retention to Fall 2013 Semester

As was done previously for retention to spring 2012, a series of chi-square tests were used to examine relationships between student entering demographics and retention to fall 2013 (the end of the first full year of study), with results shown in Table 4.12. Results showed significantly higher retention of international students $X^2 (1) = 9.014$, $p = .003$, $V = .07$ versus domestic students. Significantly higher retention was also found for Pell eligible students $X^2 (1) = 11.064$, $p = .001$, out-of-state students, and female students.

Table 4.12 Cross-tabulation of entering characteristics and retention to fall semester

	Retention to Spring					Effect size (Cramér's	
	No	Yes	χ^2	df	P	V)	e^{β}
International Students							
No	555	1356	9.014	1	.003**	0.07	0.266
Yes	5	46					3.765
Residency							
In state	405	818	33.292	1	.000***	0.13	0.536
Out of State	155	584					1.865
Gender							
Male	280	609	7.623	2	.022**	0.06	0.770
Female	280	791					1.299
Pell Eligible							
No	250	706	11.064	1	.001**	0.08	1.433
Yes	238	469					0.698

Note. *p < .05. **p < .01. ***p < .001

An independent samples t-test was performed to determine if there was a difference between retention to fall 2013 semester and entering high school GPA. On average, participants who were retained to fall semester entered with a higher school GPA (M = 3.48, SD = .36), than those not being retained to fall semester (M = 3.30, SD = .377). This difference, -0.17, 95% CI [-0.211, -0.139] was significant $t(1928) = -9.502$, $p < .001$; with a small effect size, $d = 0.21$.

An examination of the difference between retention to spring semester and SAT scores. On average, participants who were retained to fall 2013 semester entered with a higher SAT score (M = 1066.12, SD = 144.265), higher than those not being retained to fall semester (M = 1052.18, SD = 141.390). This difference, -13.846, 95% CI [-35.433, 7.542] was not significant $t(953) = -1.274$, $p = .203$; with a small effect size, $d = 0.04$.

An independent samples t-test was performed to determine if there was a difference between retention to fall semester and entering ACT score. On average, participants who were retained to fall semester entered with a higher ACT score (M = 23.26, SD = 3.883), than those not being retained to spring semester (M = 22.26, SD = 3.765). This difference, -0.819, 95% CI [-1.252, -0.386] was significant $t(1424) = -3.709$, $p < .001$; with a small effect size, $d = 0.10$.

An independent samples t-test was performed to determine if there was a difference between retention to fall 2013 semester and entering Admissions Index. On average, participants who were retained to fall semester entered with a higher Admissions Index (M = 60, SD = 15.558), than those not being retained to spring semester (M = 53.62, SD = 14.891). This difference, -6.379, 95% CI [-7.917, -4.841] was significant $t(1856) = -8.133$, $p < .001$; with a small effect size, $d = 0.18$.

An independent samples t-test was performed to determine if there was a difference between retention to fall 2013 semester and Expected Family Contributions. On average, participants who were retained to fall semester entered with a higher Expected Family Contribution (M = 16,640.50, SD = 21,957.14), than those not being retained to spring semester (M = 12,064.43, SD = 17,565.32). This difference, -5,211.41, 95% CI [-6579.461, -2,572.670] was significant $t(1127.258) = -4.482$, $p < .001$; with a small effect size, $d = 0.159$.

An independent samples t-test was performed to determine if there was a difference between retention to fall 2013 semester and unmet financial need. On average, participants who were retained to fall 2013 semester entered with a lower amount of unmet need (M = 5,483.49, SD = 7,111.98), than those not being retained to spring

semester (M = 7783.55, SD = 7,555.25). This difference, 2,300.05, 95% CI [1571.03, 3029.08] was significant $t(975.946) = 6.191$, $p < .001$; with a small effect size, $d = 0.19$.

A chi-square test was used to analyze the difference between EFC groups based on their percentage of Cost of Attendance to determine if there was a difference in retention to spring semester. Students who had higher EFC to COA of attendance percentage had a significantly higher retention rate than those who had a lower EFC to COA percentage, $X^2(7) = 22.528$, $p = .002$, $V = .116$. Students who had no unmet need were more likely to be retained to fall semester than students who had had higher amounts of unmet need $X^2(3) = 44.456$, $p = .000$, $V = .151$.

Results of student involvement and its effect on retention to fall semester (Table 4.13) show students involved in the conduct process (1.817), living on-campus (1.796), Recreation Center use (1.271-2.843), and student athletes (3.683) all had higher odds of being retained to fall semester when $p < .001$. Student in the Honors program had significantly higher odds (2.900) than their peers when $p < .01$ and students in service learning classes (1.420) had higher odds than their peers when $p < .05$. However, the effect size $d = .2$ was small for all significant relationships.

Table 4.13 Cross-tabulation of student involvement and retention to fall semester

	Retention to Fall					Effect size	
	No	Yes	χ^2	df	P	(Cramér's V)	e^{β}
Conduct violation							
No	464	1019	22.452	1	.000***	0.11	0.550
Yes	96	383					1.817
Living on campus							
No	291	527	34.016	1	.000***	0.13	0.556
Yes	269	875					1.796
Learning community							
No	533	1305	2.973	1	.085	0.39	0.681
Yes	27	97					1.467
Honors college							
No	549	1325	11.625	1	.001**	0.077	0.344
Yes	11	77					2.900
Student Athlete							
No	550	1314	17.008	1	.000***	.093	0.271
Yes	10	88					3.683
Marching Band							
No	543	1349	.645	1	.422	0.02	0.796
Yes	17	53					1.255
Service Learning							
No	492	1172	5.644	1	.018*	.054	0.704
Yes	68	230					1.420
Work on Campus							
No	526	1287	2.590	1	.108	.036	0.723
Yes	34	115					1.382
Recreation Center							
Visits (0)	199	337	45.306	4	.000***	.152	
Visits (1-4)	125	269					1.271
Visits (5-15)	116	324					1.649
Visits (16-31)	54	260					2.843
Visits (32+)	66	212					1.897
Club Sports							
No	544	1338	2.984	1	.084	.039	0.614
Yes	16	64					1.626
Greek Life							
No	530	1314	.599	1	.439	.017	0.845
Yes	30	88					1.183
ROTC							
No	556	1381	-	-	-	-	-
Yes	4[a]	21					-

Note. *p < .05. **p < .01. ***p < .001 (N = 1962). [a] Denotes not enough cell coverage for analysis.

Four-year Graduates

Entering Characteristics

A series of Chi-square tests were computed to examine differences in four-year graduation status (yes/no), based on students' entering characteristics (Table 4.14). Several significant relationships were noted. The odds of graduation were higher among out-of-state residents as compared to in-state residents (odds ratio = 2.667), among females as compared to males (odds ratio = 1.761), and among students not eligible for Pell support, as compared to those who were eligible (odds ratio = 2.100).

Table 4.14 Cross-tabulation of 4-year graduation and entering characteristics

	4-year Graduate					Effect size (Cramér's	
	No	Yes	χ^2	df	P	V)	e^{β}
International Student							
No	1498	413	-	-	-	-	-
Yes	47	4[a]					-
Residency							
In State	1041	182	78.780	1	.000***	.200	.375
Out of State	504	235					2.667
Gender							
Male	745	144	25.549	2	.000***	.110	.568
Female	799	272					1.761
Pell Eligible							
No	706	250	33.476	1	.000***	.142	2.100
Yes	605	102					.476

Note. *p < .05. **p < .01. ***p < .001. [a] Denotes not enough cell coverage for analysis.

Independent t-tests were used to examine whether entering characteristics differed among those who graduated or did not graduate, at four years. Those who graduated in four years entered the university with a higher SAT scores (M = 1,091.87, SD = 144.454), compared to their peers not graduating (M = 1,051.51, SD = 141.825). This

difference, -40.352, 95% CI [-60.691, -20.013] was significant t(479.183) = -3.898 p < .001; with a small effect size, *d* = 0.175. Graduates also entered the university with a higher ACT scores (M = 24.46, SD = 3.679), compared to their peers not graduating (M = 22.66, SD = 3.783). This difference, -1.802, 95% CI [-2.292, -1.320] was significant t(1424) = -7.214, p < .001; with a small effect size, *d* = 0.18. Graduates entered the university with a higher entering high school GPA scores (M = 3.60, SD = .342), compared to their peers not graduating (M = 3.38, SD = .368). This difference, -0.219, 95% CI [-0.257, -0.181] was significant t(688.827) = -11.318, p < .001; with a medium effect size, *d* = 0.395. Lastly, graduates also entered the university with higher Admissions index scores (M = 65.53, SD = 15.681), compared to their peers not graduating (M = 56.11, SD = 15.004). This difference, -9.418, 95% CI [-11.096, -7.739] was significant t(1856) = -11.002, p < .001; with a small effect size, *d* = 0.24.

Independent t-tests were also used to compare entering financial characteristics between four-year graduates and those not graduating within four years. Students who graduated in four years entered the university with a higher EFC amounts (M =21,959.09, SD = 25,062.792), compared to their peers not graduating (M = 13,509.10, SD = 19,205.43). This difference, -8,449.99, 95% CI [-11,274.375, -5,625.610] was significant t(467.292) = -5.879, p < .001; with a small effect size, *d* = 0.26. Graduates also entered the university with a lower amount of unmet need (M = 4,902.16, SD = 6,930.71), compared to their peers not graduating (M = 6,474.07, SD = 7,380.08). This difference, 1,571.90, 95% CI [810.36, 2333.452] was significant t(692.119) = 4.053, p < .001; with a small effect size, *d* = 0.15.

Student Involvement

Chi-square analyses (Table 4.15) were used to examine whether student involvement characteristics differed between students who graduated at four years and those who did not. There were no significant differences for involvement in marching band, X^2 (1) = .001, p > .05, taking service learning courses X^2 (1) = 2.208, p > .05, working on campus X^2 (1) = .814, p > .05, and being involved in Greek life X^2 (1) = 0.063, p > .05. Marginally significant findings were noted for conduct violations X^2 (1) = 3.325, p = .068, whereby students who received a violation were less likely to graduate.

The odds of graduation were significantly higher for students who were involved in a living learning community, X^2 (1) = 8.225, p < .05, club sports X^2 (1) = 4.979, p < .05, the Honors College X^2, (1) = 56.918, p < .001, athletics X^2 (1) = 16.782, p < .001, living on campus X^2 (1) = 57.681, p < .001, and ROTC X^2 (1) = 14.303, p < .001.

Table 4.15 Cross-tabulation of 4-year graduation and student involvement

	4-year Graduation					Effect size (Cramér's	
	No	Yes	χ^2	df	P	V)	e^{β}
Conduct Violation							
No	1182	301	3.325	1	.068	0.041	0.797
Yes	363	116					1.254
Live on Campus							
No	712	106	57.681	1	.000***	0.171	0.399
Yes	833	311					2.507
Living Community							
No	1460	378	8.225	1	.004**	0.065	0.564
Yes	85	39					1.772
Honors College							
No	1504	370	56.918	1	.000***	0.170	0.215
Yes	41	47					4.660
Student Athlete							
No	1484	380	16.782	1	.000***	0.092	0.422
Yes	61	37					2.369
Marching Band							
No	1490	402	0.001	1	.971	0.001	0.989
Yes	55	15					1.011
Service Learning							
No	1320	344	2.208	1	.137	0.034	0.803
Yes	225	73					1.245
Working on Campus							
No	1432	381	.814	1	.367	0.020	0.836
Yes	113	36					1.197
Club Sports							
No	1490	392	4.979	1	.026**	0.050	.579
Yes	55	25					1.728
Greek Life							
No	1451	393	0.063	1	.802	0.006	1.061
Yes	94	24					0.943
ROTC							
No	1533	404	14.303	1	.000***	0.085	0.243
Yes	12	13					4.111

Note. *p < .05. **p < .01. ***p < .001

Chi-square analyses between recreation center use and four-year graduation (Table 4.16) showed significant relationships, indicating that students who used the recreation center on a regular basis were more likely to graduate than nonusers and infrequent users, X^2 (4) = 55.813, p < .001. As compared to non-users, the odds of graduation were higher among those who visited the recreation center 1 to 4 times per semester odds (ratio = 1.814), 5 to 15 times per semester (odds ratio = 1.883), 16 to 32 times per semester (odds ratio = 2.817), and 32 or more times per semester (odds ratio = 3.409).

Table 4.16 Cross-tabulation of four-year graduation and Recreation Center use

	4-year Graduate					Effect size	
	No	Yes	χ^2	df	P	(Cramér's V)	e^{β} [a]
Number of Visits							
0 visits	470	66	55.813	4	.000***	.169	
1-4 visits	314	80					1.814
5-15 visits	348	92					1.883
16-31 visits	225	89					2.817
32+ visits	188	90					3.409
Note. ***p < .001. a: Odds ratios compared to non-users.							

Five-year Graduates

Entering Characteristics

A chi-square analysis compared five-graduation rates and entering characteristics (Table 4.17) in order to identify significant relationships between graduates and non-graduates after five years. When comparing international students, a significant relationship was not found, X^2 (1) = .143, p = .705, V = 0.01. A significant relationship was also found when comparing residency, X^2 (1) = 105.371, p < .001, V = 0.232 with out-of-state residents having an odds ratio of 2.653 compared to in-state residents when it comes to graduating in five years. Female graduates had an odds ratio of 1.546 compared

to male graduates when comparing graduation groups X^2 (2) = 21.925, p < .001, V = 0.106. Pell eligible students were at a disadvantage compared to their peers, with an odds ratio to graduate of 0.549, X^2 (1) = 33.548, p < .001, V = 0.142.

Table 4.17 Cross-tabulation of five-year graduation and entering characteristics

	5-year Graduate					Effect size	
	No	Yes	χ^2	df	P	(Cramér's V)	e^{β}
International Student							
No	1137	774	.143	1	.705	.009	0.897
Yes	29	22					1.140
Residency							
In State	835	388	105.371	1	.000***	.232	0.377
Out of State	331	408					2.653
Gender							
Male	579	310	21.925	2	.000***	.106	0.647
Female	586	485					1.546
Pell Eligible							
No	523	433	33.548	1	.000***	.142	1.821
Yes	486	221					0.549

Note. *p < .05. **p < .01. ***p < .001

Independent t-tests were run to compare graduation rates at five years to SAT scores among graduates and non-graduates to determine if there is a significant difference in entering characteristics. On average, participants who graduated in five years entered the university with a higher SAT scores (M = 1,075.87, SD = 138.947), compared to their peers not graduating (M = 1,050.61, SD = 146.997). This difference, -25.279, 95% CI [-43.471, -27.087] was significant t(953) = -2.727 p < .01; with a small effect size, *d* = 0.087.

The independent t-test was run to compare graduation rates at four years to ACT scores among graduates and non-graduates. On average, participants who graduated in four years entered the university with a higher ACT scores (M = 23.82, SD = 3.730),

compared to their peers not graduating (M = 22.52, SD = 3.807). This difference, -1.305, 95% CI [-1.709, -.900] was significant t(1424) = -6.328, p < .001; with a small effect size, *d* = 0.165.

On average, participants who graduated in five years entered the university with a higher high school GPA (M = 3.56, SD = .339 compared to their peers not graduating (M = 3.33, SD = .371). This difference, -0.229, 95% CI [-0.261, -0.197] was significant t(1793.265) = -14.130, p < .001; with a medium effect size, *d* = 0.316.

Admission Index scores showed, on average, participants who graduated in four years entered the university with a higher Admissions index score (M = 63.31, SD = 15.229), compared to their peers not graduating (M = 54.63, SD = 14.919). This difference, -8.686, 95% CI [-10.081, -7.292] was significant t(1856) = -12.213, p < .001; with a small effect size, *d* = 0.272.

The independent t-test was run to compare graduation rates at five years to expected family contributions among graduates and non-graduates. On average, participants who graduated in four years entered the university with a higher EFC amount (M = 19,474.83, SD = 23,564.79), compared to their peers not graduating (M = 12,590.18, SD = 18,421.47). This difference, -6,884.648, 95% CI [-9,020.823, -4,748.473] was significant t(1,155.335) = -6.323, p < .001; with a small effect size, *d* = 0.18.

On average, participants who graduated in four years entered the university with a lower amount of unmet need (M = 5.372.23, SD = 7,310.67), compared to their peers not graduating (M = 6,664.10, SD = 7272.13). This difference, 1,291.87, 95% CI [634.016, 1949.726] was significant t(1960) = 3.855, p < .001; with a small effect size, *d* = 0.08.

Student Involvement

Chi-square findings failed to find significant relationships among five-year graduates (Table 4.18) and students involved in the marching band, X^2 (1) = .354, p > .05, student who took service learning courses X^2 (1) = .013, p > .05, students who worked on campus X^2 (1) = .181, p > .05, and students involved in Greek life X^2 (1) = 0.029, p > .05, and living learning community members X^2 (1) = 1.599, p > .05.

Significant findings where p < .05 level were found among students involved in ROTC, X^2 (1) = 5.765, p < .05. These students were 2.637 times more likely to graduate than non-ROTC members. Members of club sports X^2 (1) = 6.008, p < .05 were 1.742 times more likely to graduate in four years compared to their peers. Student involvement categories with significant findings where p < .001 include the Honors College X^2, (1) = 26.783, p < .001, where members were 3.139 more likely to graduate than non-members. Student athletes X^2 (1) = 38.088, p < .001, were 3.721 times more likely to graduate than their peers, and living on campus X^2 (1) = 86.731, p < .001 were 2.456 times more likely to graduate than those who did not live on campus their first semester. Finally, students who were found responsible in conduct violations members X^2 (1) = 17.126, p < .001 were 1.548 times more likely to graduate compared to those who did not receive a violation.

Table 4.18 Cross-tabulation of five-year graduation and student involvement

	5-year Graduate					Effect size	
	No	Yes	χ^2	df	P	(Cramér's V)	e^{β}
Conduct Violation							
No	920	563	17.126	1	.000***	0.093	0.646
Yes	246	233					1.548
Live on Campus							
No	586	232	86.731	1	.000***	0.210	0.407
Yes	580	564					2.456
Living Community							
No	1099	739	1.599	1	.206	0.029	0.790
Yes	67	57					1.265
Honors College							
No	1137	737	26.783	1	.000***	0.117	0.319
Yes	29	59					3.139
Student Athlete							
No	1137	727	38.088	1	.000***	0.139	0.269
Yes	29	69					3.721
Marching Band							
No	1122	770	0.354	1	.552	0.013	1.161
Yes	44	26					0.861
Service Learning							
No	988	676	.013	1	.908	0.003	1.015
Yes	178	120					.985
Working on Campus							
No	1075	738	.181	1	.671	0.010	1.077
Yes	91	58					0.928
Club Sports							
No	1129	753	6.008	1	.014*	0.055	0.574
Yes	37	43					1.742
Greek Life							
No	1095	749	0.029	1	.866	0.004	1.033
Yes	71	47					0.968
ROTC							
No	1157	780	5.765	1	.016*	0.054	0.379
Yes	9	16					2.637

Note. *p < .05. **p < .01. ***p < .001 Adjusted standardized residuals appear in parentheses below group frequencies.

The chi-square analysis between recreation center use and five year graduates was found to have significant relationships indicating that students who used the recreation center (Table 4.19) on a regular basis were more likely to graduate than nonusers and infrequent users. Chi-square findings of the Recreation Center use show significant findings X^2 (4) = 77.169, p < .001 while accounting for 19.8% of the variance. The odds ratio showed users having a higher likelihood of graduating based on use. Users who visited the recreation center 1-4 times per semester were 1.634 times more likely to graduate than non-users. Students who visited the Recreation Center 5-15 times were 1.748 more likely to graduate than non-users, users who visited the Recreation Center 16-32 times per semester were 3.282 times more likely to graduate in four years than non-users, and users who visited the Recreation Center 32 or more times in their first semester were 2.573 times more likely to graduate than their nonuser peers.

Table 4.19 Cross-tabulation of five-year graduation and Recreation Center use

Number of	5-year Graduate					Effect size	
Visits	No	Yes	χ^2	df	P	(Cramér's V)	e^{β}
0 visits	386	150	77.169	4	.000***	0.198	
1-4 visits	241	153		4			1.634
5-15 visits	262	178		4			1.748
16-31 visits	138	176		4			3.282
32+ visits	139	139		4			2.573
	(-2.0)	(2.5)					
Note. ***p < .001.							

Six-year Graduates

Entering Characteristics

A chi-square analysis compared graduation rates and entering characteristics (Table 4.20) in order to identify significant relationships between graduates and non-graduates after six years. When comparing international students, a significant

relationship was not found, X^2 (1) = .014, p = .907, V = 0.003. However, there were significant relationships among residency X^2 (1) = 81.272, p < .001, V = 0.204, with out-of-state residents having an odds ratio of 2.394 compared to in-state residents and among gender X^2 (2) = 21.976, p = < .001, V = 0.106 with an odds ratio favoring females 1.531. A significant relationship was also found in regards to Pell eligibility, X^2 (1) = 19.574, p < .001, V = 0.109 and an odds ratio of 1.560 favoring students who were not Pell eligible.

Table 4.20 Cross-tabulation of six-year graduation and entering characteristics

	6-year Graduates					Effect size (Cramér's	
	No	Yes	χ^2	df	P	V)	e^{β}
International Student							
No	990	921	0.14	1	.907	.003	0.968
Yes	26	25					1.034
Residency							
In State	730	483	81.272	1	.000***	.204	0.418
Out of State	286	453					2.394
Gender							
Male	512	377	21.976	2	.000***	.106	0.652
Female	503	568					1.534
Pell Eligible							
No	460	496	19.574	1	.000***	.109	1.560
Yes	418	289					0.641

Note. *p < .05. **p < .01. ***p < .001

The independent t-test was run to compare graduation rates at six years to SAT scores among graduates and non-graduates. On average, participants who graduated in six years entered the university with a higher SAT scores (M = 1072.29, SD = 142.740), compared to their peers not graduating (M = 1050.90, SD = 144.056). This difference, -21.388, 95% CI [-39.716, -3.061] was significant t(953) = -2.290, p < .05 with a small effect size, d = 0.07.

On average, participants who graduated in six years entered the university with a higher ACT scores (M = 23.53, SD = 3.827), compared to their peers not graduating (M = 22.57, SD = 3.778). This difference, -0.963, 95% CI [-1.359, -0.567] was significant t(1424) = -4.769, p < .001; with a small effect size, *d* = 0.12.

On average, participants who were graduated in six years entered the university with a higher entering high school GPA scores (M = 3.54, SD = .345), compared to their peers not graduating (M = 3.32, SD = .366). This difference, -0.227, 95% CI [-0.259, -0.195] was significant t(1928) = -13.993, p < .001; with a medium effect size, *d* = 0.303.

An independent t-test was run to compare graduation rates at six years to Admission index scores among graduates and non-graduates. On average, participants who graduated in six years entered the university with a higher Admissions index scores (M = 62.50, SD = 15.545), compared to their peers not graduating (M = 54.10, SD = 14.604). This difference, -8.403, 95% CI [-9.778, -7.028] was significant t(1820.444) = -11.985, p < .001; with a small effect size, *d* = 0.27.

The independent t-test was run to compare graduation rates at six years to expected family contributions among graduates and non-graduates. On average, participants who graduated in six years entered the university with a higher EFC amounts (M = 18,394.21, SD = 23,189.99), compared to their peers not graduating (M = 12,529.12, SD = 18,109.35). This difference, -5,865, 95% CI [-7,883.300, -3,846.882] was significant t(1478.952) = -5.700, p < .001; with a small effect size, *d* = 0.14.

The independent t-test was run to compare graduation rates at six years to unmet financial need values among graduates and non-graduates. On average, participants who were graduated in six years entered the university with a lower amount of unmet need (M

= 5,348.80, SD = 7,147.53), compared to their peers not graduating (M = 6,876.652, SD = 7,392.44). This difference, 1,527.84, 95% CI [883.964, 2171.733] was significant t(1957.212) = 4.654, p < .001; with a small effect size, *d* = 0.10.

Student Involvement

Chi-square findings among student involvement and six-year graduation rates (Table 4.21) did not find significant relationships among six-year graduates and students involved in the marching band, X^2 (1) = .835, p > .05, student who took service learning courses X^2 (1) = .448, p > .05, students who worked on campus X^2 (1) = .039, p > .05, and students involved in Greek life X^2 (1) = 0.000, p > .05, living learning community members X^2 (1) = 1.330, p > .05, ROTC members X^2 (1) = 2.527, p > .05 or students involved in Club Sports X^2 (1) = 2.879, p >.05.

Significant findings were found among students receiving conduct violations X^2, (1) = 10.661, p < .05 were 1.410 times more likely to graduate than their peers. Student involvement categories with significant findings where p < .001 include the Honors College X^2, (1) = 31.154, p < .001, where members were 3.857 more likely to graduate than non-members. Student athletes X^2 (1) = 28.519, p < .001, were 3.315 times more likely to graduate than their peers, and living on campus X^2 (1) = 59.827, p < .001 were 2.052 times more likely to graduate than those who did not live on campus their first semester.

Table 4.21 Cross-tabulation of six-year graduation and student involvement

	6-year Graduate					Effect size	
	No	Yes	χ^2	df	P	(Cramér's V)	e^{β}
Conduct Violation							
No	799	684	10.661	1	.001**	0.074	0.709
Yes	217	262					1.410
Live on Campus							
No	508	310	59.827	1	.000***	0.175	0.487
Yes	508	636					2.052
Living Community							
No	958	880	1.330	1	.249	0.026	0.807
Yes	58	66					1.239
Honors College							
No	996	878	31.154	1	.000***	0.126	0.259
Yes	20	68					3.857
Student Athlete							
No	991	873	28.519	1	.000***	0.121	0.302
Yes	25	73					3.315
Marching Band							
No	976	916	0.835	1	0.361	0.021	1.251
Yes	40	30					0.799
Service Learning							
No	867	797	.448	1	0.503	0.015	1.088
Yes	149	149					1.088
Working on Campus							
No	940	873	.039	1	0.843	0.004	0.967
Yes	76	73					1.034
Club Sports							
No	982	900	2.879	1	0.090	0.038	0.677
Yes	34	46					1.476
Greek Life							
No	955	889	0.0	1	0.984	0.000	0.996
Yes	61	57					1.004
ROTC							
No	1007	780	2.527	1	0.112	0.036	0.436
Yes	9	16					2.295

Note. *p < .05. **p < .01. ***p < .001

The chi-square analysis between recreation center use and six-year graduates (Table 4.22) was found to have significant relationships indicating that students who used the recreation center on a regular basis were more likely to graduate than nonusers and infrequent users. Chi-square findings of the Recreation Center use show significant findings X^2 (4) = 53.442, p < .001 while accounting for 16.5% of the variance. The odds ratio showed users having a higher likelihood of graduating based on use. Users who visited the recreation center 1-4 times per semester were 1.282 times more likely to graduate than non-users. Students who visited the Recreation Center 5-15 times were 1.319 more likely to graduate than non-users, users who visited the Recreation Center 16-32 times per semester were 2.665 times more likely to graduate in four years than non-users, and users who visited the Recreation Center 32+ times in their first semester were 1.913 times more likely to graduate than their nonuser peers.

Table 4.22 Cross-tabulation of six-year graduation and Recreation Center use

	6 year Graduate						
	No	Yes	χ^2	df	P	Effect size (Cramér's V)	e^{β} [a]
Number of Visits							
0 visits	325	211	53.442	4	.000***	0.165	
1-4 visits	215	179					1.282
5-15 visits	237	203					1.319
16-31 visits	115	199					2.665
32+ visits	124	154					1.913
	(-1.7)	(1.7)					

Note. ***p < .001. a: Odds ratios compared to non-users.

Regression Analyses: Multivariable Tests of Relationships Predicting Retention and Graduation

A series of logistic regression analyses was conducted to allow for multiple variables to be simultaneously considered as predictors of specific outcomes such as retention or graduation. Logistic regression with a Forward (LR) method was used to determine what factors impact outcomes. The five outcomes considered here include: 1) retention to spring semester; 2) retention to the second year; 3) graduation at four years; 4) graduation at five years; and 5) graduation at six years. All students' entering characteristics and involvement variable, and fall GPA, were included in every model; those that were significant at $p<.05$ are shown in the tables in this section.

Beginning with the outcome of retention to spring semester (Table 4.23), significant predictors included students' entering characteristics (in-state residence status, financial need), involvement (Recreation Center use), and fall GPA. Students who were in the highest two categories of unmet financial need (both had need more than the cost of tuition) were less likely to be retained to the spring semester, while out-of-state students, students with higher fall GPAs, and Pell eligible students were more likely to be retained to the spring semester.

Table 4.23 Results of logistic regression model to predict retention to spring semester

Predictor	B	SEβ	Wald's χ^2	*df*	*P*	e^{β}
Constant	.943	.249	14.371	1	.000***	2.568
Pell Eligible (0 = No, 1 = Yes)	.791	.225	12.322	1	.000***	2.206
Fall GPA (0.0 – 4.0)	.770	.084	84.530	1	.000***	2.160
Conduct violation (0 = No, 1 = Yes)	.673	.284	5.604	1	.018*	1.960
Rec Center visits (0 visits)	-.654	.208	9.900	1	.002**	.781
Unmet financial need ($7,500-$14,999)	-1.682	.230	53.658	1	.000***	.292
Unmet Financial need ($15,000-$22,500)	-2.869	.417	47.237	1	.000***	.057

Note. *p < .05. **p < .01. ***p < .001. N = 1617. R^2 = .137 (Cox & Snell), .298 (Nagelkerke)

The logistic model passed the assumption of multicollinearity with a maximum VIF score ranging from a low of 1.022 (Greek Life) to a high VIF score of 2.798 (Pell Eligible). All results for collinearity tolerance was above the 0.1 threshold, with Pell eligible variable reporting the lowest collinearity tolerance score (0.357).

The next logistic regression analysis (Table 4.24) considered retention to the second year of school. Similar to the second semester retention, students with higher Fall GPA, and students who participated in the conduct process continued to be retained at higher levels. Newly entered into the model, students who were athletes, and students who visited the Recreation Center on average 1-2 times a week were more likely to be retained to their second year. Meanwhile, students with higher unmet need continued were less likely to be retained. Newly significant in this model (as compared to the model predicting second semester retention) was a group whose Expected Financial

Contributions fell between 80% to 100% of the cost of attendance, indicating the impact of financial security on retention rates.

Table 4.24 Results of logistic regression model to predict retention to second year

Predictor	β	SEβ	Wald's χ^2	*df*	*P*	e^{β}
Constant	-1.583	.175	81.960	1	.000***	.205
Fall GPA (0.0 – 4.0)	.970	.063	236.672	1	.000***	2.637
Student Athlete (0 = No, 1 = Yes)	.814	.418	3.794	1	.051	2.256
Conduct Violation (0 = No, 1 = Yes)	.676	.163	17.216	1	.000***	2.706
Rec Center visits (16-31 visits)	.586	.194	9.095	1	.003**	1.797
80-100% EFC/COA	-.814	.235	12.028	1	.001**	.443
Unmet financial need ($7,500-$14,999)	-.677	.157	18.671	1	.000***	.508
Unmet financial need ($15,000-$22,500)	-.946	.381	6.175	1	.013*	.184

Note. *p < .05. **p < .01. ***p < .001. N = 1617. R^2 = .223 (Cox & Snell), .317 (Nagelkerke)

Like the previous regression model, this model also passed the assumption of collinearity with a maximum VIF score ranging from a low of 1.013 (marching band) to a high VIF score of 1.764 (Pell eligible). All results were also above the collinearity tolerance 0.1 threshold with the lowest collinearity tolerance score of 0.526 (housing).

The next logistic regression model predicted four-year graduation rates (Table 4.25). Using the forward stepwise (LR) model, results revealed that a mix of entering characteristics and involvement were significant predictors of four-year graduation rates.

Table 4.25 Results of logistic regression model to predict graduation status at four years

Predictor	β	SEβ	Wald's χ^2	*df*	*P*	e^{β}
Constant	-5.376	.437	151.527	1	.000	.005
Admissions Index (0-100 scale)	.012	.005	4.894	1	.027*	1.012
In-State Resident (0 = No, 1 = Yes)	-.982	.143	47.251	1	.000***	.375
Male (0 = No, 1 = Yes)	-.411	.148	7.768	1	.005**	.663
Fall GPA (0.0 - 4.0 scale)	1.272	.129	97.114	1	.000***	4.594
ROTC (0 = No, 1 = Yes)	2.364	.539	19.265	1	.000***	30.552
Honors College (0 = No, 1 = Yes)	.551	.275	4.008	1	.045*	2.975
Rec Center 16-31 visits	.498	.187	7.101	1	.008**	1.646

Note. *p < .05. **p < .01. ***p < .001. N = 1617. R^2 = .211 (Cox & Snell), .328 (Nagelkerke)

Students more likely to graduate in four years include students with higher Admission Index scores, students earning higher first semester fall GPA, members in ROTC, members of the Honors College, females, out-of-state students, and students who used the Recreation Center between 1-2 times a week during their first semester. Students less likely to graduate in four years include male students and in-state residents. This model had an R^2 score (Cox and Snell) of 0.211. The four-year graduation logistic regression model passed the assumption of multicollinearity with VIF scores range from a low of 1.013 (Matching Band) to a high score of 1.902 (Housing). The multicollinearity tolerance score had the lowest tolerance rating of .526 (Housing).

The five-year graduation logistic regression model (Table 4.26) had similar results to the four-year graduation model. The odds of graduation were slightly reduced

for all categories and a new form of involvement was included in the final model, which included students' athletic involvement as a significant predictor of graduation. Those students had 3.942 times greater chance of graduating in five years compared to their peers. This model yielded an R^2 score (Cox and Snell) of 0.261.

Table 4.26 Results of logistic regression model to predict graduation status at five years

Predictor	β	SEβ	Wald's χ^2	*df*	*P*	e^{β}
Constant	-4.231	.335	159.394	1	.000	.015
Admissions Index (0 – 100 scale)	.011	.004	6.467	1	.011*	1.011
In-State Resident (0 = No, 1 = Yes)	-.494	.147	11.345	1	.001**	.610
Male (0 = No, 1 = Yes)	-.300	.123	5.962	1	.015*	.741
Fall GPA (0.0 – 4.0 scale)	1.116	.089	159.592	1	.000***	3.052
ROTC (0 = No, 1 = Yes)	1.937	.545	12.645	1	.000***	6.935
Student Athlete (0 = No, 1 = Yes)	.783	.300	6.788	1	.009**	3.942
Honors College (0 = No, 1 = Yes)	.389	.147	6.996	1	.008**	1.475
Rec Center 16-31 visits	.383	.163	5.520	1	.000***	1.015
Note. *p < .05. **p < .01. ***p < .001. N = 1617. R^2 = .261 (Cox & Snell), .354 (Nagelkerke)						

The five-year logistic regression model also passed the multicollinearity test with multicollinearity with VIF scores range from a low of 1.013 (marching band) to a high score of 1.902 (living on-campus). The multicollinearity tolerance score had the lowest tolerance rating of .526 (living on-campus).

The logistic regression to predict six-year graduation rates (Table 4.27) continued to indicate higher odds of graduation among students who were out-of-state, female, had

higher first semester GPAs, were members of ROTC and student athletes, and used the Recreation Center 1-2 times a week. Honors College involvement was no longer significant in the model, but first year unmet financial need emerged as a significant predictor, with students who had no unmet need during their first year being 1.328 times more likely to graduate than their peers. The model also showed that male students and in-state residents were less likely to graduate than their peers. The model explained 27.4% (Cox and Snell) of the variance in the outcome.

Table 4.27 Results of logistic regression model to predict graduation status at six years

Predictor	β	SEβ	Wald's χ^2	*df*	*P*	e^{β}
Constant	-3.379	.262	166.090	1	.000	.034
In-State Resident (0 = No, 1 = Yes)	-.430	.131	6.168	1	.001**	.651
Male (0 = No, 1 = Yes)	-.298	.120	6.168	1	.013*	.742
Fall GPA (0.0 – 4.0 scale)	1.230	.076	231.684	1	.000***	3.421
ROTC (0 = No, 1 = Yes)	1.422	.543	6.854	1	.009**	4.144
Student Athlete (0 = No, 1 = Yes)	.698	.311	5.041	1	.025*	3.694
Rec Center 16-31 visits	.461	.163	7.976	1	.005**	1.586
Unmet Financial Need (Zero)	.284	.122	5.391	1	.020*	1.328
Note. *p < .05. **p < .01. ***p < .001. N = 1617. R^2 = .274 (Cox & Snell), .365 (Nagelkerke)						

The six-year logistic regression model also passed the multicollinearity test with VIF scores range from a low of 1.013 (marching band) to a high score of 1.902 (Living on-campus). The multicollinearity tolerance score had the lowest tolerance rating of .526 (Living on-campus).

Table 4.28 provides a summary of significant findings for the logistic regression of student involvement and entering characteristics against the academic outcomes of retention and graduation. Fall GPA and participation in the conduct process are the positive contributors for both first semester and first year retention while the highest levels of unmet financial need ($7,500-$14,999 and $15,000-$22,500) were consistent negative factors to both first semester and first year retention.

First semester GPA, Recreation Center (16-31 visits), ROTC were positive significant factors across four, five, and six year graduation years while in-state residents and males were negative significant factors across four, five, and six year graduation years.

Table 4.28 Summary of significant logistic regression findings and academic outcomes

Predictor	First sem. ret. B	P	e^{β}	First year ret. B	P	e^{β}	Four Year Grad. B	P	e^{β}	Five Year Grad. B	P	e^{β}	Six Year Grad. B	P	e^{β}
Pell Eligible	.791	.000***	2.568	-	-	-	-	-	-	-	-	-	-	-	-
Unmet Financial need ($7,500-$14,999)	-1.698	.000***	.292	-.677	.000***	.508	-	-	-	-	-	-	-	-	-
Unmet Financial need ($15,000-$22,500)	-2.869	.000***	.057	-.946	.013*	.184	-	-	-	-	-	-	-	-	-
80-100% EFC/COA	-	-	-	-.814	.001**	.443	-	-	-	-	-	-	-	-	-
Unmet Financial Need ($0)	-	-	-	-	-	-	-	-	-	-	-	-	.284	.020*	1.328
Admission Index	-	-	-	-	-	-	.012	.027*	1.012	.011	.011*	1.011	-	-	-
In state Resident	-	-	-	-	-	-	-.982	.000***	.375	-.494	.001**	.610	-.430	.001**	.651
Male	-	-	-	-	-	-	-.411	.005**	.663	-.300	.015*	.741	-.298	.013*	.742
Fall GPA	.770	.000***	2.206	.970	.000***	2.637	1.272	.000***	4.594	1.116	.000***	3.052	1.230	.000***	3.421
Rec Center (0 visits)	-.654	.002**	.781	-	-	-	-	-	-	-	-	-	-	-	-

Conduct Process	.673	.018*	1.960	.676	.000***	2.706	-	-	-	-	-	-	-	-	-
Athlete	-	-	-	.814	.000***	2.256	-	-	-	.783	.009**	3.942	.698	.025*	3.694
Rec Center (16-31 visits)	-	-	-	.586	.003*	1.797	.498	.008**	1.646	.383	.000***	1.015	.461	.005**	1.586
ROTC	-	-	-	-	-	-	2.364	.000***	30.55	1.937	.000**	6.935	1.422	.009**	3.421
Honors College	-	-	-	-	-	-	.551	.045*	2.975	.389	.008**	1.475	-	-	-
Note. *p < .05. **p < .01. ***p < .001. N = 1617.															

Involvement Index

Finally, in an effort to simultaneously examine the combined contributions of various types of student involvement to explaining student graduation outcomes, an Involvement Index was created. This index was utilized to predict six-year graduation rates (Table 4.29). First, student involvement was explored to determine how many students were involved in different opportunities on campus. Among the 1962 students in the sample, involvement scores ranged from zero to 6 activities, considering any of the X possible activities assessed in this study (i.e., ROTC, Honors College, athletics) during their first semester. As shown in Table 4.26, the percentage of students graduating in 6 years was lower among students with less involvement: among the 310 students involved in zero activities, only 118 (38.1%) graduated from the university after six years. Graduation rates for students who had zero, one, or two types of involvement were below the overall six-year graduation rate for the entering cohort of 2012, which was 48.3% overall. Graduation rates of students with three, four, or five types of involvement during their first semester, were all higher than 55%. Interestingly, those with 6 types of involvement had much lower graduation rates, but with only 5 students in this group the findings are unstable and should be interpreted with caution.

Table 4.29 Total student involvement and six-year graduation rates

Involvement categories	Six-year graduation No	%	Six- year graduation Yes	%	Total
0 involvement	192	61.9	118	38.1	310
1 involvement	252	65.3	135	34.9	387
2 Involvement	245	52.5	221	47.5	466
3 Involvement	194	40	291	60	485
4 Involvement	104	41.6	146	58.4	250
5 Involvement	26	44	33	56	59
6 involvement	3	60	2	40	5
Total (N = 1962)	1016	51.7	946	48.3	1962

This Student Involvement Index (SII) was created to determine whether higher levels of involvement predicted six-year graduation rates. The index includes a student involvement score compared to a maximized involvement indicator in order to predict whether a student would graduate from the university. The sample was then applied to the model to determine the efficacy of the model.

The student involvement score includes a β weight multiplied against an involvement category (0,1) depending on whether a student participated in that specific form of involvement. If a student was not a participant, they received a '0' in that category of involvement. If a student was a participant, they received a '1' as their score. A weighted beta score was assigned as a starting point to each level of involvement based on level of impact found during the regression analysis. After assigning a weighted β

score to each form of involvement, the sum of the scores were totaled to create a total student involvement score. The student involvement score formula is as follows:

Student Involvement Score = [β_1(Involvement 1) + β_2(Involvement 2) + β_3(Involvement 3) + …]

Next, the researcher created a maximized indicator. This maximized involvement indicator is a theoretical cutoff created by the researcher to determine where graduates and non-graduates should fall based on their level of involvement during their first semester. Theoretically, students above the maximized involvement indicator should be graduates of the university while students who fall below the maximized involvement indicator should be non-graduates. This theoretical assignment was then compared to the student's actual graduation status to determine whether the model made an accurate prediction or not. If the model made a correct prediction, the student was assigned a 'zero', and if the prediction did not match, the student was assigned the score of 'one'. This total overall score was called the Predictive Power Score. Within this student involvement index, the lower the predictive power score, the more accurate the model.

This total involvement score was analyzed for normality prior to analysis. Due to the high number of students who were not involved in any of these forms of student involvement, normality could not be established. Therefore, analyses predicting graduation rates were conducted both with and without non-involved students in the model.

For a baseline analysis, the researcher began with every involvement score weighted equally ($\beta = 1$) for all forms of involvement and a predictive score of zero (Table 4.30). The model correctly predicted 48.2% of the students' graduation status

including the students who had zero involvement during their first semester. With the removal of these students, the model increased to 50.1% correct. As the predictive involvement score was modified, the model further increased, to 59.1% predictions correct for involvement, and 58.6% correct for the sample size when the predictive involvement score was set at three.

Table 4.30 Predictive involvement index

Maximized Involvement Indicator	Predictive Power Score	Correct Matches (N = 1962)	Percent Correct	Predictive Power Score	Matches (N = 1652)	Percent Correct
0	1016	946	48.2	824	828	50.1
1	942	1020	51.9	824	828	50.1
2	825	1137	57.9	707	945	57.2
3	801	1161	59.1	683	969	58.6
4	898	1064	54.2	780	872	52.7
5	940	1022	52.0	822	830	50.2
6	947	1015	51.7	947	705	42.6
Sample size including all students, N = 1962; Sample size with removal of uninvolved students, N = 1652, $\beta = 1$						

After determining that the unweighted involvement index correctly predicted 59.1% (N=1962) and 58.6% (N = 1652) of the sample, a weighting was added to the different forms of involvement to create a new involvement index. This weighting allowed a wider distribution of involvement scores, which in turn, increased the accuracy of the prediction model. The first starting point to weight the index was to use the odds ratio as a weighted score and explore various values of involvement to determine the best

cutoff point. Using this model (Table 4.31) as a starting point allowed the prediction to increase to 61.8% (N=1962) and 62.2% (N = 1653), for the final model.

Using this model, the following weights were assigned to each level of student involvement: 1) Conduct violations, 1.4; 2) On-campus housing, 2.5; 3) Living learning communities, 0.6; 4) Honors College, 3; 5) Athletics, 2.9; 6) Marching band, 0.4; 7) Service- learning course, 0.7; 8) working on-campus, 1.2; 9) Recreation Center visits (1-4), 0.5; 10) Recreation Center visits (5-15), .9; 11) Recreation Center visits (16-31), 1.8; 12) Recreation Center visits (32+), 1.9; 13) Club sports, 2; 14) Greek life, 0.6; and 15) ROTC, 2.4.

Table 4.31 Weighted predictive involvement index

Maximized Involvement Indicator	Involvement Index Score	N	Correct Prediction	Percent Correct
4.2	0	310	192	62
4.2	0.1 – 2.0	428	278	65
4.2	2.1 – 4.1	358	212	59
4.2	4.2 – 4.9	287	168	59
4.2	5.0 – 5.9	290	174	60
4.2	6.0 – 10.8	289	190	66
Sample size including all students, N = 1962				

After 636 iterations, the best-fit model found that 1,096 students fell below the maximized involvement indicator. The model correctly predicted that 682 (62%) of those students would not graduate from the university, while 414 (38%) of those predicted not to graduate did in fact graduate from the university. A total of 866 students were above the maximized involvement indicator. The model correctly predicted that

532 (61%) of those students would graduate after six years at the university, while 334 (39%) were predicted to graduate did not in fact graduate from the university after six years.

CHAPTER FIVE: DISCUSSION

For universities and students alike, graduation is a key indicator of a student's successful academic progress. Understanding the characteristics and factors affecting students both positively and negatively on their way to graduation is imperative for a university looking to increase both retention and graduation rates. Throughout this study, entering characteristics (e.g. such as high school academic performance, residency, financial need, etc.) were considered in addition to exploring the impact of first semester student involvement on GPA, retention, and graduation. If one considers the timeline of a student, students enter the university with certain characteristics, then choose and participate (or not) in different forms of student involvement during their first semester prior to earning their first semester GPA (most commonly, during the fall semester for those who follow a typical enrollment pattern). After earning their fall GPA, students must decide whether to return to the university the following semester, the following year, and eventually, whether to continue to graduation or to leave the university. Therefore, understanding the impact of student involvement (while considering entering characteristics) on first semester GPA, first semester retention, first year retention, and graduation provides an opportunity for intervention and support.

This study began by exploring how entering characteristics affected students' first semester GPA. Correlations indicated that students who earned higher GPAs in their first semester also had higher entering high school GPAs (.570) and Admissions Index scores(.535), but a negative correlation was noted between first semester GPA and unmet

financial need (-.166). Similar to previous research (Stewart, et al, 2015), the best entering predictor of first semester (college) GPA is academic performance (GPA) from high school, while one of the largest barriers to earning a strong GPA during freshman year is unmet financial need.

Next, the study looked at how independent student involvement affects first semester GPA. Students involved in the Honors College, athletics, working on-campus, service-learning courses, and living on-campus all had significantly higher fall GPAs than their peers. One must consider that two forms of these involvements are competitive and select members based on performance (academics and athletics), while working on-campus, service-learning courses, and living on-campus do not have competitive selection processes (based on performance prior to entering university) and were open to all students. This might mean that students who self-select to apply to these programs have dispositions different from the general student population. However, this also shows a variety of other involvement (work on- campus, service learning, and living on-campus) where participants have significantly higher first semester GPAs compared to their peers.

Evaluation of Recreation Center usage showed that users of the Recreation Center had higher first semester GPAs. Students who used the recreation center one to two times a week had significantly higher GPAs (2.94), as well as students who used the Recreation Center more than two times a week (2.94 GPA) as compared to non-users (2.40 GPA) and low-frequency users (2.59 GPA). This effect size was medium (d = .55) and suggests that encouraging students to regularly use the Recreation Center might positively impact their GPA during their first semester.

Upon completion of their first semester, students must decide whether to return to the university the following semester. Students returned to the second semester at a rate of 90.8% (N = 1781). The study found that students who were retained to the spring semester had a significantly higher fall GPA (M = 2.78) compared to their peers (M = 1.62, $p < .001$). This was a medium effect ($d = .62$) on retention rates between first and second semester. This was the strongest predictor of retention among all possible factors while standing on its own and was the second strongest factor when combined in the multivariable logistic regression model which considered all factors at the same time. Other significant predictors in the logistic model included Pell eligibility and whether students had received a conduct violation through the Dean of Students. Pell eligibility was negatively associated with retention, which is interesting because students who were in the two largest categories of unmet financial need (both above the cost of tuition) were less likely to continue to second semester. This might be due to Pell eligible students receiving financial assistance, thus dropping their unmet need into a different category, while students who fall outside of the Pell eligibility are placed at risk because they did not receive financial assistance, and thus have higher unmet financial need. Unmet financial need had a medium effect ($d = .51$) on retention ($p < .001$), with an average unmet need difference of $5,572.41 between students retained and not retained, indicating that finances play a significant role in retention to the second semester. This gap suggests further research might be necessary to explore financial supports to increase retention for such students.

Retention to the following fall semester dropped to 71.5% (N = 1402) of the starting cohort of students. This means between the second and third semester the

university lost 379 students in addition to the 181 students lost between the first and second semester. First semester GPA had a medium effect (d = .56) on retention rates between the first and second year. Students who were retained to the following fall semester earned a significantly higher first semester GPA (M = 2.98) compared to their peers (M = 1.91, $p < .001$), continuing to show the importance first semester GPA has on retention rates as a high number of students dropped out or transferred after their first year. This is similar to work done by (Zwick & Sklar, 2005).

Similarly, some entering characteristics were shown to significantly affect second year retention. The odds of being retained were higher for international students, out-of-state residents, and females, and for those not eligible for Pell support. In terms of involvement characteristics, students who lived on campus, were involved in athletics or the Honors College, participated in a service-learning course, and used the Recreation Center were all retained at higher levels than their peers. This suggests that a variety of student involvement opportunities positively affects retention rates on campus.

Overall, a total of 946 out of 1,962 students (48.2%) graduated within six years of enrolling during the fall 2012 semester. Those 946 six-year graduates made up 67.4% of the 1,402 students retained to their second year at the university. Understanding the entering characteristics of these graduates and what factors might help them reach graduation is important in university policy making. This includes the need for greater understanding of what and how outside the classroom student involvement influences students' success inside the classroom.

Six-year graduates, on average, earned a higher GPA during their first semester (M = 3.22) compared to those not graduating in six years (M = 2.17). This result

continues to highlight the importance of earning a high GPA during the first semester of college, as found in previous research (Gayles, 2012; Stewart et al, 2015). Results from the current study show that entry characteristics (high school GPA, Admissions Index, lower amounts of unmet financial need) can be used as predictors for graduation. These characteristics may be used during the admissions process for selecting students to attend the university, but more importantly, they are significant indicators that certain efforts may increase retention. For example, student involvement on campus helps to increase first semester GPA as well as six-year graduation rates, and thus having university administrators focus on ensuring sufficient opportunities for students to get involved in their first semester is important, as is the encouragement for students to choose to engage in those opportunities to become involved in campus life.

The Student Involvement Index created for this study is a tool that can be used to help predict graduation rates based on cumulative first semester student involvement. The Student Involvement Index, using weighted involvement scores, accurately predicted whether students would graduate or not for 61.8% (N = 1962) of the population, and 62.1% (N = 1652) of all students involved in at least one form of involvement during their first semester at the university. This tool might help universities decide where to place their financial support and encouragement of student participation when students arrive at the university. It also allows universities to explore the student experience within different forms of involvement to identify high-impact involvement opportunities that may be more effective in helping students reach greater academic success within the classroom. This is consistent with previous research suggesting that a variety of

opportunities is important, and some specific form may be particularly valuable (Astin, 1993; Haussmann et al., 2009, Kilgo et al, 2015; Kuh, 2008).

Strengths and Limitations

Strengths

1. Using a logistic model, the study was able to analyze both continuous and nominal predictors while accounting for entering characteristics.

2. The study considered an inclusive look at student involvement and their interactions rather than focus on the impact of one program which fails to consider the possible impact of other university involvement.

3. This study continued to build knowledge about existing student development theories and whether they are relevant to more recent populations of college students.

4. The study could help determine whether certain student involvement programs should receive more support as a way to increase graduation rates.

5. The study can help increase the prediction of graduation rates based on student existing data points.

Limitations

1. Research was limited to one class of freshman and might not be generalizable to the institution and/or other institutions.

2. Recorded data might not be accurate due to human data entry or transfer error.

3. This study did not include an understanding of how students qualitatively felt about their involvement in order to help weight the impact of involvement as a predictor.

4. There is a lack of understanding about what barriers affect student participation.

5. Data were not collected as to the reasons why students did not graduate (i.e. drop out, transfer, degree still in progress, etc.)

6. Student involvement during the first semester was limited to on-campus involvement where students might be involved in other forms of involvement (religious, off-campus work, internships, etc.)

7. The most accurate model (Appendix A) was able to predict 62.0% (N=1962) and 62.1% (N=1652), respectively, however, the researcher does not feel comfortable using this model in the future, as the model requires the prediction that 100% of students who are members of the Honors College will graduate within six years due to the β score of Honors College membership being equal to the predictive indicator. This researcher does not feel comfortable with such a claim, since such a result is outside the realm of probability.

Conclusion

This study found both a direct and indirect relationships between first semester student involvement and graduation rates of students. Students involved in ROTC, Athletics, and the Recreation Center during their first semester had greater odds of graduating within six years than did their peers who did not engage in such activities. Collectively, students engaged in several different activities during their first semester also had higher rates of graduation than their peers. The Student Involvement Index weighting helps explain the combined effect of students' involvement and highlights the importance of considering both the quantity and the quality of types of involvement, rather than a comparison between one form of involvement or another.

Student involvement's association with graduation rates appears to occur through an effect on first semester GPA. Because GPA is still one of the best predictors of graduation, increasing GPA during the first semester of college could be a focal point for the university. This study found that first semester GPA is significantly impacted by different forms of student involvement, thus encouraging and recruiting students to get involved might be a strategy to assist students in raising their first semester GPA. Opportunities to work on campus were one of the types of involvement considered in this study, and such involvement may not only assist with retention outcomes, while also addressing the gap of unmet financial need for some students.

Future research could include applying another cohort (at this university or another) to the Student Involvement Index to test its predictive power. This would also increase the ability to generalize the model for use at other universities. Using a weighted scale could help universities understand the efficacy of their student involvement offices and whether or not they are helping academic outcomes such as retention and graduation. Using empirical research might serve as encouragement for students and parents when choosing where and how to get involved on campus during the first year of college.

Future research should also consider the barriers that prevent students from becoming involved on-campus. Identifying and understanding the barriers could help universities explore solutions to better support students on their journey of earning a college degree. Removing these barriers might increase student involvement which, in turn, could raise student GPA and retention rates. Attracting students to different types of

involvement could lead to higher retention, and in turn, graduation rates across the university.

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APPENDIX A

Results from Student Involvement Index

Table A.1 Results from Student Involvement Index

Cond.	live on	LLC	Hon.	Athl.	Band	Serv. Learn.	Work On Camp	1-4 rec visits	5-15 rec visits	16-31 rec visits	32 + Rec visits	Club Sports	Greek Life	ROTC	Max Invol. Indicator	Pred. Power (N = 1962)	Percent Correct	Pred. Power (N = 1652)	Correct Percent
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1016	48.22%	824	50.12%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	942	51.99%	824	50.12%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	825	57.95%	707	57.20%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	801	59.17%	683	58.66%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	898	54.23%	780	52.78%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	940	52.09%	822	50.24%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	947	51.73%	947	42.68%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	2	840	57.19%	722	56.30%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	3	799	59.28%	681	58.78%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	4	765	61.01%	647	60.84%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	5	793	59.58%	675	59.14%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	4.5	763	61.11%	645	60.96%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	4.4	761	61.21%	643	61.08%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	4.3	763	61.11%	645	60.96%
1.4	2.5	1	3.8	3.3	0.79	1.01	1.03	1.2	1.7	2.8	1.9	1.4	1	2.2	4.3	765	61.01%	647	60.84%
1.4	2.5	1	3.8	3.3	0.79	1.01	1.03	1.2	1.7	2.8	1.9	1.4	1	2.2	4.4	764	61.06%	646	60.90%

1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	901	54.08%	783	52.60%
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	818	58.31%	700	57.63%
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	819	58.26%	701	57.57%
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	900	54.13%	782	52.66%
0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	938	52.19%	820	50.36%
1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	885	54.89%	767	53.57%
1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	954	51.38%	836	49.39%
1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	819	58.26%	701	57.57%
1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	884	54.94%	766	53.63%
1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	954	51.38%	836	49.39%
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	898	54.23%	780	52.78%
0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	894	54.43%	776	53.03%
0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	942	51.99%	824	50.12%
0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	813	58.56%	695	57.93%
0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	903	53.98%	785	52.48%
0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	813	58.56%	695	57.93%
0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2	899	54.18%	781	52.72%
0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3	942	51.99%	824	50.12%
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	869	55.71%	751	54.54%
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	930	52.60%	812	50.85%
1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	857	56.32%	739	55.27%
1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	934	52.40%	816	50.61%
1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	3	946	51.78%	828	49.88%
1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	816	58.41%	698	57.75%
1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	869	55.71%	751	54.54%
1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	3	932	52.50%	814	50.73%
1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	816	58.41%	698	57.75%
1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2	857	56.32%	739	55.27%

1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3	936	52.29%	818	50.48%
1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	4	946	51.78%	828	49.88%
0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	898	54.23%	780	52.78%
0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	850	56.68%	732	55.69%
0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	946	51.78%	828	49.88%
0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	846	56.88%	728	55.93%
0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2	942	51.99%	824	50.12%
0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	3	946	51.78%	828	49.88%
0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	812	58.61%	694	57.99%
0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	2	856	56.37%	738	55.33%
0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	812	58.61%	694	57.99%
0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	852	56.57%	734	55.57%
1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	871	55.61%	753	54.42%
1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	928	52.70%	810	50.97%
1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	839	57.24%	721	56.36%
1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	912	53.52%	794	51.94%
1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	827	57.85%	709	57.08%
1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2	916	53.31%	798	51.69%
1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	3	946	51.78%	828	49.88%
1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	815	58.46%	697	57.81%
1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	2	840	57.19%	722	56.30%
1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	715	63.56%	697	57.81%
1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	828	57.80%	710	57.02%
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	956	51.27%	838	49.27%
0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	908	53.72%	790	52.18%
0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	946	51.78%	828	49.88%
0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	859	56.22%	741	55.15%
0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	2	947	51.73%	829	49.82%

0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	856	56.37%	738	55.33%
0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	2	942	51.99%	824	50.12%
0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	825	57.95%	707	57.20%
0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	2	853	56.52%	735	55.51%
0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	825	57.95%	707	57.20%
0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	2	850	56.68%	732	55.69%
1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	907	53.77%	789	52.24%
1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	950	51.58%	832	49.64%
1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	877	55.30%	759	54.06%
1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	932	52.50%	814	50.73%
1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	845	56.93%	727	55.99%
1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	2	915	53.36%	797	51.76%
1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	833	57.54%	715	56.72%
1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	2	920	53.11%	802	51.45%
1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	827	57.85%	709	57.08%
1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	2	836	57.39%	718	56.54%
1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	827	57.85%	709	57.08%
1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	2	824	58.00%	706	57.26%
1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	3	920	53.11%	802	51.45%
0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	946	51.78%	828	49.88%
0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	957	51.22%	839	49.21%
0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	945	51.83%	827	49.94%
0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	913	53.47%	795	51.88%
0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	2	941	52.04%	823	50.18%
0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	869	55.71%	751	54.54%
0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	2	937	52.24%	819	50.42%
0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	865	55.91%	747	54.78%
0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	2	933	52.45%	815	50.67%

0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	1	834	57.49%	716	56.66%
0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	2	852	56.57%	734	55.57%
0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	834	57.49%	716	56.66%
0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	848	56.78%	730	55.81%
1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	896	54.33%	778	52.91%
1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	951	51.53%	833	49.58%
1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	905	53.87%	787	52.36%
1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	950	51.58%	832	49.64%
1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	877	55.30%	759	54.06%
1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	2	932	52.50%	814	50.73%
1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	847	56.83%	729	55.87%
1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	2	916	53.31%	798	51.69%
1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	838	57.29%	720	56.42%
1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	2	914	53.41%	796	51.82%
1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	1	832	57.59%	714	56.78%
1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	2	836	57.39%	714	56.78%
1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	832	57.59%	714	56.78%
1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	827	57.85%	709	57.08%
1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	3	911	53.57%	793	52.00%
0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	949	51.63%	831	49.70%
0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	953	51.43%	835	49.46%
0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	942	51.99%	824	50.12%
0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	961	51.02%	843	48.97%
0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	2	944	51.89%	826	50.00%
0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3	946	51.78%	828	49.88%
0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	917	53.26%	799	51.63%
0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	2	940	52.09%	822	50.24%
0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	1	876	55.35%	758	54.12%

0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	2	935	52.34%	817	50.54%
0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	1	873	55.50%	755	54.30%
0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	2	930	52.60%	812	50.85%
0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	1	847	56.83%	729	55.87%
0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	2	845	56.93%	727	55.99%
0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	3	937	52.24%	819	50.42%
0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	847	56.83%	729	55.87%
0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	2	842	57.08%	724	56.17%
0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	3	932	52.50%	814	50.73%
1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	905	53.87%	787	52.36%
1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	945	51.83%	827	49.94%
1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	904	53.92%	786	52.42%
1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	946	51.78%	828	49.88%
1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	910	53.62%	792	52.06%
1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	2	948	51.68%	830	49.76%
1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	882	55.05%	764	53.75%
1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	2	930	52.60%	812	50.85%
1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	1	852	56.57%	734	55.57%
1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	2	918	53.21%	800	51.57%
1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	1	849	56.73%	731	55.75%
1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	2	906	53.82%	788	52.30%
1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	1	847	56.83%	729	55.87%
1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	2	823	58.05%	705	57.32%
1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	3	918	53.21%	800	51.57%
1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	847	56.83%	729	55.87%
1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	2	820	58.21%	702	57.51%
1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	3	906	53.82%	788	52.30%
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	982	49.95%	864	47.70%

0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	979	50.10%	861	47.88%
0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	952	51.48%	834	49.52%
0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	981	50.00%	863	47.76%
0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	2	948	51.68%	830	49.76%
0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	3	948	51.68%	830	49.76%
0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	985	49.80%	867	47.52%
0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	2	952	51.48%	834	49.52%
0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	3	950	51.58%	832	49.64%
0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	4	946	51.78%	828	49.88%
0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	1	965	50.82%	847	48.73%
0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	2	926	52.80%	808	51.09%
0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	3	848	56.78%	830	49.76%
0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	930	52.60%	812	50.85%
0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	2	918	53.21%	800	51.57%
0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	3	943	51.94%	825	50.06%
0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	1	927	52.75%	809	51.03%
0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	2	913	53.47%	795	51.88%
0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	3	942	51.99%	824	50.12%
0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	1	893	54.49%	775	53.09%
0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	2	859	56.22%	741	55.15%
0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	893	54.49%	775	53.09%
0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	2	856	56.37%	738	55.33%
0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	3	910	53.62%	792	52.06%
1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	939	52.14%	821	50.30%
1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	944	51.89%	826	50.00%
1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	939	52.14%	821	50.30%
1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	945	51.83%	827	49.94%
1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	938	52.19%	820	50.36%

1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	2	943	51.94%	825	50.06%
1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	942	51.99%	824	50.12%
1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	2	943	51.94%	825	50.06%
1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	1	928	52.70%	810	50.97%
1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	2	921	53.06%	803	51.39%
1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	3	946	51.78%	828	49.88%
1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	902	54.03%	784	52.54%
1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	2	908	53.72%	790	52.18%
1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	1	899	54.18%	781	52.72%
1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	2	896	54.33%	788	52.30%
1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	3	946	51.78%	828	49.88%
1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	1	892	54.54%	774	53.15%
1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	2	833	57.54%	715	56.72%
1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	3	906	53.82%	788	52.30%
1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	892	54.54%	774	53.15%
1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	2	830	57.70%	712	56.90%
1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	3	894	54.43%	776	53.03%
0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	980	50.05%	862	47.82%
0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1016	48.22%	898	45.64%
0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	946	51.78%	828	49.88%
0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	1012	48.42%	894	45.88%
0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2	953	51.43%	835	49.46%
0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3	946	51.78%	828	49.88%
0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	1010	48.52%	892	46.00%
0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	2	953	51.43%	835	49.46%
0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	3	948	51.68%	830	49.76%
0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	4	946	51.78%	828	49.88%
0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1012	48.42%	894	45.88%

0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	2	962	50.97%	844	48.91%
0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	3	847	56.83%	829	49.82%
0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	4	946	51.78%	828	49.88%
0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	1006	48.73%	888	46.25%
0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	2	925	52.85%	807	51.15%
0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	3	942	51.99%	824	50.12%
0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	1	985	49.80%	867	47.52%
0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	2	903	53.98%	785	52.48%
0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	3	939	52.14%	821	50.30%
0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	978	50.15%	860	47.94%
0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	2	901	54.08%	783	52.60%
0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	3	939	52.14%	821	50.30%
0	1	0	1	1	1	1	1	1	1	0	0	0	0	0	1	931	52.55%	813	50.79%
0	1	0	1	1	1	1	1	1	1	0	0	0	0	0	2	884	54.94%	766	53.63%
0	1	0	1	1	1	1	1	1	1	0	0	0	0	0	3	888	54.74%	770	53.39%
0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	931	52.55%	813	50.79%
0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	2	877	55.30%	759	54.06%
0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	3	886	54.84%	768	53.51%
1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	936	52.29%	818	50.48%
1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	945	51.83%	827	49.94%
1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	974	50.36%	856	48.18%
1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	943	51.94%	825	50.06%
1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3	946	51.78%	828	49.88%
1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	972	50.46%	854	48.31%
1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2	947	51.73%	829	49.82%
1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3	947	51.73%	829	49.82%
1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	4	946	51.78%	828	49.88%
1	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	970	50.56%	852	48.43%

1	0	0	0	0	0	1	1	1	1	0	0	0	0	0	2	942	51.99%	824	50.12%
1	0	0	0	0	0	1	1	1	1	0	0	0	0	0	3	954	51.38%	836	49.39%
1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	972	50.46%	854	48.31%
1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	2	948	51.68%	830	49.76%
1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	3	955	51.33%	837	49.33%
1	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	965	50.82%	847	48.73%
1	0	0	0	1	1	1	1	1	1	0	0	0	0	0	2	929	52.65%	811	50.91%
1	0	0	0	1	1	1	1	1	1	0	0	0	0	0	3	935	52.34%	817	50.54%
1	0	0	1	1	1	1	1	1	1	0	0	0	0	0	1	951	51.53%	933	43.52%
1	0	0	1	1	1	1	1	1	1	0	0	0	0	0	2	906	53.82%	788	52.30%
1	0	0	1	1	1	1	1	1	1	0	0	0	0	0	3	928	52.70%	810	50.97%
1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	945	51.83%	827	49.94%
1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	2	897	54.28%	779	52.85%
1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	3	932	52.50%	814	50.73%
1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	1	927	52.75%	809	51.03%
1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	2	857	56.32%	739	55.27%
1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	3	891	54.59%	773	53.21%
1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	927	52.75%	809	51.03%
1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	2	851	56.63%	733	55.63%
1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	3	882	55.05%	764	53.75%
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	862	56.07%	744	54.96%
0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	896	54.33%	778	52.91%
0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	946	51.78%	828	49.88%
0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	932	52.50%	814	50.73%
0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	2	946	51.78%	828	49.88%
0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	1	936	52.29%	818	50.48%
0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	2	945	51.83%	827	49.94%
0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	943	51.94%	825	50.06%

0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	2	938	52.19%	820	50.36%
0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	950	51.58%	832	49.64%
0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	2	941	52.04%	823	50.18%
0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	3	946	51.78%	828	49.88%
0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	1	946	51.78%	828	49.88%
0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	2	902	54.03%	784	52.54%
0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	3	941	52.04%	823	50.18%
0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	1	937	52.24%	819	50.42%
0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	2	870	55.66%	752	54.48%
0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	3	936	52.29%	818	50.48%
0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	1	934	52.40%	816	50.61%
0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	2	867	55.81%	749	54.66%
0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	3	934	52.40%	816	50.61%
0	1	0	1	1	1	1	1	1	1	1	0	0	0	0	1	938	52.19%	820	50.36%
0	1	0	1	1	1	1	1	1	1	1	0	0	0	0	2	823	58.05%	705	57.32%
0	1	0	1	1	1	1	1	1	1	1	0	0	0	0	3	862	56.07%	744	54.96%
0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	938	52.19%	820	50.36%
0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	2	820	58.21%	702	57.51%
0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	3	859	56.22%	741	55.15%
1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	847	56.83%	729	55.87%
1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	916	53.31%	798	51.69%
1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	882	55.05%	764	53.75%
1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	915	53.36%	797	51.76%
1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	920	53.11%	802	51.45%
1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	2	913	53.47%	795	51.88%
1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	1	924	52.91%	806	51.21%
1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	2	913	53.47%	795	51.88%
1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	927	52.75%	809	51.03%

1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	2	909	53.67%	791	52.12%
1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	3	946	51.78%	828	49.88%
1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	934	52.40%	816	50.61%
1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	2	910	53.62%	792	52.06%
1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	3	946	51.78%	828	49.88%
1	0	0	0	1	1	1	1	1	1	1	0	0	0	0	1	929	52.65%	811	50.91%
1	0	0	0	1	1	1	1	1	1	1	0	0	0	0	2	889	54.69%	771	53.33%
1	0	0	0	1	1	1	1	1	1	1	0	0	0	0	3	926	52.80%	808	51.09%
1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	1	925	52.85%	806	51.21%
1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	2	860	56.17%	742	55.08%
1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	3	918	53.21%	800	51.57%
1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	1	925	52.85%	807	51.15%
1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	2	845	56.93%	727	55.99%
1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	3	935	52.34%	817	50.54%
1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	1	934	52.40%	816	50.61%
1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	2	819	58.26%	701	57.57%
1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	3	848	56.78%	730	55.81%
1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	934	52.40%	816	50.61%
1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	2	820	58.21%	702	57.51%
1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	3	833	57.54%	715	56.72%
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	916	53.31%	798	51.69%
0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	832	57.59%	714	56.78%
0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	866	55.86%	748	54.72%
0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	2	946	51.78%	828	49.88%
0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	902	54.03%	784	52.54%
0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	2	946	51.78%	828	49.88%
0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	915	53.36%	797	51.76%
0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	2	936	52.29%	818	50.48%

0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	1	926	52.80%	808	51.09%
0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	2	927	52.75%	809	51.03%
0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	1	932	52.50%	814	50.73%
0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	2	930	52.60%	812	50.85%
0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	3	945	51.83%	827	49.94%
0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	1	927	52.75%	809	51.03%
0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	2	891	54.59%	773	53.21%
0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	3	941	52.04%	823	50.18%
0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	923	52.96%	805	51.27%
0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	2	855	56.42%	737	55.39%
0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	3	936	52.29%	818	50.48%
0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	925	52.85%	807	51.15%
0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	2	850	56.68%	732	55.69%
0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	3	931	52.55%	813	50.79%
0	1	0	1	1	1	1	1	1	1	1	1	0	0	0	1	945	51.83%	827	49.94%
0	1	0	1	1	1	1	1	1	1	1	1	0	0	0	2	803	59.07%	685	58.54%
0	1	0	1	1	1	1	1	1	1	1	1	0	0	0	3	846	56.88%	728	55.93%
0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	945	51.83%	827	49.94%
0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	2	805	58.97%	687	58.41%
0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	3	841	57.14%	723	56.23%
1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	886	54.84%	768	53.51%
1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	931	52.55%	813	50.79%
1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	832	57.59%	714	56.78%
1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	901	54.08%	783	52.60%
1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	867	55.81%	749	54.66%
1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	2	900	54.13%	782	52.66%
1	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	905	53.87%	787	52.36%
1	0	0	0	0	0	0	0	1	1	1	1	0	0	0	2	898	54.23%	780	52.78%

1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	918	53.21%	800	51.57%
1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	2	889	54.69%	771	53.33%
1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	3	945	51.83%	827	49.94%
1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	1	929	52.65%	811	50.91%
1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	2	875	55.40%	757	54.18%
1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	3	948	51.68%	830	49.76%
1	0	0	0	0	1	1	1	1	1	1	1	0	0	0	1	936	52.29%	818	50.48%
1	0	0	0	0	1	1	1	1	1	1	1	0	0	0	2	874	55.45%	756	54.24%
1	0	0	0	0	1	1	1	1	1	1	1	0	0	0	3	950	51.58%	932	43.58%
1	0	0	0	1	1	1	1	1	1	1	1	0	0	0	1	930	52.60%	812	50.85%
1	0	0	0	1	1	1	1	1	1	1	1	0	0	0	2	853	56.52%	735	55.51%
1	0	0	0	1	1	1	1	1	1	1	1	0	0	0	3	931	52.55%	813	50.79%
1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	928	52.70%	810	50.97%
1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	2	823	58.05%	705	57.32%
1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	3	923	52.96%	805	51.27%
1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	929	52.65%	711	56.96%
1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	2	820	58.21%	702	57.51%
1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	3	910	53.62%	792	52.06%
1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	1	941	52.04%	823	50.18%
1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	2	815	58.46%	697	57.81%
1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	3	814	58.51%	696	57.87%
1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	4	921	53.06%	803	51.39%
1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	941	52.04%	823	50.18%
1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	2	816	58.41%	698	57.75%
1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	3	811	58.66%	693	58.05%
1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	4	908	53.72%	790	52.18%
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	934	52.40%	816	50.61%
0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	911	53.57%	793	52.00%

0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	939	52.14%	821	50.30%
0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	835	57.44%	717	56.60%
0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	2	931	52.55%	813	50.79%
0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	864	55.96%	746	54.84%
0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	2	936	52.29%	818	50.48%
0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	900	54.13%	782	52.66%
0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	2	936	52.29%	818	50.48%
0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	1	913	53.47%	795	51.88%
0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	2	924	52.91%	806	51.21%
0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	1	924	52.91%	806	51.21%
0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	2	914	53.41%	796	51.82%
0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	3	947	51.73%	829	49.82%
0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	1	930	52.60%	812	50.85%
0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	2	918	53.21%	800	51.57%
0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	3	947	51.73%	829	49.82%
0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	1	925	52.85%	807	51.15%
0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	2	878	55.25%	760	54.00%
0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	3	944	51.89%	826	50.00%
0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	921	53.06%	803	51.39%
0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	2	843	57.03%	725	56.11%
0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	3	937	52.24%	819	50.42%
0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	923	52.96%	805	51.27%
0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	2	839	57.24%	721	56.36%
0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	3	931	52.55%	813	50.79%
0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	944	51.89%	826	50.00%
0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	2	802	59.12%	684	58.60%
0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	3	835	57.44%	717	56.60%
0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	944	51.89%	826	50.00%

0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	2	804	59.02%	686	58.47%
0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	3	831	57.65%	713	56.84%
1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	889	54.69%	771	53.33%
1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	946	51.78%	828	49.88%
1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	878	55.25%	760	54.00%
1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	930	52.60%	812	50.85%
1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	830	57.70%	712	56.90%
1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	2	896	54.33%	778	52.91%
1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	864	55.96%	746	54.84%
1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	2	892	54.54%	774	53.15%
1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	903	53.98%	785	52.48%
1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	2	888	54.74%	770	53.39%
1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	3	946	51.78%	828	49.88%
1	0	0	0	0	0	0	1	1	1	1	1	1	0	0	1	916	53.31%	798	51.69%
1	0	0	0	0	0	0	1	1	1	1	1	1	0	0	2	877	55.30%	759	54.06%
1	0	0	0	0	0	0	1	1	1	1	1	1	0	0	3	947	51.73%	829	49.82%
1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	1	927	52.75%	809	51.03%
1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	2	860	56.17%	742	55.08%
1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	3	955	51.33%	837	49.33%
1	0	0	0	0	1	1	1	1	1	1	1	1	0	0	1	934	52.40%	816	50.61%
1	0	0	0	0	1	1	1	1	1	1	1	1	0	0	2	860	56.17%	742	55.08%
1	0	0	0	0	1	1	1	1	1	1	1	1	0	0	3	956	51.27%	838	49.27%
1	0	0	0	1	1	1	1	1	1	1	1	1	0	0	1	928	52.70%	810	50.97%
1	0	0	0	1	1	1	1	1	1	1	1	1	0	0	2	839	57.24%	721	56.36%
1	0	0	0	1	1	1	1	1	1	1	1	1	0	0	3	936	52.29%	818	50.48%
1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	926	52.80%	808	51.09%
1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	2	810	58.72%	692	58.11%
1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	3	926	52.80%	808	51.09%

1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	927	52.75%	809	51.03%
1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	2	808	58.82%	690	58.23%
1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	3	911	53.57%	793	52.00%
1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	940	52.09%	822	50.24%
1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	2	814	58.51%	696	57.87%
1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	3	802	59.12%	684	58.60%
1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	4	923	52.96%	805	51.27%
1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	940	52.09%	822	50.24%
1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	2	815	58.46%	697	57.81%
1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	3	800	59.23%	682	58.72%
1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	4	908	53.72%	790	52.18%
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	950	51.58%	832	49.64%
0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	943	51.94%	825	50.06%
0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	941	52.04%	823	50.18%
0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	920	53.11%	802	51.45%
0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	2	936	52.29%	818	50.48%
0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	848	56.78%	730	55.81%
0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	2	925	52.85%	807	51.15%
0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	878	55.25%	760	54.00%
0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	2	930	52.60%	812	50.85%
0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	905	53.87%	787	52.36%
0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	2	940	52.09%	822	50.24%
0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	976	50.25%	798	51.69%
0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	2	928	52.70%	810	50.97%
0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	3	945	51.83%	827	49.94%
0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	926	52.80%	808	51.09%
0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	2	922	53.01%	804	51.33%
0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	3	940	52.09%	822	50.24%

0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	931	52.55%	813	50.79%
0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	2	924	52.91%	806	51.21%
0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	3	943	51.94%	825	50.06%
0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	935	52.34%	817	50.54%
0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	2	889	54.69%	771	53.33%
0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	3	935	52.34%	817	50.54%
0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	922	53.01%	804	51.33%
0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	2	858	56.27%	740	55.21%
0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	3	924	52.91%	806	51.21%
0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	924	52.91%	806	51.21%
0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	2	850	56.68%	732	55.69%
0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	3	924	52.91%	806	51.21%
0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	945	51.83%	827	49.94%
0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	2	814	58.51%	696	57.87%
0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	3	838	57.29%	720	56.42%
0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	945	51.83%	827	49.94%
0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	816	58.41%	698	57.75%
0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	3	830	57.70%	712	56.90%
1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	915	53.36%	797	51.76%
1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	936	52.29%	818	50.48%
1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	907	53.77%	789	52.24%
1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	933	52.45%	815	50.67%
1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	896	54.33%	778	52.91%
1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	2	918	53.21%	800	51.57%
1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	849	56.73%	731	55.75%
1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	2	887	54.79%	769	53.45%
1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	880	55.15%	762	53.87%
1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	2	891	54.59%	773	53.21%

1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	910	53.62%	791	52.12%
1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	2	897	54.28%	779	52.85%
1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	3	935	52.34%	817	50.54%
1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	921	53.06%	803	51.39%
1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	2	886	54.84%	768	53.51%
1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	3	938	52.19%	820	50.36%
1	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	931	52.55%	813	50.79%
1	0	0	0	0	0	1	1	1	1	1	1	1	1	0	2	872	55.56%	754	54.36%
1	0	0	0	0	0	1	1	1	1	1	1	1	1	0	3	944	51.89%	826	50.00%
1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	937	52.24%	819	50.42%
1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	2	870	55.66%	752	54.48%
1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	3	948	51.68%	830	49.76%
1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	913	53.47%	813	50.79%
1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	2	851	56.63%	733	55.63%
1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	3	929	52.65%	811	50.91%
1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	928	52.70%	810	50.97%
1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	2	827	57.85%	709	57.08%
1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	3	916	53.31%	798	51.69%
1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	929	52.65%	811	50.91%
1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	2	821	58.15%	703	57.45%
1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	3	907	53.77%	789	52.24%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	942	51.99%	824	50.12%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	2	825	57.95%	707	57.20%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	3	809	58.77%	691	58.17%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	4	911	53.57%	793	52.00%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	942	51.99%	824	50.12%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	826	57.90%	708	57.14%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	3	803	59.07%	685	58.54%

1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	4	902	54.03%	784	52.54%
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	939	52.14%	821	50.30%
0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	943	51.94%	831	49.70%
0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	946	51.78%	828	49.88%
0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	938	52.19%	820	50.36%
0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	939	52.14%	821	50.30%
0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	919	53.16%	801	51.51%
0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	931	52.55%	813	50.79%
0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	849	56.73%	731	55.75%
0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	919	53.16%	801	51.51%
0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	877	55.30%	759	54.06%
0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	926	52.80%	808	51.09%
0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	906	53.82%	788	52.30%
0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	934	52.40%	816	50.61%
0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	917	53.26%	799	51.63%
0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	922	53.01%	804	51.33%
0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	926	52.80%	808	51.09%
0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	917	53.26%	799	51.63%
0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	3	938	52.19%	820	50.36%
0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	931	52.55%	813	50.79%
0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	919	53.16%	801	51.51%
0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	3	941	52.04%	823	50.18%
0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	926	52.80%	808	51.09%
0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	884	54.94%	766	53.63%
0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	3	932	52.50%	814	50.73%
0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	922	53.01%	804	51.33%
0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	852	56.57%	734	55.57%
0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	3	922	53.01%	804	51.33%

0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	924	52.91%	806	51.21%
0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	845	56.93%	727	55.99%
0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	3	921	53.06%	803	51.39%
0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	945	51.83%	827	49.94%
0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	2	813	58.56%	695	57.93%
0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	3	833	57.54%	715	56.72%
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	945	51.83%	827	49.94%
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	815	58.46%	697	57.81%
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	826	57.90%	708	57.14%
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	896	54.33%	778	52.91%
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	944	51.89%	826	50.00%
1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	910	53.62%	792	52.06%
1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	934	52.40%	816	50.61%
1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	903	53.98%	785	52.48%
1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	931	52.55%	813	50.79%
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	893	54.49%	775	53.09%
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	919	53.16%	801	51.51%
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	848	56.78%	730	55.81%
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	886	54.84%	768	53.51%
1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	879	55.20%	761	53.93%
1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	888	54.74%	770	53.39%
1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	911	53.57%	793	52.00%
1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	892	54.54%	774	53.15%
1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	3	933	52.45%	815	50.67%
1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	922	53.01%	804	51.33%
1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	881	55.10%	763	53.81%
1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	3	936	52.29%	818	50.48%
1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	931	52.55%	813	50.79%

1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	868	55.76%	750	54.60%
1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	3	942	51.99%	824	50.12%
1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	937	52.24%	819	50.42%
1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	866	55.86%	748	54.72%
1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	3	946	51.78%	828	49.88%
1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	931	52.55%	813	50.79%
1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	847	56.83%	729	55.87%
1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	3	927	52.75%	809	51.03%
1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	928	52.70%	810	50.97%
1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	823	58.05%	705	57.32%
1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	3	913	53.47%	795	51.88%
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	929	52.65%	811	50.91%
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	818	58.31%	700	57.63%
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	3	903	53.98%	785	52.48%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	942	51.99%	824	50.12%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	2	824	58.00%	706	57.26%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	3	806	58.92%	688	58.35%
1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	4	908	53.72%	790	52.18%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	942	51.99%	824	50.12%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	825	57.95%	707	57.20%
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	801	59.17%	683	58.66%
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	4	898	54.23%	790	52.18%
1.5	2	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	2	827	57.85%	709	57.08%
1.5	2	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	3	798	59.33%	680	58.84%
1.5	2	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4	784	60.04%	666	59.69%
1.5	2	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	5	817	58.36%	699	57.69%
1.5	2	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.5	783	60.09%	665	59.75%
1.5	2	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.6	802	59.12%	684	58.60%

1.4	2	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.6	802	59.12%	684	58.60%
1.4	2.4	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.6	782	60.14%	664	59.81%
1.4	2.4	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.5	781	60.19%	663	59.87%
1.4	2.4	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.4	785	59.99%	667	59.62%
1.3	2.4	1	3	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.4	784	60.04%	666	59.69%
1.3	2.4	1	3.1	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.4	780	60.24%	662	59.93%
1.3	2.4	1	4.5	2.5	1	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.4	779	60.30%	661	59.99%
1.4	2.4	1	4.5	2.5	0.7	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.5	779	60.30%	661	59.99%
1.4	2.4	1	4.5	2.5	0.7	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.4	781	60.19%	663	59.87%
1.4	2.4	1	4.5	2.5	0.7	1.2	1	0.5	1	1.5	1.75	1.75	1	1.5	4.6	782	60.14%	664	59.81%
1.4	2.4	1	4.5	2.5	0.7	1.2	1.8	0.5	1	1.5	1.75	1.75	1	1.5	4.6	775	60.50%	657	60.23%
1.4	2.4	1	4.5	2.5	0.7	1.2	1.8	0.5	1	1.5	1.75	1.75	1	1.5	4.5	774	60.55%	656	60.29%
1.4	2.4	1	4.5	2.5	0.7	1.2	1.8	0.5	1	1.5	1.75	1.75	1	1.5	4.4	777	60.40%	659	60.11%
1.4	2.3	1	4.5	2.5	0.7	1.2	1.8	0.5	1	1.5	1.75	1.75	1	1.5	4.4	774	60.55%	656	60.29%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.8	0.5	1	1.5	1.75	1.75	1	1.5	4.4	773	60.60%	655	60.35%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.8	0.5	1	1.5	1.75	1.75	1	1.5	4.3	776	60.45%	658	60.17%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.8	0.5	1	1.5	1.75	1.75	1	1.5	4.5	781	60.19%	663	59.87%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.8	0.5	0.8	1.5	1.75	1.75	1	1.5	4.5	770	60.75%	652	60.53%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.5	0.5	0.8	1.5	1.75	1.75	1	1.5	4.5	769	60.81%	651	60.59%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.5	0.5	0.8	2.5	1.75	1.75	1	1.5	4.4	749	61.82%	631	61.80%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.5	0.5	0.8	3.2	1.75	1.75	1	1.5	4.4	746	61.98%	628	61.99%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.5	0.5	0.8	3.2	1.75	1.75	1	1.5	4.5	749	61.82%	631	61.80%
1.4	2.3	0.6	4.5	2.5	0.7	1.2	1.5	0.5	0.8	3.2	1.75	1.75	1	1.5	4.6	755	61.52%	637	61.44%
1.4	2.3	0.6	4.4	2.5	0.7	1.2	1.5	0.6	0.8	3.2	1.75	1.75	1	1.5	4.4	746	61.98%	628	61.99%
1.4	2.3	0.6	4.4	2.5	0.7	1.2	1.5	0.6	0.8	3.2	1.7	2.3	0.6	1.5	4.4	745	62.03%	627	62.05%
1.4	2.3	0.6	4.4	2.5	0.7	1.2	1.5	0.6	0.8	3.2	1.7	2.3	0.6	2.7	4.4	744	62.08%	626	62.11%
1.4	2.3	0.6	4.4	2.5	0.7	1.2	1.5	0.6	0.8	3.2	1.7	2.3	0.6	2.7	4.5	751	61.72%	633	61.68%
1.4	2.3	0.6	4.4	2.5	0.7	1.2	1.5	0.6	0.8	3.2	1.7	2.3	0.6	2.7	4.3	755	61.52%	637	61.44%

1.4	2.5	0.6	2.9	2.9	0.6	0.5	1.2	0.5	0.9	1.9	1.8	1.9	0.6	2.4	4.2	747	61.93%	629	61.92%
1.4	2.5	0.6	3	2.9	0.4	0.7	1.2	0.5	0.9	1.8	1.9	2	0.6	2.4	4.2	748	61.88%	623	62.29%
1.3	2.3	0.7	2.9	2.9	0.8	1	1.1	1	1	2.6	2	2.1	0.9	2.4	4.4	749	61.82%	631	61.80%
1.4	2	0.8	3.8	3.3	0.79	1.01	1.03	1.2	1.3	2.6	1.9	1.4	1	2.2	4.4	761	61.21%	643	61.08%