ACCESS AND EQUITY: CALIFORNIA MASTER PLAN FOR HIGHER EDUCATION AND DISADVANTAGED STUDENT SUCCESS

A Project

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ABSTRACT

The California Master Plan for Higher Education sets a policy objective of equity through access to higher education. The California State University system is California's primary institution for providing the social mobility that accompanies a four-year college degree. The purpose of this study is to examine the education lifecycle outcomes for a cohort of first-time freshman applicants to Cal Poly Pomona College of Business Administration, determine to what degree equity goals are being served, and make recommendations for policy change where shortcomings are observed.

Keywords: higher education, California Master Plan, social mobility

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CHAPTER 1

INTRODUCTION

The California Master Plan for Higher Education, established in 1960, codifies the principle that equity is increased in society when the smartest and hardest working students have equal access to higher education. This concept of social mobility was already an established part of California higher education culture and, indeed, public land grant colleges across the nation.

Over the decades since the Master Plan was written, it undoubtedly had a great impact on those served by California's public higher education institutions and on the state itself. During those years, many studies have been conducted to assess the impact of the master plan and the effectiveness with which California public higher education promotes access and equity. The subject is a frequently recurring topic of interest due to changes in political climate, state policy goals, funding, population growth, demographic shift, and increased demand for higher education.

This study examines the degree to which California State Polytechnic University, Pomona furthers the policy goals of the Master Plan in promoting access to disadvantaged students. Cal Poly Pomona provides an especially interesting data point for studying access to higher education because of the high percentage of Latino students applying for and attending the university. Cal Poly Pomona has been designated a Hispanic Serving Institution (HSI) since 2003. HSIs are public or non-profit colleges and universities with at least 25% Hispanic enrollment. Significant Federal funding and grant opportunities are made available to HSIs with the goal of increasing access and outcomes for Hispanic students.

Despite the many existing reports on the subject, this study is important for several reasons. Much of the literature is now significantly dated, having been based primarily on data from the 1980s and 1990s. Nearly all of the literature addressing standardized testing for admission to California's public universities has concentrated on the University of California rather than the California State University. Finally, much of the existing quantitative analysis involving predictors of college success focus only on freshman year grade point average (GPA).

Early Successes

Discussions of the California Master Plan for Higher Education (formally the Donahoe Education Act) often revolve around themes of access and equity. But what do these words mean in the context of public higher education in the United States? Social mobility was a primary goal of public higher education in the United States in the 19th and 20th centuries, and the underlying social contract found within the California Master Plan, that the top secondary school students would gain access to higher education on merit alone, was a continuation of an American ideal dating back to the mid-19th century. It was well understood that one of the individual benefits of higher education was increased earning potential. This was also considered a societal benefit in a nation where people valued the idea that success should depend on merit and not birthright (Douglass, 2000).

Toward this end, the California Master Plan guaranteed the top one-eighth of high school graduates a place in the University of California system, the top one-third a place in the state colleges, which would become the California State University system, and all high school graduates a place in the community colleges (Master Plan Survey Team, 1960). It

also provided funding for a tuition-free education at any of the state's higher education institutions, with students being charged fees only for housing, meals, parking, and other student services. Further, the Master Plan provided that student aid be made available and periodically increased to keep pace with student fees (Master Plan Survey Team, 1960).

California had pioneered the idea of a transfer path from community college into the University of California (UC) in the early 20th century. The Master Plan further enshrined this concept by specifying that both the UC and the State Colleges maintain a 40/60 ratio of underclassmen to upperclassmen. Applicants completing an associate's degree at a state community college were to be given preference in the admissions process and would start their four-year degree with junior class standing (Douglass, 2007). By the close of the 20th century, these provisions for social mobility had been wildly successful. In 2002, nearly a quarter (23.1 percent) of University of California students reported a family income under $35,000 per year (Flacks, Thomson, Douglass, & Caspary, 2004).

Goals and Challenges

When the Master Plan was written in 1960, there was little national discussion surrounding higher education access for minority ethnic groups. This changed significantly as the civil rights movement picked up pace in the ensuing decades (Douglass, 2007; Commission for the Review of the Master Plan for Higher Education, 1987). Indeed, in the 1973 Master Plan report, the joint committee recommended that "each segment of California public higher education shall strive to approximate by 1980 the general ethnic, sexual and economic composition of the recent California high school graduates" (Joint Committee on the Master Plan for Higher Education, 1973). While

1980 has come and gone and there has been some change, California has yet to reach this lofty goal.

Another goal of the California Master Plan was re-directing about 50,000 students away from the University of California and the state colleges (CSU) into the community colleges. This was partly a plan to increase the selectivity and rigor of the UC and CSU and partly because the rapidly increasing demand for higher education made it seem more fiscally prudent to educate more students in the less expensive community college system (Douglass, 2007; Master Plan Survey Team, 1960). As a result, UC admissions targets changed from the top 15 percent of high school graduates to 12.5 percent, and CSU admissions targets changed from the top 50 percent to the top 33 percent (Master Plan Survey Team, 1960). Since transfer students were given admissions priority and transfers benefited from the 40/60 lower-to-upper-classmen ratio described in the Master Plan, it was argued that no students would lose the opportunity to obtain a four-year degree (Douglass, 2000).

To meet these new target percentages, the high school GPA requirement for admission into the UC and CSU was also increased. This was not enough to decrease the number of qualifying high school graduates, however, and rather than deal with the politically unpopular move of increasing the GPA requirement again, the UC Board of Admissions and Relations with Schools (BOARS) began to look for other ways to decrease admissions (Douglass, 2007).

BOARS had previously commissioned numerous studies on the SAT, formerly called the Scholastic Aptitude Test, which had already been adopted at many universities outside California. Those studies had generally found that the SAT did not add

significantly to high school or transfer GPA as a predictor of student success. Though Educational Testing Service (ETS) had lobbied fiercely to have their test adopted in California, even offering the test free to all applicants for a year as part of a study, the SAT had always been rejected as an admission requirement (Douglass, 2007).

In 1964, the results of a new SAT study were presented to BOARS. Like similar studies in the past, the findings were that the SAT would not add significantly to GPA in predicting student success. As Douglass observed (2007) there was one note in the report which would turn out to be a "prophetic observation," that the SAT might be used as a "somewhat arbitrary tool for reducing eligibility." Starting in 1968 the University of California began requiring SAT scores for all applicants (Douglass, 2007).

During the Great Recession of 2007 to 2009, public funding for higher education was cut in many states including California. Freshman enrollment at Cal Poly Pomona which peaked at 5,518 in 2007 declined dramatically as administrators cut admissions targets. The low point was in 2010 with only 3,475 freshman, a 37 percent drop. As of 2014 freshman enrollment is 5,055, still 8 percent down from the pre-recession peak. (California State Polytechnic University, Pomona, 2014).

As Johnson (2010) found, when more students are admitted admission rates increase disproportionately for both under-represented minority and lower income applicants. This is a result of the over-representation of White and Asian, high income applicants among those with the highest eligibility index scores. The converse is also true, that reducing admissions numbers disproportionately excludes under-represented minority and lower income applicants.

Tuition and fees have skyrocketed and access to higher education is under significant threat (California Postsecondary Education Commission, 2006; Joint Committee on the Master Plan for Higher Education, 2010). The community college transfer rate goals set by the master plan are no longer being met (Martinez-Wenzl, M. & Marquez, R., 2012). There has never been a more critical time for studying the intersection of race, class, and public higher education in California and the challenges to the individual, societal, and institutional progress made over the last half century. It is for these reasons that I have undertaken this study, designed to inform public policy related to admissions, recruitment, outreach, and student services at Cal Poly Pomona.

CHAPTER 2

LITERATURE REVIEW

The literature review first examines the current state of access to California's public higher education institutions for disadvantaged groups. Areas covered include: socio-economic equity; historically under-represented ethnic groups; and gender disparity. Next, the review looks specifically at where Cal Poly Pomona stands with regards to access. Last, the literature review examines the factors identified in the literature as correlating with student success.

Socio-Economic Equity

California State University (CSU) Attendance Rates

A 2006 California Postsecondary Education Commission (CPEC) report observed that, following many years of a downward trend in the socio-economic college attendance gap, the gap had started widening again. Between 1991 and 1993 the CSU attendance rate was essentially identical for low-income (bottom 30 percent) and mid-income (middle 40 percent) high school graduates. Between 1995 and 2005 the CSU college attendance rate for low income high school graduates remained flat while the mid-income rate increased by 20 percent and the high income (top 30 percent) rate increased by nearly 50 percent. By 2005 the CSU college attendance rate for the three groups was 7.8 percent, 9.3 percent, and 12.2 percent, respectively.

The story was similar in the University of California (UC) and community colleges. In 2005 UC attendance rates for high-income students was double the rate of mid-income and triple the rate of low income students. Community college attendance is

almost 30 percent higher for mid-income students than for low-income students (California Postsecondary Education Commission, 2006).

SAT Scores Correlate with Income

Geiser's (2001; 2007; 2008) extensive research on SAT scores as an admission requirement for the UC have consistently shown a correlation between SAT score and income. Reed (2005) and Johnson (2010) have confirmed Geiser's findings and extended their relevance beyond the UC data. These findings underscore criticism that the SAT is a culturally-biased exam which doesn't fairly measure aptitude.

The literature is clear that the primary mechanism negatively influencing the eligibility of low-income high school graduates for CSU and UC admission is the use of SAT scores in the eligibility formula. Geiser and Santelices (2007) and Princiotta et al. (2014) found no significant correlation between income and high school grade point average (GPA), the other component of the CSU eligibility index.

Historically Under-Represented Ethnic Groups

College Completion Rates in California Differ Widely among Ethnic Groups

Reed (2005) found that college completion rates among all California native 25 year olds varied between 13 percent for Hispanics and 15 percent for blacks vs 62 percent for Asians. The only groups other than Asians with completion rates above the state average of 25 percent were Whites and Filipinos. This discrepancy was also noted by Nora and Crisp (2012) who observed that Hispanic bachelor's degree attainment significantly lagged behind all other ethnic groups.

According to CPEC (2007), CSU graduates as a ratio of the state's population aged 18-24 was increasing for all ethnic groups but fastest among Asians and Whites. The

White and Asian increase rate of 7.5 percent and 8.1 percent were both more than double the Latino rate of 3.7 percent.

CSU Eligibility Rates Paint a Similar Picture

Johnson (2010) found CSU eligibility rates differing nearly as widely as Reed's (2005) completion rates. At the high end, 50.9 percent of Asian high school graduates met minimum CSU eligibility requirements while at the low end, only 22.5 percent of Latino high school graduates met the same requirements. Johnson (2010) noted that the impact of anti-affirmative action Proposition 209 in 1996 combined with the decreasing number of eligible students has resulted in Latino CSU enrollment rates barely keeping pace with California's Latino population growth.

Community College Transfer Rates Don't Close the Gap

Although California's community college system was designed to help close the 4-year degree gap for lower socio-economic and underrepresented groups, this didn't seem to be happening. Martinez-Wenzl and Marquez (2012) found that community college transfer rates in Los Angeles, Orange, and San Bernardino Counties showed large ethnic group disparity. As with Johnson's (2010) work, Martinez-Wenzl and Marquez's (2012) results closely parallel Reed's (2005) findings. Latino community college students had the lowest transfer rates in Los Angeles and San Bernardino at 29 percent and 26 percent respectively, while Filipino students were the lowest in Orange County at 32 percent. In contrast, Asian students were the only ethnic group transferring to 4-year schools at above the county average rate in all three counties with rates of 54 percent in Los Angeles, 36 percent in San Bernardino, and 57 percent in Orange County.

The numbers were starkest at community colleges in White and Asian-majority areas, where White and Asian students had a transfer rate nearly three times that of Latino students. However, even at highly segregated inner-city community colleges, Latino transfer rates lagged behind other ethnic groups.

The Income Effect Again

Because California's under-represented minority applicants tend to also have lower incomes, the literature observes similar effects for under-represented minorities as previously noted for low-income applicants. The California Postsecondary Education Commission (2006) found that low-income under-represented minority high school graduates had the lowest college attendance rate of any group.

Gender Disparity in Conjunction with Ethnic and Socio-Economic Effects

Johnson (2010) found that the CSU eligibility rate for female California high school graduates was more than ten points higher than for male high school graduates at 37.6 percent and 27.3 percent, respectively. This shift has been observed to have disparate impacts among ethnic and socio-economic groups.

CPEC (2006) found that CSU attendance rates for high-income (top 30%) females was 25 percent greater, proportionally, than for high-income males. For mid-income (middle 40 percent) females the rate was 40 percent greater and for low-income females the rate was nearly 50 percent greater at 9.2 percent vs 6.2 percent.

A similar interaction between gender and ethnicity was observed by CPEC researchers (2006) who found that in 2005, CSU attendance rates were higher for Black females at all income levels than they were for Black males at the highest income level.

Another CPEC report (2007) found that both the CSU and UC gender gaps widened the most between 1997 and 2006 among Latino students.

Progress at Cal Poly Pomona

Cal Poly Pomona has fared somewhat better than the CSU average in providing access to historically under-represented groups and Hispanics in particular. In 2014 the university was 37.8 percent Hispanic, 4th highest in the CSU behind only the Los Angeles, Stanislaus, and Fresno campuses (California State Polytechnic University, Pomona, 2014).

Though high for a CSU campus, this percentage still falls far short of equal representation. In 2014, the percentage of Hispanic residents age 18-22 was 60.0 percent in Los Angeles County, 43.0 percent in Orange County, and 58.7 percent in San Bernardino County. The three-county total was 56.4 percent, putting Cal Poly Pomona's 37.8 percent into perspective (State of California, Department of Finance, 2014).

Factors Contributing to Higher Education Success

Social Factors Correlated with Admission

Reed (2005) and Johnson (2010) found significant positive correlations between California high school graduate higher education admission rates and both female gender, and income. They found significant negative correlations between admission rates and first-generation higher education status, and black or Hispanic ethnicity. Geiser and Santelices (2007) explored the many possible mechanisms for these relationships in the UC admission criteria, which took into account 14 different measures, including high school GPA (HS GPA) and SAT, and found that the SAT requirement was a significant contributor to lower admission rates for disadvantaged groups. In contrast, the CSU

admissions criteria were more straightforward, and the mechanisms that accounted for these social factor correlations in the CSU were easier to analyze than in the UC.

According to the 2008-09 CSU Admission Handbook, the eligibility index for that year was calculated by simply multiplying HS GPA by 800 and adding the SAT I scores in mathematics and critical reading. The interaction ratio was therefore 0.1 HS GPA points being equivalent in value to 80 points on the SAT I cumulative score. Princiotta et al. (2014) and Geiser (2001; 2007) both found a moderate correlation between gender and HS GPA, but for the other social factors, HS GPA was either not significant or only weakly related. Geiser and Santelices (2007) found that SAT I scores, on the other hand, were strongly associated with income, parent's education, and ethnicity.

Factors Influencing GPA

Geiser (2001), Geiser and Santelices (2007), Niu and Tienda (2009), and Cornwell, Mustard, and Van Parys (2008) all studied factors influencing postsecondary GPA and independently found that HS GPA had the strongest association among the factors they considered.

Geiser and Santelices (2007) found that, second to HS GPA, the SAT II Writing subscore had the next highest correlation. Interestingly, they found that SAT I Math and SAT II Math scores had a significant and weakly negative association with postsecondary GPA. When grouped by postsecondary field of study, this effect reversed in the sciences and became somewhat more pronounced in other fields.

Niu and Tienda (2009) found high school class rank to be the best predictor for postsecondary GPA. They subsequently found that adding SAT scores while controlling for high school economic strata added little to the predictive accuracy.

Cornwell, Mustard, and Van Parys (2008) found that, secondary to HS GPA, high school fixed effects, such as demographics, advising, academic rigor, and teacher quality, were the next best predictor of GPA. In their study, as with Geiser and Santelices (2007), SAT Writing scores also showed a strong correlation with postsecondary GPA.

Noftle and Robins (2007) and O'Connor and Paunonen (2007) studied the possible predictive strength of the 'Big Five' personality traits as measured by several personality inventory tests. Noftle and Robins (2007) found that the Big Five sub-score for conscientiousness was a stronger predictor of postsecondary GPA than SAT scores. O'Connor and Paunonen (2007) conducted a meta-analysis of 27 studies and found consistent evidence linking Big Five conscientiousness to multiple postsecondary success indicators, most notably GPA.

Factors Influencing Completion

Niu and Tienda (2009) and Princiotta et al. (2014) found correlations between HS GPA and postsecondary completion rates. Niu and Tienda's (2009) results were similar to those for postsecondary GPA, finding that SAT scores add little predictive accuracy when controlled for income status. Princiotta et al. (2014) found that the top factors correlating with college completion were HS GPA, SAT, gender, parental marriage status, highest math class taken, and parental education, in that order.

Nora and Crisp (2012) found ethnicity to correlate with postsecondary completion rates. Specifically, Latino students were significantly less likely to finish their college degree program.

Factors Influencing Student Engagement

Flacks, Thomson, Douglass, and Caspary (2004) found a positive correlation between academic engagement and lower socio-economic status, first-generation college status, and HS GPA. The most common engagement indicator correlated with these groups was time spent studying.

Limitations of the Existing Research

There are two limitations common in many of these studies. One is that, with the exception of Niu and Tienda (2009) and Geiser and Santelices (2007), GPA correlations only used student GPA during the first year of college as the dependent variable rather than the cumulative undergraduate GPA. The research does not provide adequate evidence that first-year GPA is strongly correlated with either cumulative undergraduate GPA or completion rates.

The other limitation is that the SAT is a moving target. In 2006 ETS began administering a new SAT, re-designed based partly on criticism levied against the test by UC researchers (Geiser & Santelices, 2007; Douglass, 2007). As Geiser (2008) notes, this new SAT exam rendered all previously conducted research on the SAT's effectiveness at predicting higher education outcomes at least somewhat suspect, especially since it was created specifically to address such criticism.

Summary of the Literature

The literature finds ethnicity and socio-economic status to influence admissions rates through SAT scores. Gender is cited as influencing admissions rates through HS GPA. Due to differing admissions rates, there is a significant difference in CSU attendance based on gender, ethnicity, and socio-economic status. Public higher education

outcomes in California are very different among various ethnic groups. In particular, Asians and Whites are over-represented in both the CSU and UC while other groups, most markedly Latinos, are not represented equivalently to their age 18-24 population ratios. This effect is generally seen as separate but overlapping with the socio-economic gap and is not being addressed adequately by community college transfers.

The literature consistently finds high school GPA to be the strongest predictor of university GPA and completion, typically by a large margin. Among the literature there is some disagreement on the relative strength of secondary indicators for university GPA and completion including: various SAT sub-scores; gender; first-generation higher education status; high school fixed effects; Big Five personality test conscientiousness score; and socio-economic status.

While Cal Poly Pomona has succeeded relative to most other CSU campuses in attracting Latino students, Latinos are still under-represented on campus compared with the surrounding community.

CHAPTER 3

METHODOLOGY

This study was conducted to evaluate the success with which Cal Poly Pomona promotes the policy goals of the California Master Plan for Higher Education in advancing equity for economically and historically disadvantaged groups. Many of the existing studies covered in the literature review that analyzed higher education outcomes for these groups looked solely at admissions or first-year GPA as success metrics. This study examined educational life-cycle outcomes over a six-year period so as to provide a more comprehensive measure of higher education success.

A cohort of Cal Poly Pomona College of Business Administration first-time freshman (FTF) applicants was chosen as the sample set. The College of Business Administration has an applicant pool which is demographically similar to the university overall, and the sample size was sufficient to provide robust analysis. This was also a sample of convenience due to the difficulty of obtaining the type of admissions and student outcomes data used in this study.

Study Design

In this non-equivalent control group study, groups with differing outcomes (dependent variables) were examined, and correlational statistics were employed to examine possible relationships with factors (independent variables) identified in the literature as likely to have caused the different outcomes. The null hypothesis was that no significant correlations existed.

The primary advantages of this study design are short duration and large sample size due to its use of historical student data. The primary disadvantage of this study

design is that correlational studies offer weaker evidence for causational relationships than experimental and quasi-experimental designs can provide.

Three dependent variables were chosen to measure applicant success:

- Admission;
- Graduation within six years; and
- Higher Cal Poly cumulative grade point average (GPA.)

Admission is defined by the university and by this study as an Admit Decision of Administrative Withdrawal, Applicant Withdrawal, Admit, or Matriculation. Graduation within six years is defined by this study as conferment of any undergraduate degree by Cal Poly within six calendar years of the admission term. Cal Poly cumulative GPA is the average grade for all courses taken at Cal Poly. The independent variables in this study are:

- High school GPA;
- SAT Composite Score; and
- Tier 1 local status.

The control variables are:

- Household income;
- Hispanic status; and
- Gender.

High school GPA and SAT Composite score are the two components of the eligibility index used to determine which applicants are admitted. The CSU accepts the SAT Reasoning Test only (formerly SAT I) and does not consider SAT Subject Tests (formerly SAT II). SAT Composite Score is the sum of the scores for the verbal and math

components. Tier 1 local status signifies applicants coming from a specific list (Appendix B) of local high schools which are given preferred admission status. Household income, Hispanic status, and gender are three factors identified in the literature as signifying potentially under-represented groups.

Applicant Data Extract

There was no existing campus report which provided the data necessary for this study, so a custom report was created for this purpose. The report, created in the campus student information system managed by campus central computing, queried the campus Data Warehouse archive. Extracted data fields included demographic information such as gender, ethnic group, and mailing address, administrative information such as application and enrollment results, and academic outcome data such as cumulative GPA and degree earned (see Appendix A for a full list).

In addition to these fields, six Boolean (1 for yes and 0 for no) computed variables were added to signify the following: admitted; enrollment beginning in the term of this application; degree completion within six years; degree completion after six years; whether the student dropped out prior to completion; and whether the student was still enrolled during either Winter or Spring 2015.

In order to obtain enough academic data to calculate six-year completion rates, the data extract was run for Fall 2008 applicants, and 3,605 rows were extracted on March 4, 2015 to an Microsoft Excel file for formatting and geocoding.

Median Household Income

One of the most critical requirements for this study was the analysis of household income as a control variable. In addition to data for gender, ethnic group and academic

success indicators that was available via the applicant data extract, there needed to be some way to gauge the socio-economic status of each applicant. Because this information does not exist in the campus student information system used to track applicants, this data had to be pulled in from a separate source.

Free Application For Student Aid (FAFSA) is the application used by most universities to determine eligibility for financial aid, and FAFSA data from applicants was considered as a possible source of household income data. Nearly 80 percent of Cal Poly Pomona's first-time-freshmen applicants file a FAFSA, but there are numerous disadvantages to using this data. FAFSA financial data is protected under the Family Educational Rights and Privacy Act (FERPA) and would have been difficult to obtain. Further, FAFSA household income data has skewness and reporting bias problems, and FAFSA completion has been show to correlate with both household income and college attendance (Feeny & Heroff, 2013). Ultimately, these issues and the confounding effect they would have had on this study's results suggested finding another data source.

Surrogate Economic Data

The novel approach employed by this study was to use the median household income for an applicant's census tract as a surrogate for the applicant's actual household income. The Census Bureau provides median household income figures for each census tract with one year, three year, and five year running averages as part of the American Community Survey (ACS.) ACS reports can be customized on the American Factfinder website and can be downloaded in Microsoft Excel format, so the data is straightforward to obtain and use (United States Census Bureau, 2015). The Census Bureau calculates

and provides margins of error and, because the estimates are generated from random samples, sample bias is minimized.

For this survey, ACS 5 year averages from 2010 were used, providing median household income over the 2006-2010 period for each census tract in California. Data from 2010 was chosen due to the Fall 2008 applicant cohort falling directly in the middle of the aggregation range as well as for maintaining consistent census tract boundaries between ACS data and Census Geocoder tract matching.

Geocoding

The next step was to use the Census Geocoder website to correlate ACS median household income data with individual applicants. The Census Geocoder website provides a tool for batch lookup of census tract geographies based on mailing address (United States Census Bureau, 2015). The tool is limited to a maximum of 1,000 addresses at a time, so the applicant data file was separated into four parts for conversion. Comma separated value (CSV) files containing a sequentially generated applicant number and applicant mailing address were created and used as input for the Census Geocoder tool. The 2010 census tract boundary was chosen as the benchmark for consistency with the ACS household income data. Geocoder results files were then aggregated, sorted, and merged into the applicant data file.

Among 3,605 applicants, 3,336 were successfully batch geocoded using this method. An additional 163 applicants were successfully geocoded using the manual single-address form submission page on the Census Geocoder website. This was accomplished by looking up the address on Google Maps and then using the latitude and longitude from Google Maps as input for the Census Geocoder web form

(https://maps.google.com). The 106 applicants who could not be geocoded to California census tracts consisted of:

- No address (4);
- Non-US address (17);
- Non-California address (36);
- Military APO address (2);
- Post office box (46); and
- Address which could not be resolved by Google Maps (1)

Non-California addresses were not used for the socioeconomic analysis because it falls outside the discussion of the mandate provided by the California Master Contract for Higher Education. Post office boxes were not used for the socioeconomic analysis because large income gradients were observed across areas served by a single post office which would cause a large increase in margin of error.

Sanitizing

After census tract geography information was merged into the applicant data file, the columns containing street address, city, state, zip code, and country were deleted from the file. All data extracts and CSV files containing street addresses were also deleted, and the flash drives on which they had been stored were wiped using a DoD 5220.22-M 7-pass data sanitizing process as implemented by the DBAN open source software project.

Data File Merging

Having converted applicant street addresses into census tract geographies and retrieved ACS median household income data, the next step was to associate the two in one data file. The ACS data extract was imported into the applicant data file in Microsoft

Excel, and the VLOOKUP function was used to add the Median Household Income and Median Household Income Margin of Error to the applicant data. Every row of applicant data that had been successfully geocoded as described previously now included an associated median household income and median household income margin of error.

Summary

To evaluate the success with which Cal Poly Pomona promotes the goals of the California Master Plan for Higher Education in advancing equity for economically and historically disadvantaged groups, a cohort of College of Business Administration first-time freshman (FTF) applicants were analyzed in this study. The following dependent variables were used: admission, graduation within 6 years, and higher Cal Poly cumulative GPA. The following independent variables were used: high school GPA, SAT score, and Tier 1 local status. The control variables were household income, Hispanic status, and gender. My contribution to this area of research is the use of Census Bureau median household income data as a surrogate for applicant household income, which was not easily obtainable. In the next chapter, the analysis will determine if any of the control variables influence an applicant's chance of admission and if any of the independent or control variables influence an applicant's chance of graduating within 6 years or having a higher Cal Poly cumulative GPA.

CHAPTER 4

ANALYSIS

With all of the dependent and independent variables in one data file, the three null hypotheses were tested. The assumptions were:

- There are no control variables correlated with an applicant's chance of admission to the university;
- There are no independent or control variables correlated with an enrolled student's cumulative GPA; and
- There are no independent or control variables correlated with an enrolled student's chance of graduating within 6 years.

Prior to analysis, three dummy variables, isTier1, isHispanic and isFemale, were created for linear and logistic regression analysis. Computed variables created in the data extract report: Admitted; Enrolled; and Grad6 were also used for filtering and regression analysis.

The analysis consisted of two phases: descriptive and inferential. The descriptive analysis provided an overview of the data and a comparative look at the dependent, independent, and control variables. The inferential analysis consisted of bivariate correlation analysis to determine which variables are inter-related as well as linear and logistic regressions to obtain multivariate models for each dependent variable.

Descriptive

Initial analysis of the 3,605 applicants to the College of Business Administration in Fall 2008 provided a general overview of the sample sizes available for various levels

of analysis. Of the 3,605 applicants, 1,500 students (41.61 percent) were admitted. Of those 1,500 admitted students, 334 (22.27 percent) enrolled beginning in Fall 2008.

Once enrolled, nearly 60 percent of students graduated in 6 years and another 1.8 percent graduated in more than 6 years (Figure 1). Just over one-third have left Cal Poly Pomona and the remaining 4.19 percent were still enrolled when data was collected. This data doesn't explain why 114 students from this cohort left Cal Poly Pomona. Among them, 72.6 percent had less than 2.0 GPA and 10.4 percent had greater than 3.0 GPA.

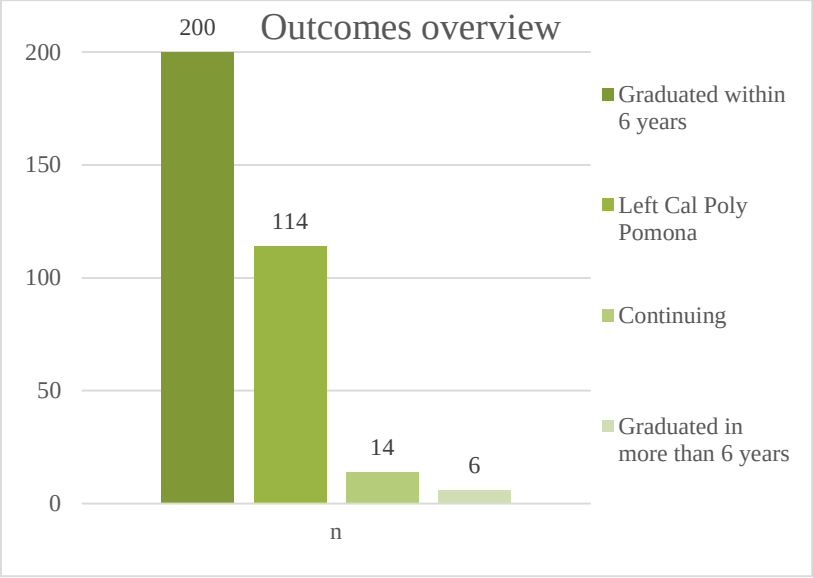

Figure 1. Fall 2008 cohort outcomes.

Applicants

Though students residing in the local area for Cal Poly Pomona (Tier 1 feeder school list can be found in Appendix B) comprised only 21.3 percent of applicants, they made up 48.2 percent of enrollees (Figure 2). Part of this large difference can be explained by the admissions bias in favor of local applicants. For the Fall 2008 application period, Cal Poly Pomona was impacted at the institutional level for new freshman applicants, making it significantly harder for non-local applicants to be

admitted to any degree program on campus (California State University Office of the Chancellor, 2007).

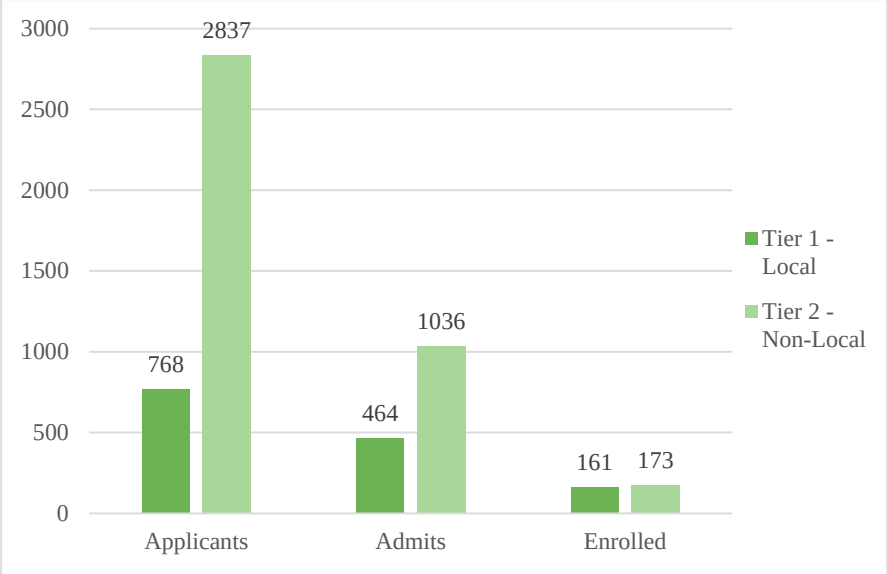

Figure 2. Admissions counts by Tier 1 local vs Tier 2 non-local status.

The geographic distribution of the non-local ("Tier 2") applicants was primarily from the more distant areas of the three counties which intersect near Cal Poly Pomona – western Los Angeles, eastern San Bernardino, and southern Orange Counties. The remainder of the non-local applicants are largely from the San Diego and San Francisco metropolitan areas.

The geographic distribution of the local ("Tier 1") applicants, when plotted on a map (Figure 3), was somewhat more densely clustered in the San Gabriel Valley suburban communities, between Alhambra to the West and Claremont to the East. Only slightly less dense were applicants from an area encompassing much of Los Angeles and Orange Counties. Interestingly, this area included California State University campuses in Northridge, Dominguez Hills, Los Angeles, and Fullerton. The Cal Poly Pomona College

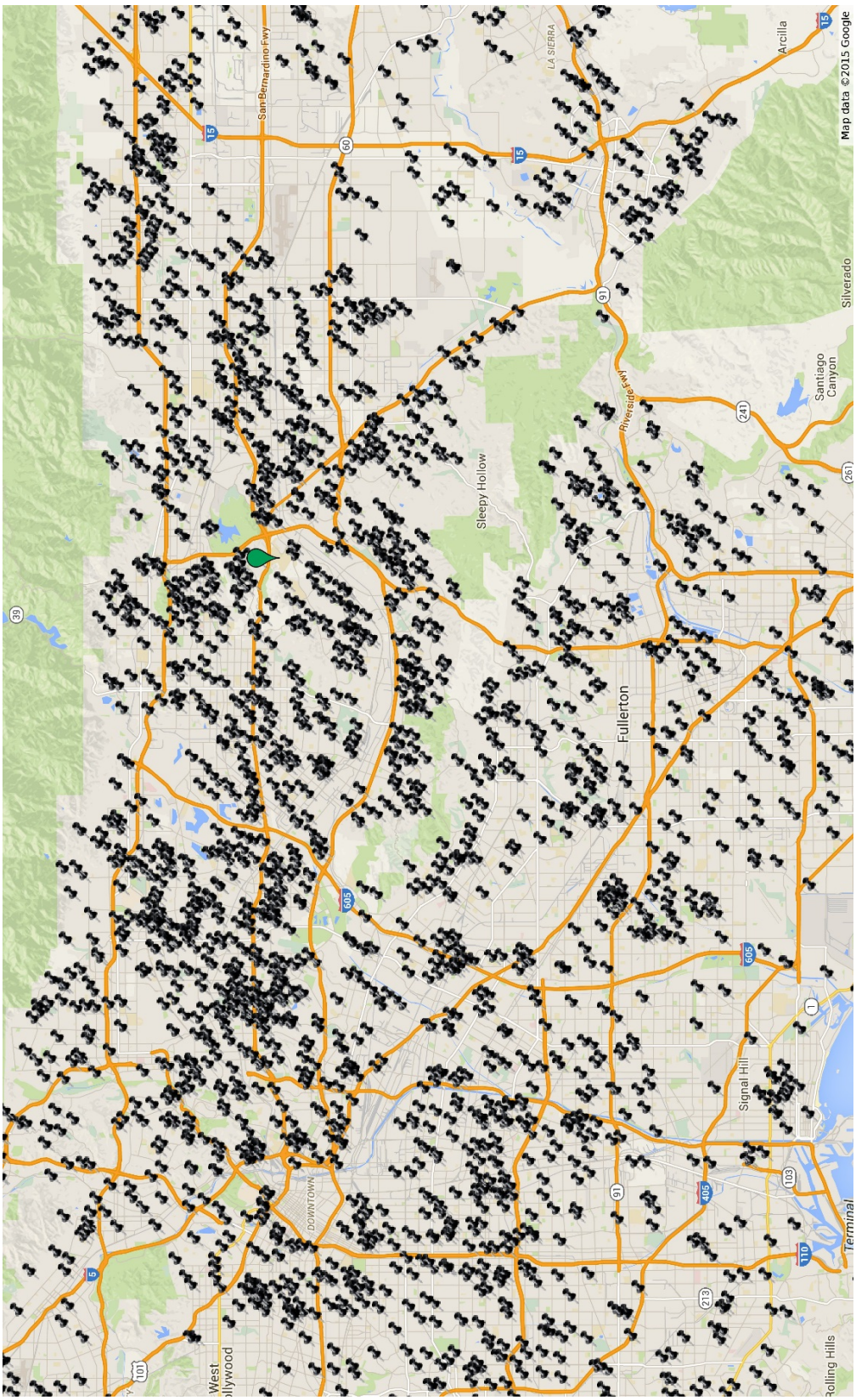

Figure 3. Distribution of applicants from the region surrounding Cal Poly.

of Business Administration appears to have been attracting significant attention from high school graduates throughout the region.

An interesting result that was not expected based on the literature review was that female students enrolled at a rate significantly lower than males (Figure 4). Females were 46.6 percent of the applicant pool and 48.6 percent of those admitted, but comprised only 41.9 percent of enrollees.

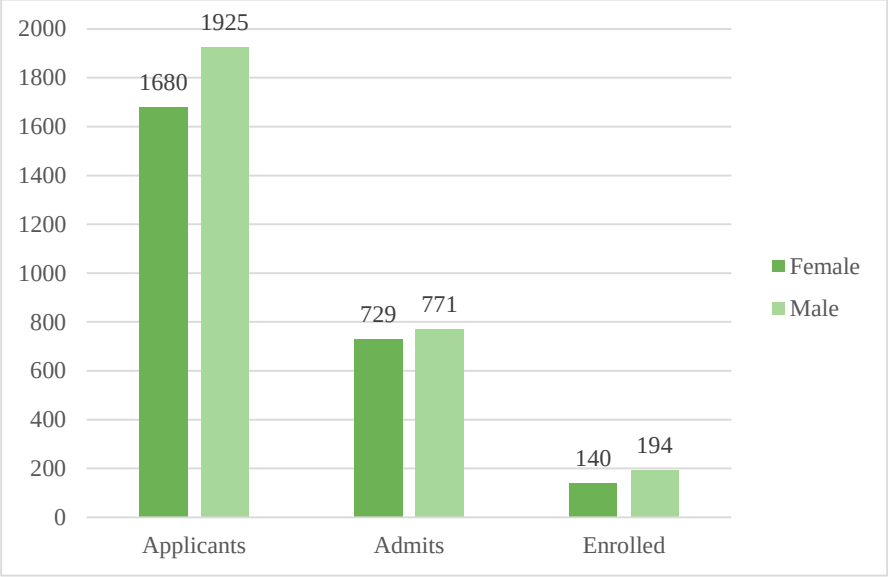

Figure 4. Admissions counts by gender.

Among ethnic groups, Blacks, Latinos, and Pacific Islanders were all less-represented in the admit pool (Table 1) than in the applicant pool. Black and Latino applicants both had significantly lower admission rates (25.8 percent and 29.2 percent, respectively) than other ethnic groups. Admissions counts for under-represented minorities as a group are depicted in Figure 5.

Table 1

Fall 2008 Applicant Ethnic Group

Ethnic Group	Applied %	Admitted %	Enrolled %
Native American	0.6%	0.7%	0.9%
Asian	33.0%	41.2%	33.2%
Black	6.0%	3.7%	4.5%
Latino	35.6%	25.0%	29.9%
Pacific Islander	0.7%	0.5%	0.6%
Not Specified	6.0%	5.3%	6.6%
White	17.9%	23.5%	24.0%
Totals	100%	100%	100%

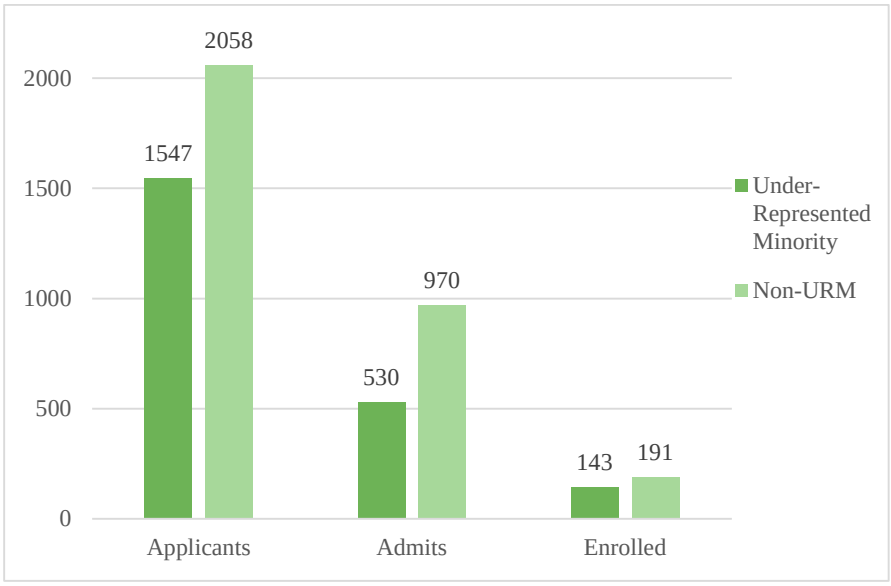

Figure 5. Admissions counts by minority status.

Native Americans comprised a very slightly larger share of the admit pool than the applicant pool, Whites significantly larger, and Asians 8.2 percent larger. The much higher admission rate for Asian applicants did not translate into enrollment share, however, as Asians were the most likely to decline an offer of admission. All other groups comprise a larger share of those enrolled than they made up in the admitted pool.

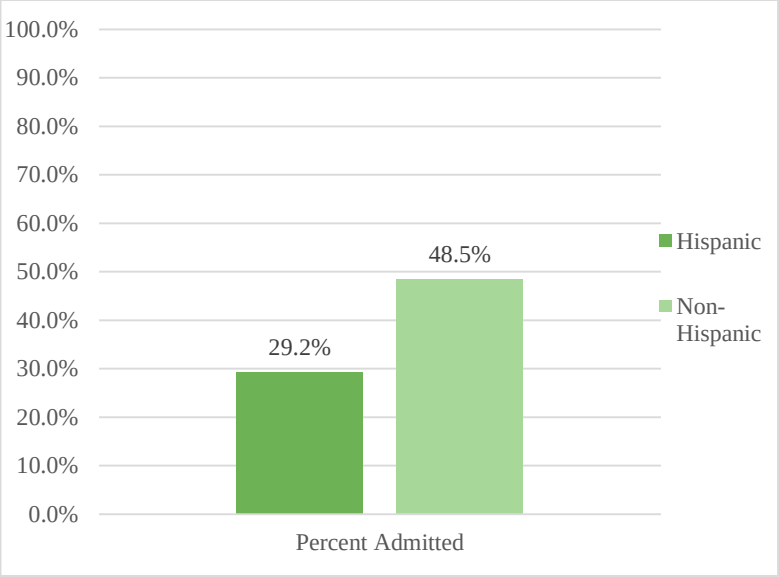

Figure 6. Percent admitted by Hispanic status.

The admission rate for Hispanic students was 29.2 percent versus 48.5 percent for non-Hispanic students (Figure 6). This single statistic demonstrates the gap between Cal Poly Pomona's Hispanic enrollment and a level which would match the Hispanic presence in the surrounding community.

As found in the literature, the applicants living in census tracts with the lowest median household income had the lowest admission rate. The relationship between median household income and admission rate is relatively linear until it levels off at the $80-100,000 income level and above (Figure 7). Applicants in the top two income quintiles were more than twice as likely to be admitted as those in the lowest quintile.

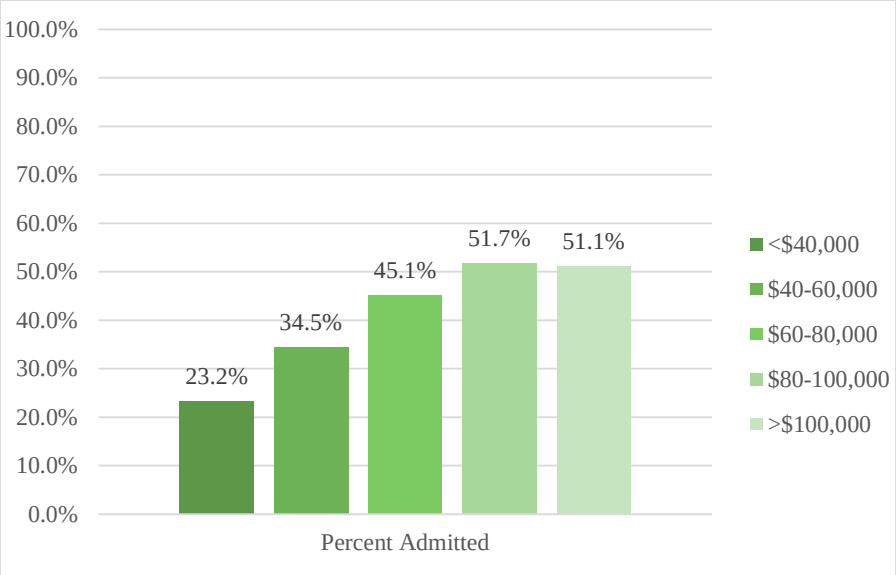

Figure 7. Percent admitted by census tract median household income.

Outcomes

Hispanic students were significantly less likely to graduate in 6 years than students from other ethnic groups at 53.0 percent vs 62.8 percent (Figure 8). This finding is consistent with the literature regarding completion rates for Hispanic students.

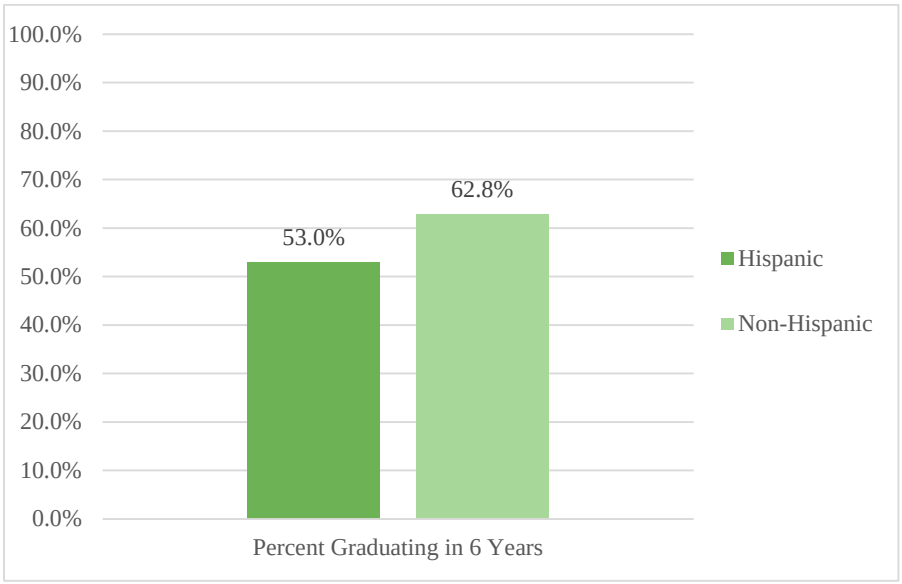

Figure 8. Percent graduating in 6 years by Hispanic status.

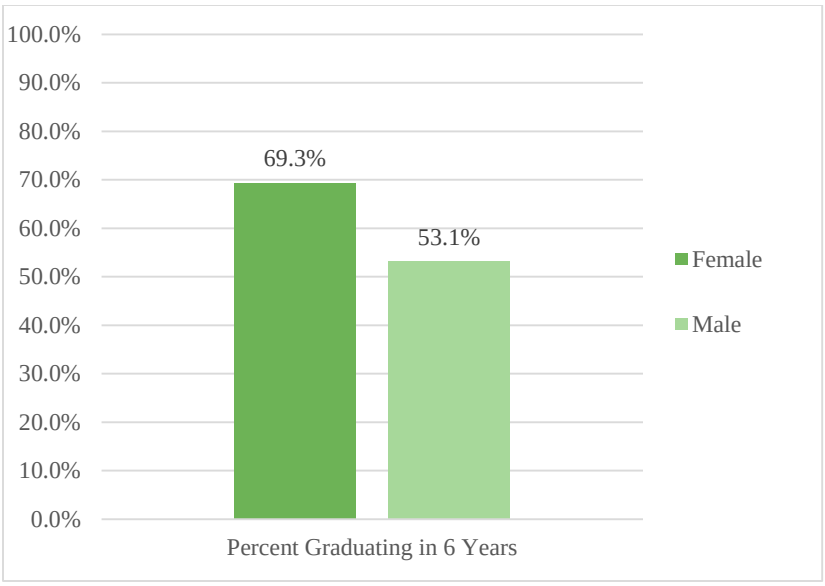

Figure 9. Percent graduating in 6 years by gender.

Similarly, male students were less likely to graduate in 6 years than female students at 53.1 percent vs 69.3 percent (Figure 9). These findings are consistent with Princiotta et al. (2014) regarding gender and completion rates.

Inferential

The first inferential analysis conducted was simple bivariate correlations. Bivariate correlations are summarized in tables 2 and 3 and full SPSS output can be found in Appendix C.

Table 2 shows significant (Sig. less than .05) correlations between the dependent variable admitted and all independent and control variables. The correlations between admitted and SAT, HS GPA, and Tier 1 are expected as these are the explicit criteria for admission. The rest of the correlations in table 2 show effects similar to those described in the literature. Hispanic, male, and lower income applicants are all significantly correlated with a lower percentage of admission. The Pearson value shows the relative strength of the correlations with negative values indicating an inverse correlation.

Table 2

Bivariate Correlations for Dependent Variable: Admitted

Independent Variable	HS GPA	SAT Composite	dummy Hispanic	dummy Female	dummy Tier 1	Household Income
Admitted						
Pearson Correlation	.418**	.410**	-.188**	.033*	.199**	.185**
Sig. (2-tailed)	.000	.000	.000	.045	.000	.000
n	3591	2319	3605	3605	3605	3499

Note: The dependent variable is coded as 0=not admitted and 1=admitted.
**. Correlation is significant at the 0.01 level. *. Correlation is significant at the 0.05 level

Table 3

Bivariate Correlations for Dependent Variables: Dummy Degree in 6; CPP Cumulative GPA

Independent Variable	HS GPA	SAT Composite	dummy Hispanic	dummy Female	dummy Tier 1	Household Income
Dummy Degree in 6						
Pearson Correlation	.300**	.085	-.092	.163**	.007	.057
Sig. (2-tailed)	.000	.127	.094	.003	.895	.304
n	333	323	334	334	334	323
CPP Cumulative GPA						
Pearson Correlation	.410**	.109	-.035	.112*	.017	.103
Sig. (2-tailed)	.000	.051	.521	.042	.757	.064
n	332	322	333	333	333	322

Note: The dependent variable is coded as 0=no degree in 6 and 1=degree in 6.
**. Correlation is significant at the 0.01 level. *. Correlation is significant at the 0.05 level

Table 3 lists the correlations for the dependent variables degree in 6 and Cal Poly cumulative GPA. In this table, the only significant (Sig. less than .05) correlations are for high school GPA and the dummy variable for Female gender. Both of these independent variables are positively associated with both degree in 6 years and CPP cumulative GPA.

Notably, this data does not show a significant correlation between SAT Composite and either 6-year completion or cumulative GPA, though the latter was nearly significant at p=.051. HS GPA was the only strong bivariate predictor of both 6-year completion and cumulative GPA (Figure 10).

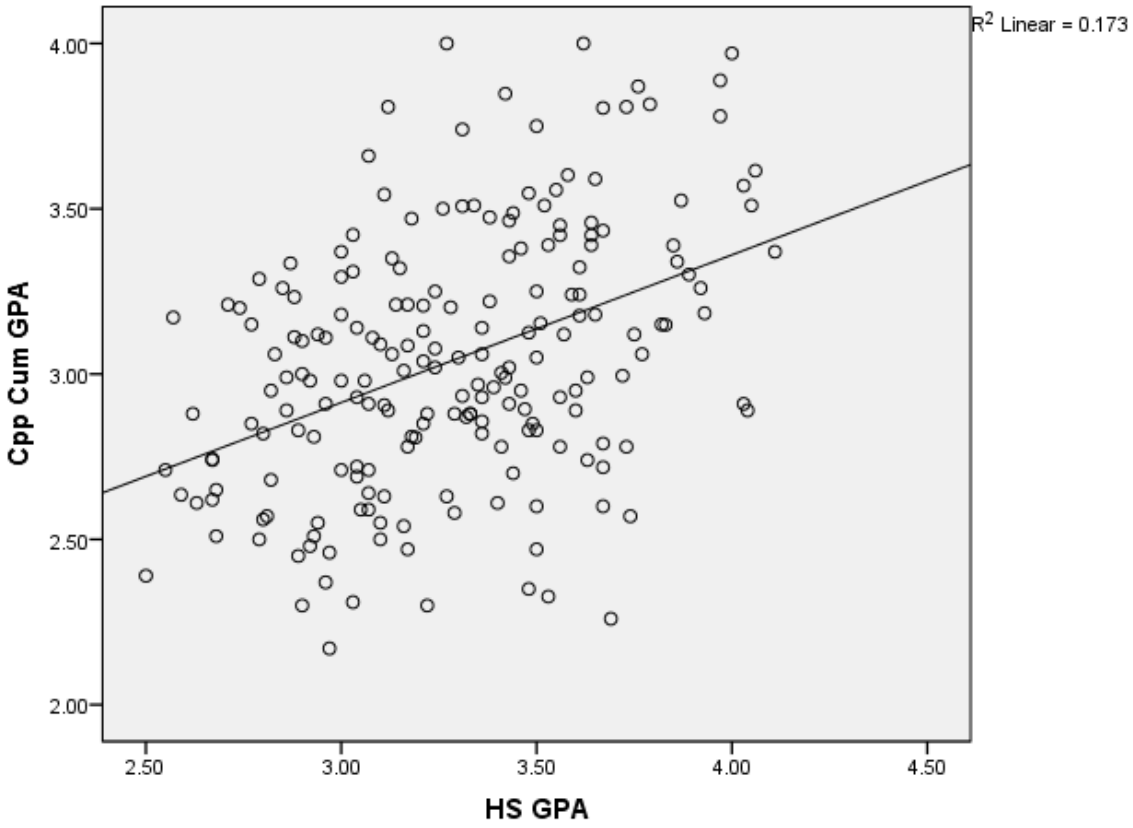

Figure 10. CPP cumulative GPA vs high school GPA.

Notable bivariate correlations among the independent variables (Appendix C) include those between high school GPA, SAT, female, Hispanic, and household income. These results are similar to the findings in the literature.

For female applicants there were opposing effects of similar strength correlating with higher GPA yet lower SAT. Hispanic status correlated with both lower high school GPA and lower SAT scores, though the relationship was much stronger for SAT than GPA. Similarly, lower household income correlated with both lower high school GPA and lower SAT scores (Figure 11), with a much stronger relationship for SAT than GPA.

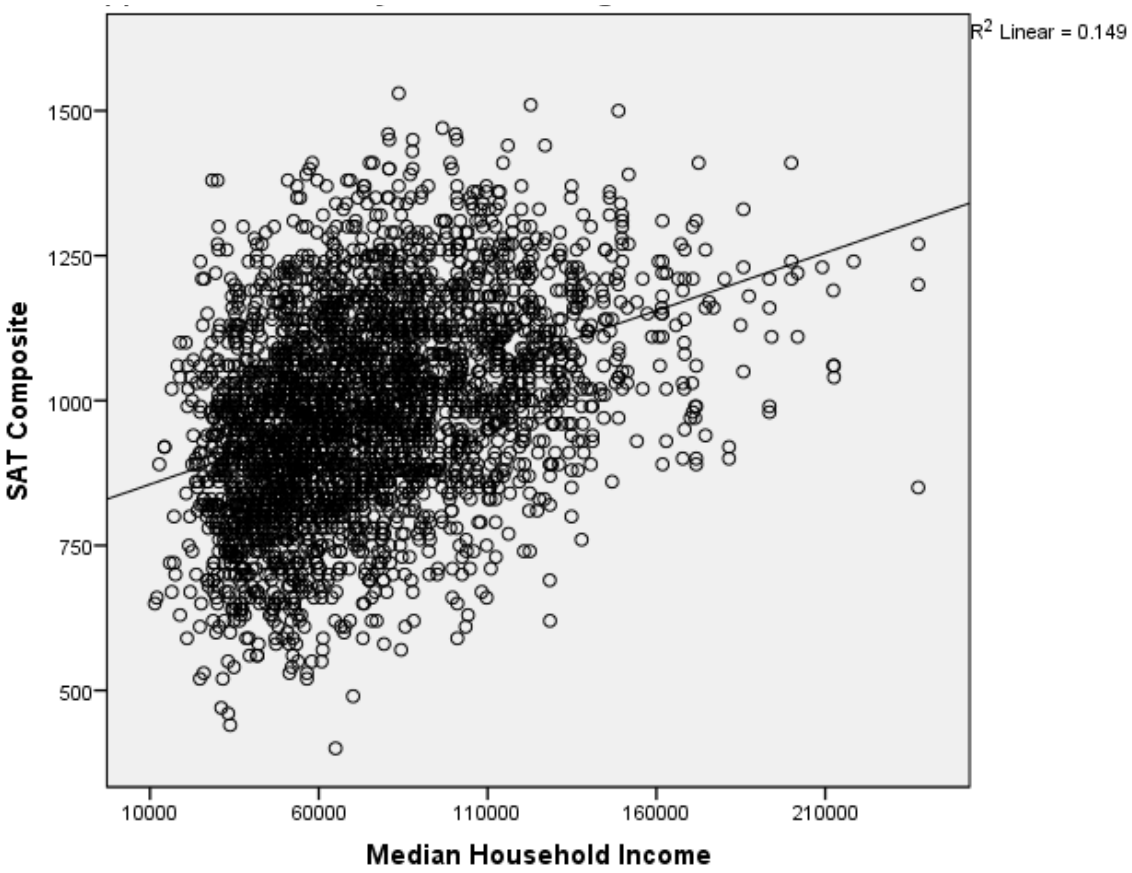

Figure 11. SAT composite vs median household income for applicants.

Logistic and Linear Regression

Logistic regression analysis for admitted is summarized in Table 4 with full SPSS output in Appendix C. The Significance (p) is the chance of the apparent correlation occurring randomly. The Wald statistic is a standardized estimate of the significance of each of the model's components. The independent variables, as expected, were significant in the resulting regression model. From strongest to weakest in standardized effect are HS GPA; Tier 1; and SAT Composite. Control variables female and household income were not significant in the model, as expected. Per the literature, these control variables impact admission through GPA and SAT and are not expected to affect admission directly.

Table 4

Logistic Regression Analysis: Admitted

Independent Variable	B	S.E.	Wald	p	Odds Ratio
HS GPA	3.585	.189	358.338	.000	36.067
SAT Composite	.006	.000	147.494	.000	1.006
Household Income	.000	.000	3.092	.079	1.000
Hispanic	-.400	.140	8.200	.004	.670
Female	.117	.124	.892	.345	1.124
Tier 1	2.462	.176	195.974	.000	11.729
Constant	-16.332	.757	465.191	.000	.000
Model Statistics					
Model X^2	1202.854	p. < .001			
Cox & Snell R^2	.416				
n	2234				

Note: The dependent variable is coded as 0=not admitted and 1=admitted.

It is very notable that Hispanic status is a significant (p=.004) predictor of admission when SAT composite, high school GPA, and Tier are held constant. This finding indicates that a Hispanic applicant is less likely to be admitted than a non-Hispanic applicant with identical GPA, SAT, and Tier.

The code “Application Received” is present for 6.9 percent of applicants and means the application was received, is under review, and may require additional documents for an admit decision to be reached. This was the only admission decision reason value that fits the multiple criteria of admission denial, lack of relationship to academic qualifications or test scores, and having Hispanic over-representation.

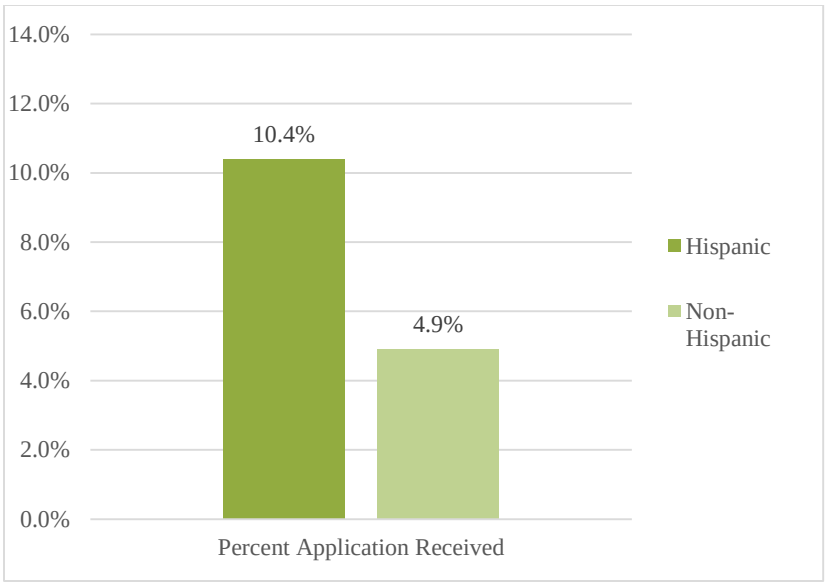

Figure 12. Percent with application received by Hispanic status.

The dramatically different percentages of applications with a decision reason of Application Received for Hispanic vs non-Hispanic students can be seen in Figure 12. Hispanic students were more than twice as likely to have an application with incomplete documentation, resulting no admit decision being made.

Even this stark difference between Hispanic and non-Hispanic applicants in having no admit decision made is not enough to explain the 19.3 percent gap in overall admission rate for Hispanic applicants (Figure 6). To further examine this gap, an additional linear regression for SAT Composite score was applied. The resulting regression model is summarized in Table 5 and quite strong with an adjusted R square of .320 meaning these independent variables describe about one-third of the total variation in SAT scores. Significant predictors are HS GPA; household income; Hispanic status; and gender (all with $p<.001$).

These predictors were all as found in the literature, including the relative strength of the effects. HS GPA was narrowly the largest contributor with a Beta strength value

of .331, household income and Hispanic status were approximately tied and just behind GPA, while gender was the fourth-largest but still significant contributor.

Table 5

Linear Regression Analysis: SAT Composite

Independent Variable	B	S.E.	Beta	t	p
HS GPA	120.538	6.501	.331	18.543	.000
Household Income	.001	.000	.262	14.071	.000
Hispanic	-90.278	6.935	-.242	-13.018	.000
Female	-49.909	6.169	-.144	-8.090	.000
Constant	571.089	22.143		25.791	.000
Model Statistics					
Model R^2	.321	p. < .001			
Adjusted R^2	.320				
Estimate S.E.	142.363				
n	2234				

A logistic regression for degree in 6 years was executed and then summarized in Table 6 and with full output in Appendix C. The regression model had modest strength with a Cox & Snell pseudo R square of .107. The only statistically significant predictor in the model was high school GPA (p<.001), with gender (Female) nearly significant (p=.061). As found in the literature, SAT Composite was not a statistically significant predictor of 6-year completion despite being used as an admission requirement.

Table 6

Logistic Regression Analysis: Degree in 6 Years

Independent Variable	B	S.E.	Wald	p	Odds Ratio
HS GPA	1.755	.371	22.360	.000	5.784
SAT Composite	.001	.001	.584	.445	1.001
Household Income	.000	.000	1.028	.311	1.000
Hispanic	-.148	.291	.259	.611	.862
Female	.492	.263	3.499	.061	1.636
Tier 1	.110	.259	.181	.671	1.117
Constant	-6.483	1.528	17.993	.000	.002
Model Statistics					
Model X^2	35.113	p. < .001			
Cox & Snell R^2	.107				
n	311				

Note: The dependent variable is coded as 0=no degree in 6 years and 1=degree in 6 years.

Next, a linear regression for CPP cumulative GPA was applied. The model was moderately strong with an adjusted R square of .172 and included the significant predictors high school GPA (p<.001) and household income (p=.032). Household income was not only significant in this model but also a fairly strong component, at nearly 30 percent of the t score for high school GPA (2.159 vs 7.634). The unstandardized beta for household income indicates that a $23,552 increase in median household income translates to an expected CPP cumulative GPA increase of 0.1.

Other research, particularly Geiser (2001), has found SAT I Composite scores to be comparatively weak but still significant predictors of postsecondary GPA. In this data set, however, SAT I is not a significant predictor of CPP cumulative GPA.

Table 7

Linear Regression Analysis: Cumulative GPA

Independent Variable	B	S.E.	Beta	t	p
HS GPA	1.067	.140	.402	7.634	.000
SAT Composite	.000	.000	.066	1.079	.282
Household Income	4.246E-6	.000	.121	2.159	.032
Hispanic	.079	.119	.038	.661	.509
Female	.099	.106	.051	.933	.352
Tier 1	.040	.105	.021	.380	.705
Constant	-1.727	.586		-2.950	.003
Model Statistics					
Model R^2	.188	p. < .001			
Adjusted R^2	.172				
Estimate S.E.	.87538				
n	311				

Summary

Significant evidence was found for rejecting the null hypotheses:

- Hispanic status is a significant but weak predictor of admission, even when holding SAT, high school GPA, and local/non-local tier constant
- High school GPA is a significant predictor of 6-year completion
- Both high school GPA and household income are significant predictors of CPP cumulative GPA

Additionally, both Hispanic status and household income were found to be significant and strong predictors of SAT score but not significant predictors of 6-year completion rates. Overall admission rates for the highest two income quintiles were more than double that of the lowest income quintile. Overall admission rates for non-Hispanic applicants was 66 percent higher than for Hispanic applicants.

CHAPTER 5

CONCLUSION

This study found the following significant results:

- Hispanic and low-income applicants were less likely to have been admitted due to significant and strong associations with lower SAT scores;
- Hispanic applicants were less likely to have been admitted even when holding GPA, SAT, and tier constant due to incomplete applications;
- High school GPA was the only significant predictor of 6-year completion; and
- High school GPA and household income were the only significant predictors of Cal Poly cumulative GPA.

This study reaffirmed previous literature which found that California's public higher education institutions are failing to meet the policy goals of the California Master Plan for Higher Education in providing equivalent access to socio-economically disadvantaged and historically underrepresented groups. In this study, Cal Poly Pomona College of Business Administration applicants were significantly less likely to be admitted if they were Hispanic or low-income.

This study found that Hispanic applicants were more than twice as likely to have incomplete applications as non-Hispanic applicants. However, the data used for this study did not have information about the specific admission requirements which had not been met.

Additionally, this study reaffirmed previous literature finding that SAT Reasoning Test scores are, at best, a weak predictor of university success. In this study, they did not significantly predict success outcomes at all. This study also reaffirmed and extended

previous literature which examined the outsized impact that using SAT scores for admission has on socio-economically disadvantaged and historically under-represented groups (Table 5). This research found that use of the SAT Reasoning Test for admissions was the largest systemic deterrent to access for low-income and Hispanic applicants in the Fall 2008 College of Business Administration applicant cohort.

Policy Recommendations

In this study, Hispanic applicants were more than twice as likely as non-Hispanic applicants to receive no admission decision due to incomplete applications. Further outreach by admissions counselors targeting all applicants with incomplete documentation is expected to increase the percentage of Hispanic applicants being admitted to Cal Poly Pomona.

One possible scenario would be for the Admissions department to offer several prospective student tours specifically marketed to first-time freshman applicants with incomplete applications. The tours could be timed to coincide with one-on-one sessions with admissions counselors in a campus computer lab. Applicants could log in to view admissions requirements that have not yet been completed, and counselors could assist them with the process of finishing their applications.

This study faced shortcomings in the availability and standardization of the data necessary to analyze student access and success. Ideally, the Chancellor's office would create a student access and success data model for the entire system, and all campuses would generate reports based on these standardized definitions. This would allow administrators and researchers to compare access and success across colleges, campuses,

or regions as well as providing an outcomes assessment mechanism for new programs established to promote student access or success.

The inclusion of the SAT Reasoning Test in the California State University eligibility index, used to rank and admit students into the university, is often described by CSU literature as optional. The CSU admissions handbook states that students with a high school GPA over 3.0 are eligible with no minimum SAT score (California State University Office of the Chancellor, 2008; California State Polytechnic University, Pomona, 2008). Despite this, there is a recommendation that all applicants take the SAT, regardless of high school GPA. In the current fiscal climate, academic programs and entire universities are frequently impacted. Impaction causes the admissions process to become more selective than the minimum CSU eligibility requirement and makes the SAT much less optional for applicants (California State University Office of the Chancellor, 2007; California State Polytechnic University, Pomona, 2008)

Why use an admission exam which is both a poor predictor of student success and is detrimental to providing access to public higher education for disadvantaged groups? The literature supports eliminating standardized testing as an admission requirement entirely, but if that is not a palatable option, there are better tests. As discussed in the literature review, the SAT Writing Test (previously SAT II) has been shown to have less correlation with socio-economic status and to be nearly as good a predictor of postsecondary success as high school GPA (Geiser & Santelices, 2007; Geiser & Studley, 2001).

As suggested by Johnson (2010) the California State University could reduce the minimum eligibility threshold so that more students are able to attend CSU schools,

which would have a positive impact on ethnic and socio-economic diversity in the system due to the gradient of under-represented groups across the eligibility deciles. This would require not only closing the current funding gap but also allocating funds for a significant enrollment increase. It would, however, provide the additional public policy benefit of helping to meet the demand for new college graduates in California, which currently outpaces CSU and UC graduate counts.

Limitations

The largest limitation of this study is that correlational designs provide less evidence for causation than experimental designs. Given that a researcher cannot randomly assign applicants to various socio-economic backgrounds or ethnic groups, this was at least partially unavoidable.

Further, this study only considered applicants to one college at one CSU campus, so the results are therefore not necessarily valid for other campuses or even other colleges at the same university. Also, only one applicant cohort was studied, so this study provides no insight into trends in student access.

Lastly, this study's regression model for 6-year completion had a pseudo R square of .107 and the model for CPP cumulative GPA had an adjusted R square of .172. In both cases, these models are weak predictors of student success.

Future Research

The observed phenomenon of Hispanic applicants with no admit decisions at more than double the rate of non-Hispanic applicants suggests further research. If this result is repeatable at the campus or system level over multiple years, it would indicate

that the application process is itself a deterrent to access for the state's Hispanic high school graduates.

The SAT Reasoning Test (previously SAT I) is changing again beginning in spring 2016. As with previous changes, the new SAT is designed to address concerns with limitations of the old test. If standardized tests are still employed by the CSU as an admission criteria, additional research will be needed to see how the new test compares to the old with regard to impact on under-represented groups and predictive ability for postsecondary outcomes.

Another possible avenue for future research is to add qualitative data by conducting a survey of a random sample from a cohort of admitted students across the entire university. Combining the methodology in this study with data from administering a survey could improve the student success models as well as explain why students leave the university. This would also offer an opportunity to validate the surrogate economic data methodology employed by this study as self-reported household income could be compared with census tract median household income.

It would be useful to repeat this study with high school fixed effects such as college advising, academic rigor, and number of Advanced Placement courses offered as a control in the regression. The results would be a better description of the overall success factors for first-time freshmen students entering the CSU.

A study which randomly samples applicants across the entire California State University system would provide a more robust look at whether the effects observed in this study are local to Cal Poly Pomona or are consistent across the entire system. Such a

study could also include time series samples to provide insight into longer-term trends in disadvantaged student access and success in the CSU system.

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APPENDIX A

DATA EXTRACT – INCLUDED FIELDS

Academic Plan
Option Academic Career
Admit Term
Application Status
Student Type
Admit Decision
Tier
Source Institution
HS GPA
Address Line 1: Mail
Address Line 2: Mail
City: Mail
State: Mail
Zip Code: Mail
Country: Mail
Gender
Ethnic Group
Ethnicity
Citizenship Status
Citizenship Country
SAT Composite
Adegr Completion Term
Adegr Degree
Cpp Cum Gpa
Cterm Term Cd

APPENDIX B

LIST OF TIER 1 LOCAL SOURCE INSTITUTIONS

Alta Loma High	Arroyo High	Azusa High
Baldwin Park High	Bassett Senior High	Bishop Amat Memorial High
Bonita High	Chaffey High	Charter Oak High
Chino High	Chino Hills High	Claremont High
Colony High	Covina High	Damien High
Diamond Bar High	Diamond Ranch High	Don Antonio Lugo High
Don Bosco Tech Inst HS	Etiwanda High	Ganesha Senior High
Garey Senior High	Gladstone High	Glen A. Wilson High
Glendora High	Intl. Polytechnic High	John A. Rowland High
La Puente High	Los Altos High	Los Osos High
Lutheran High	Montclair High	Mountain View High
Nogales High	Northview High	Ontario Christian High
Ontario High	Pomona Catholic Girls High	Pomona Senior High
Rancho Cucamonga High	Ruben S. Ayala High	San Dimas High
Sierra Vista High	South Hills High	St. Lucy's Priory High
Upland High	Village Academy High	Walnut High
West Covina High	Western Christian	William Workman High

APPENDIX C

SPSS OUTPUT

		HS GPA	SAT Composite - Official	Hispanic	Female	Tier 1 Dummy Var	Median Household Income	Admitted
HS GPA	Pearson Correlation	1	.344**	-.097**	.163**	-.010	.062**	.418**
	Sig. (2-tailed)		.000	.000	.000	.530	.000	.000
	N	3591	2311	3591	3591	3591	3487	3591
SAT Composite - Official	Pearson Correlation	.344**	1	-.370**	-.120**	-.052*	.377**	.410**
	Sig. (2-tailed)	.000		.000	.000	.013	.000	.000
	N	2311	2319	2319	2319	2319	2240	2319
Hispanic	Pearson Correlation	-.097**	-.370**	1	.067**	.031	-.351**	-.188**
	Sig. (2-tailed)	.000	.000		.000	.059	.000	.000
	N	3591	2319	3605	3605	3605	3499	3605
Female	Pearson Correlation	.163**	-.120**	.067**	1	.004	-.112**	.033*
	Sig. (2-tailed)	.000	.000	.000		.814	.000	.045
	N	3591	2319	3605	3605	3605	3499	3605
Tier 1 Dummy Var	Pearson Correlation	-.010	-.052*	.031	.004	1	.057**	.199**
	Sig. (2-tailed)	.530	.013	.059	.814		.001	.000
	N	3591	2319	3605	3605	3605	3499	3605
Median Household Income	Pearson Correlation	.062**	.377**	-.351**	-.112**	.057**	1	.185**
	Sig. (2-tailed)	.000	.000	.000	.000	.001		.000
	N	3487	2240	3499	3499	3499	3499	3499
Admitted	Pearson Correlation	.418**	.410**	-.188**	.033*	.199**	.185**	1
	Sig. (2-tailed)	.000	.000	.000	.045	.000	.000	
	N	3591	2319	3605	3605	3605	3499	3605

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

		HS GPA	SAT Composite - Official	Hispanic	Female	Tier 1 Dummy Var	Median Household Income	Degree in 6	Cpp Cum Gpa
HS GPA	Pearson Correlation	1	.077	-.070	.143**	-.046	-.011	.300**	.410**
	Sig. (2-tailed)		.167	.203	.009	.407	.851	.000	.000
	N	333	322	333	333	333	322	333	332
SAT Composite - Official	Pearson Correlation	.077	1	-.325**	-.178**	-.269**	.318**	.085	.109
	Sig. (2-tailed)	.167		.000	.001	.000	.000	.127	.051
	N	322	323	323	323	323	312	323	322
Hispanic	Pearson Correlation	-.070	-.325**	1	-.078	.141**	-.236**	-.092	-.035
	Sig. (2-tailed)	.203	.000		.153	.010	.000	.094	.521
	N	333	323	334	334	334	323	334	333
Female	Pearson Correlation	.143**	-.178**	-.078	1	.055	-.112*	.163**	.112*
	Sig. (2-tailed)	.009	.001	.153		.318	.045	.003	.042
	N	333	323	334	334	334	323	334	333
Tier 1 Dummy Var	Pearson Correlation	-.046	-.269**	.141**	.055	1	.021	.007	.017
	Sig. (2-tailed)	.407	.000	.010	.318		.705	.895	.757
	N	333	323	334	334	334	323	334	333
Median Household Income	Pearson Correlation	-.011	.318**	-.236**	-.112*	.021	1	.057	.103
	Sig. (2-tailed)	.851	.000	.000	.045	.705		.304	.064
	N	322	312	323	323	323	323	323	322
Degree in 6	Pearson Correlation	.300**	.085	-.092	.163**	.007	.057	1	.676**
	Sig. (2-tailed)	.000	.127	.094	.003	.895	.304		.000
	N	333	323	334	334	334	323	334	333
Cpp Cum Gpa	Pearson Correlation	.410**	.109	-.035	.112*	.017	.103	.676**	1
	Sig. (2-tailed)	.000	.051	.521	.042	.757	.064	.000	
	N	332	322	333	333	333	322	333	333

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

```
LOGISTIC REGRESSION VARIABLES Admitted
  /METHOD=ENTER HSGPA SATCompositeOfficial MedianHouseholdIncome isHispanic
isFemale Tier1Dummy
  /CONTRAST (isHispanic)=Indicator(1)
  /CONTRAST (isFemale)=Indicator(1)
  /CONTRAST (Tier1Dummy)=Indicator(1)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	2234	62.0
	Missing Cases	1371	38.0
	Total	3605	100.0
Unselected Cases		0	.0
Total		3605	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Tier 1 Dummy Var	0	1702	.000
	1	532	1.000
Female	0	1200	.000
	1	1034	1.000
Hispanic	0	1536	.000
	1	698	1.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted		
			Admitted		Percentage Correct
			0	1	
Step 0	Admitted	0	0	849	.0
		1	0	1385	100.0
	Overall Percentage				62.0

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.489	.044	126.065	1	.000	1.631

Variables not in the Equation[a]

			Score	df	Sig.
Step 0	Variables	HSGPA	637.404	1	.000
		SATCompositeOfficial	376.176	1	.000
		MedianHouseholdIncome	33.537	1	.000
		isHispanic(1)	59.083	1	.000
		isFemale(1)	7.323	1	.007
		Tier1Dummy(1)	122.548	1	.000

a. Residual Chi-Squares are not computed because of redundancies.

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1202.854	6	.000
	Block	1202.854	6	.000
	Model	1202.854	6	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1764.262[a]	.416	.566

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted		
			Admitted		Percentage Correct
			0	1	
Step 1	Admitted	0	640	209	75.4
		1	174	1211	87.4
	Overall Percentage				82.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	HSGPA	3.585	.189	358.338	1	.000	36.067
	SAT Composite	.006	.000	147.494	1	.000	1.006
	Official Median Household Income	.000	.000	3.092	1	.079	1.000
	isHispanic(1)	-.400	.140	8.200	1	.004	.670
	isFemale(1)	.117	.124	.892	1	.345	1.124
	Tier1Dummy(1)	2.462	.176	195.974	1	.000	11.729
	Constant	-16.332	.757	465.191	1	.000	.000

a. Variable(s) entered on step 1: HSGPA, SATCompositeOfficial, MedianHouseholdIncome, isHispanic, isFemale, Tier1Dummy.

```
USE ALL.
COMPUTE filter_$=(Enrolled=1).
VARIABLE LABELS filter_$ 'Enrolled=1 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.
LOGISTIC REGRESSION VARIABLES Degreein6
  /METHOD=ENTER HSGPA SATCompositeOfficial MedianHouseholdIncome isHispanic
isFemale Tier1Dummy
  /CONTRAST (isHispanic)=Indicator(1)
  /CONTRAST (isFemale)=Indicator(1)
  /CONTRAST (Tier1Dummy)=Indicator(1)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	311	93.1
	Missing Cases	23	6.9
	Total	334	100.0
Unselected Cases		0	.0
Total		334	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Tier 1 Dummy Var	0	158	.000
	1	153	1.000
Female	0	183	.000
	1	128	1.000
Hispanic	0	218	.000
	1	93	1.000

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			Degree in 6		Percentage
	Observed		0	1	Correct
Step 0	Degree in 6	0	0	126	.0
		1	0	185	100.0
	Overall Percentage				59.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.384	.116	11.056	1	.001	1.468

Variables not in the Equation[a]

			Score	df	Sig.
Step 0	Variables	HSGPA	27.229	1	.000
		SATCompositeOfficial	1.788	1	.181
		MedianHouseholdIncome	1.423	1	.233
		isHispanic(1)	2.544	1	.111
		isFemale(1)	5.354	1	.021
		Tier1Dummy(1)	.000	1	.998

a. Residual Chi-Squares are not computed because of redundancies.

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	35.113	6	.000
	Block	35.113	6	.000
	Model	35.113	6	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	384.764[a]	.107	.144

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Degree in 6		Percentage
	Observed		0	1	Correct
Step 1	Degree in 6	0	56	70	44.4
		1	40	145	78.4
	Overall Percentage				64.6

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	HSGPA	1.755	.371	22.360	1	.000	5.784
	SAT Composite Official	.001	.001	.584	1	.445	1.001
	Median Household Income	.000	.000	1.028	1	.311	1.000
	isHispanic(1)	-.148	.291	.259	1	.611	.862
	isFemale(1)	.492	.263	3.499	1	.061	1.636
	Tier1Dummy(1)	.110	.259	.181	1	.671	1.117
	Constant	-6.483	1.528	17.993	1	.000	.002

a. Variable(s) entered on step 1: HSGPA, SATCompositeOfficial, MedianHouseholdIncome, isHispanic, isFemale, Tier1Dummy.

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS BCOV R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT CppCumGpa
  /METHOD=ENTER HSGPA SATCompositeOfficial isFemale isHispanic
MedianHouseholdIncome Tier1Dummy.
```

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Tier 1 Dummy Var, HS GPA, Median Household Income, Female, Hispanic, SAT Composite - Official[b]	.	Enter

a. Dependent Variable: Cpp Cum Gpa

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.433[a]	.188	.172	.87538

a. Predictors: (Constant), Tier 1 Dummy Var, HS GPA, Median Household Income, Female, Hispanic, SAT Composite - Official

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.617	6	8.936	11.662	.000[b]
	Residual	232.185	303	.766		
	Total	285.802	309			

a. Dependent Variable: Cpp Cum Gpa

b. Predictors: (Constant), Tier 1 Dummy Var, HS GPA, Median Household Income, Female, Hispanic, SAT Composite - Official

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.727	.586		-2.950	.003		
HS GPA	1.067	.140	.402	7.634	.000	.968	1.034
SAT Composite - Official	.000	.000	.066	1.079	.282	.721	1.386
Female	.099	.106	.051	.933	.352	.903	1.107
Hispanic	.079	.119	.038	.661	.509	.832	1.202
Median Household Income	4.246E-6	.000	.121	2.159	.032	.852	1.174
Tier 1 Dummy Var	.040	.105	.021	.380	.705	.901	1.110

a. Dependent Variable: Cpp Cum Gpa

Coefficient Correlations[a]

Model		Tier 1 Dummy Var	HS GPA	Median Household Income	Female	Hispanic	SAT Composite - Official
Correlations	Tier 1 Dummy Var	1.000	.006	-.154	-.024	-.076	.260
	HS GPA	.006	1.000	.047	-.145	.025	-.098
	Median Household Income	-.154	.047	1.000	.074	.159	-.274
	Female	-.024	-.145	.074	1.000	.186	.218
	Hispanic	-.076	.025	.159	.186	1.000	.281
	SAT Composite - Official	.260	-.098	-.274	.218	.281	1.000
Covariances	Tier 1 Dummy Var	.011	9.161E-5	-3.168E-8	.000	-.001	1.045E-5
	HS GPA	9.161E-5	.020	1.292E-8	-.002	.000	-5.255E-6
	Median Household Income	-3.168E-8	1.292E-8	3.868E-12	1.548E-8	3.726E-8	-2.060E-10
	Female	.000	-.002	1.548E-8	.011	.002	8.865E-6
	Hispanic	-.001	.000	3.726E-8	.002	.014	1.285E-5
	SAT Composite - Official	1.045E-5	-5.255E-6	-2.060E-10	8.865E-6	1.285E-5	1.465E-7

a. Dependent Variable: Cpp Cum Gpa

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	HS GPA	SAT Composite - Official	Female	Hispanic	Median Household Income	Tier 1 Dummy Var
1	1	5.208	1.000	.00	.00	.00	.01	.01	.00	.01
	2	.742	2.649	.00	.00	.00	.14	.59	.00	.01
	3	.515	3.179	.00	.00	.00	.71	.13	.02	.00
	4	.445	3.419	.00	.00	.00	.01	.08	.00	.88
	5	.071	8.558	.01	.02	.01	.05	.07	.92	.01
	6	.013	20.062	.01	.38	.71	.07	.05	.05	.05
	7	.005	32.443	.98	.59	.27	.01	.07	.00	.04

a. Dependent Variable: Cpp Cum Gpa