Where do Community College Students want to Transfer to?: Essays Examining College Choice for Community College Transfer Students

By

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DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Education

in the

OFFICE OF GRADUATE STUDIES

of the

UNIVERSITY OF CALIFORNIA

DAVIS

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2021

ABSTRACT

This study examines the college choices for community college students who are seeking to transfer to a baccalaureate granting institution. I identified community college students who were eligible to transfer to a four-year college and I investigated where they wanted to pursue a bachelor's degree. I used theories from economics and sociology to examine how college choice occurs for community college transfer students. Specifically, I modeled the college choice process through the theories of Rational Choice, Bounded Rationality and Social Network Analysis. Previous studies examining college choice for community college transfer students have narrowly focused on the share of community college students at selective four-year colleges; these studies find that community college transfer students rarely attend selective four-year colleges, and most are public institutions. However, little is known about the factors that influence community college transfer students. By examining where community college students want to transfer to, this study contributes to our understanding of the stratification in the transfer pathway for community college students seeking to earn a bachelor's degree.

This study is situated in California which is an ideal location to understand college choice for community college transfer students due to the role that the state's open access postsecondary institutions play in facilitating bachelor's degree attainment. Foremost, California's higher education policy includes the development of a robust articulation agreement between the state's two baccalaureate granting systems, and the community college system; the University of California system and the California State University system clearly identify which courses community college students need to complete to meet transfer requirements. Moreover, California is home to the largest

community college system in the country and serves over 2 million students. Finally, community college students in California routinely transfer to the UC and CSU.

Using mixed methods including conditional logit regression analysis, Social Network Analysis, and qualitative interviews, I examined: (a) where California community college students transfer to and (b) the institutional forces that shape their college choices. My study uses secondary data from the California Community Colleges Chancellor's Office and original data collected from 114 community college students.

The results reveal disparate transfer patterns for California community college students and reveal distinct factors that motivate their college transfer choice. An analysis of where students transfered to show that stratification exists with high performing African American and Latinx students less likely to attend a selective institution than their Asian and White peers. Social Network Analysis examining the applications of high performing community college students reveal that students are primarily interested in attending the more selective public institutions in the state. Qualitative interviews reveal that students are interested in selective universities located in the state because they are trying to be affiliated with prestigious organizations. At the same time, some students said they were interested in attending private in-state colleges and out-of-state institutions but were unable to access information about how to proceed. Findings suggest that information asymmetry influenced where students elected to transfer to.

ACKNOWLEDGEMENTS:

The process to completing this dissertation has been aided by so many mentors, professors, classmates, groups, friends, family, and random strangers. First and foremost, I thank my primary adviser and chair, Paco Martorell, who has guided me in completing this dissertation. Thank you for the constructive feedback and providing suggestions to help me become a better researcher. I could not have finished the dissertation in a timely manner without your generosity to meet with me every week during the last year of my graduate studies.

I would also like to thank the other members on my committee. Thank you to Michal Kurlaender for your feedback on drafts and thank you for providing me access to administrative data from California Community Colleges Chancellor's Office. Your tireless efforts to build relationships with stakeholders allowed me access to the data needed to answer my research questions. Thank you to Kimberlee Shauman for introducing me to theories from Sociology. I recall walking you to your car in the parking lot and you succinctly gave me a list of seminal works on the Sociology of Education to read; this short walk helped me realized that my theoretical frameworks aligned with theories from Sociology.

I also want to thank Megan Welsh for being a great mentor and helping me throughout graduate school. Megan provided me opportunities to work with her as a graduate research assistant, took me to my first academic conference, and helped me develop an interest in psychometrics. Thank you for also providing me a fellowship through the GAANN fellowship which provided invaluable

opportunities to focus on my studies and execute my research. Thank you for always having my best interest at heart and always being available to support me.

Thank you to all professors who have helped me with my research. Thank you to Mark Wilson from UC Berkeley for sharing your expertise and thank you for your willingness to meet with me in Sacramento to give me feedback. Thank you to Thomas Beamish in the Sociology department for your patience and opening my eyes to see the role that organizations play in influencing the behaviors of individuals. Thank you to Megan Welsh for teaching all the psychometric classes and your dedication to students. Thank you to Kimberlee Shauman for teaching the categorical data analysis class which has given a foundation to conduct my research. Thank you to Cindy Shen for teaching me Social Network Analysis and your generosity in meeting with me during office hours. Finally, I want to thank Noli Brazil for teaching the spatial analysis class; this is the last class that I will ever take and thank you for being a great instructor.

Thank you to my peers and colleagues that I met during graduate school. Thank you to Paul Skomsvold for always being there for me to provide support for me and helping me survive the econometric class. Paul was always there when I needed help with IPEDS data or to answer questions about my data. As I wrote my dissertation, I also cited Paul's research which made me feel like he was by my side. Thank you to Lu Yang for organizing writing sessions and being a resource in graduate school. Thank you to Stacy Wittstock and Mayu Lindblad for helping me get through the graduate course. Thank you to Briana Ballis for spending so much nights with me in the School of Education Building.

Thank you to my group of cohort mates who provided me with community support. Thank you to Alicia Garcia, Sombo Koo, Yvonne Munoz, Jeremy Prim, and Anna Marie Ramos for helping me

get through the program. I enjoyed our time hanging out, relaxing, and getting away from graduate studies. Thank you to Sara Adan and Jill Huynh for being part of the writing group and helping me finish my dissertation during my last year of graduate school. Sara and Jill helped motivate me to write my dissertation and thank you for always providing constructive feedback.

Thank you to my friends who helped me during graduate school. Thank you Nelson Du for always having my back. When I struggled, you were there to provide me with tips and support. Thank you to Dave O'Donnell for providing me advice to complete the dissertation and thank you for always being so supportive. Thank you to Zane Moore for taking me to see the solar system and providing me an opportunity to relax.

Thank you to my family who provided me with so much support. Thank you to my two sisters, Christina and Lily, for providing me moral support and always believing in me. Thank you to my nephew William for always helping me get out of my grad school funk and thank you to the twins Sophia and Tyler for your love and smiles. Thank you to my parents for their sacrifice to provide me with an education. You sacrificed so much by leaving China and starting over in San Francisco. You gave up a stable life to work tirelessly in the United States so that I would have a chance for upward mobility. This dissertation is dedicated to your sacrifices.

Thank you to the administrative staff at the SOE. Mary Reid was amazing in answering all my questions. Thank you to Sherrie Reed for helping run the California Education Lab. Thank you to Betsy Friedmann for helping me gain access to my data.

Thank you to the random strangers who provided me with opportunities to grow as a researcher. Thank you to Wes Edward and I am so lucky to have met you at a conference. I saw Wes at AEFP as he presented on a topic related to my dissertation and I went up to talk to him. We exchanged numbers and he eventually connected me to the folks at UT Austin. Thank you to Huriya Jabbar,

Lauren Schudde, and Pedro Reyes for your help in securing a position at UT Austin. I also want to thank Ozan Jacquette who helped me apply for a postdoc fellowship. While I did not get it, thank you for spending the time to help me and I promise to pay it forward.

I also want to thank the 114 participants in my study. Thank you for helping me with data collection and thank you for sharing your experience. I also want to thank the 31 students who sat down with me to conduct interviews. Your insights are invaluable, and I really appreciate your time. Thank you to the Institutional Researchers at the participating community colleges. Due to confidentiality reasons, I can't reveal who you are but thank you for all your help. I will pay it forward.

Finally, I want to thank Kimberly Yamilet Prado for all the support she has provided me throughout graduate school. I met Yams at a graduate writing retreat and I am so lucky to have her in my life. Thank you for constantly having my back and encouraging me when I am down. I love you so much and I can't wait to tackle all of life's challenges with you.

Chapter 1: College Choice for Community College Transfer students: Transfer patterns and institutional Factors that influence where community college students want to transfer to

Introduction

Students interested in earning a bachelor's degree increasingly begin their postsecondary education at community college (Goldrick-Rab, 2010; Ma & Baum, 2016). When students are ready to transfer to a four-year college, they must decide which institution to attend. This decision carries very important consequences given research showing that college quality affects the likelihood of completing a four-year degree (Cohodes & Goodman, 2014; Melguizo, 2008) and eventually labor market opportunities and earnings (Chetty et al., 2017; Hoekstra, 2009; S. L. Thomas, 2003). While a large literature has examined college choice for high school seniors (Alon & Tienda, 2005; Hossler & Gallagher, 1987; Hoxby & Avery, 2012; B. T. Long, 2004; Rodriguez, 2015; Smith et al., 2013), much less research exists on this decision among community college transfer students.

This study examines transfer patterns for a cohort of students transferring from California's public community colleges. The collective efforts of the 116 community colleges has provided hundreds of thousands of students a starting point to earn a bachelor's degree and reveals the organization capacity of the largest higher education system in the country (California Community College Chancellor's Office) but the results also underscore the structural barrier that exist within the educational pathway to a four-year college. According to the California Community College Chancellor's Office, twenty-nine percent of University of California (UC) graduates and 51 percent of California State University (CSU) degree holders entered higher education by first enrolling at a community college. Moreover, community colleges prepare students for future success with 89 percent of UC transfer students and 73 percent of CSU transfer students earning a bachelor's degree within four years (Johnson & Mejia, 2020). Even as the California's community college system

continues to serve more students, the transfer pipeline that extends to the four-year institutions is straining to meet demand. Capacity constraints have dampened the hopes of transfer eligible students as the more broad access CSU system denied over 12,000 qualified applicants admission to their top CSU campus in 2018 (Cook & Mehlotra, 2020). While the CSU system has a policy of redirecting these academically qualified students to less impacted campuses, the CSU's Office of the Chancellor found that very few students eventually enrolled at any CSU campus (California State University Chancellor's Office, 2019). Moreover, California's community college system continues to face persistent transfer equity gap despite 56 percent of first year students coming from underrepresented groups (Johnson & Mejia, 2020). PPIC found that of the students who transferred to the two state public higher education organization, the CSU and the UC, only 47 and 32 percent came from underrepresented groups, respectively (Johnson & Mejia, 2020). These findings prompt further questions about where students transferring to and what they are looking for in a four-year college.

This study seeks to address questions about students transfer destinations. We first descriptively examine the transfer equity gap across different racial and academic achievement groups. To accomplish this task,we used data from the California Community College Chancellor's Office which includes academic transcripts for the population of all California community college students along with data from the National Student Clearinghouse which identifies the four-year college to which students transferred. Next, we attempted to understand students' college transfer choices by fitting choice models to estimates the relationship attributes of the four-year colleges in our choice set and student enrollment. These choice model offer insights into which institutional characteristics community college students prioritize when they select a four-year college to transfer to. Prospective community college transfer students may act like consumers shopping for a four-year

college and they may demand specific institutional characteristics. These preferences influence where students will ultimately transfer to.

To preview my findings, descriptive results reveal wide variation in college choice patterns across different groups of community college students. Even after controlling for key individual level covariates including measures of academic performance and financial need, I find that Asians are much more likely to enroll at more selective institutions compared to students from other racial groups. In contrast, Latinx students are significantly more likely to attend colleges that are less selective than are observably similar peers from other groups. We also find that students with higher community college GPAs attend more selective transfer institutions, and these results remain even after controlling for student level characteristics.

These findings have important implications for educational equity. Many commentators have suggested that community colleges can "democratize" access to higher education (Dowd, 2003). However, the differences in transfer patterns by race suggest the limits of community colleges to reduce gaps in educational and economic opportunities, even among students with strong community college records who meet the requirements to transfer to selective colleges.

To help understand the extent to which differences in preferences for college attributes are related to these patterns, we estimated discrete choice models and found that student enrollment is associated with several key institutional characteristics. Firstly, students are more likely to enroll in institutions with higher student SAT scores, suggesting a preference for more selective colleges. Moreover, we find that African American, Asian, and Latinx students are more likely to enroll at campuses with a greater share of peers that match their racial identity; this pattern is especially strong for Asian students. In addition, we find that students are less likely to choose institutions with

higher tuition, but enrollment is positively associated with colleges that offer more grant aid. These results may imply that students are sensitive to the price of higher education.

The structure of the papers is as follows: Section II includes the literature review; Section III provides the research questions; Section IV describes the data and methodology; and Section V presents the results. Section VI consists of the conclusion and policy implications from my findings.

Section II: Literature Review

This paper attempts to understand the college choice decisions for community college students because there has been only limited research on this topic. While an estimated 80 percent of community college students state some interest in earning a bachelor's degree (NCES, 2011), there is limited knowledge of where community college students elect to transfer to and factors that influence their decisions. Some research has found that students who first attended a community college and then transferred to a four year college were found to more likely attend more selective institutions than individuals with similar high school academic achievement and socioeconomic characteristics (Hilmer, 1997; Ortagus & Hu, 2019). At the same time, there appears to be some higher education stratification as few community college students actually transfer to selective institutions (Wang, 2016), with the majority enrolling at public selective institutions over private colleges (Cheslock, 2005) and those that do attend selective colleges, they are primarily from middle upper class household (Dowd et al., 2008).

While Dowd (2008) has found that higher income community college students are more likely to transfer to selective institutions, to the best of my knowledge, there has been limited research transfer destinations for students from different racial backgrounds. By contrast, there has been extensive work examining high school seniors from racial backgrounds and the extend that they

enroll at selective institution. Much of this work focuses on college undermatching, or the phenomenon where high performing, high school students attend less selective institutions even though they had the academic achievement to attend more selective colleges (Bastedo & Flaster, 2014; Black et al., 2015; Deutschlander, 2017, 2017; Ovink et al., 2018; Rodriguez, 2015; Smith et al., 2013). Undermatching can lead to deleterious student outcomes such as extended time to earn a bachelor's degree (Bowen et al., 2009) or lower likelihood of earning a bachelor's degree (Alon & Tienda, 2005). Black et al. (2015) found African American and Latinx high school students in Texas were more likely to undermatch than their Asian and White counterparts. Meanwhile, Smith et al. (2013) examined a sample of students across the United States and found more mixed results with Latinx students more likely to undermatch while African American, Asians, and White students less likely to undermatch. To the extent that high performing community college students undermatch is an open question and deserves more examination.

Community college students who undermatch may prioritize institution characteristics other than academics but there is also a lack of understanding of the types of four-year colleges that they are interested in transferring to. The limited research on college choice for community college students primarily focuses on the relationship between individual level characteristics such as income and transfer to a selective four-year college. However, baccalaureate granting institutions may have other unique characteristics that drive enrollment demands. Community college students can be likened to consumers in a higher education marketplace who are seeking institutions with particular characteristics that suits their needs and fits within their budget. Examining the relationship between institutional characteristic and college choice may explain where community college students eventually transfer to and reveal factors that lead to stratification within the higher education sector. Much can be learned from the college choice literature for high school seniors

which have identified factors that influence college choice. Our non-exhaustive overview of college choice for high school seniors identifies some institutional characteristics such as geography, institutional quality, college cost, consumption amenities, and campus racial diversity are associated with enrollment decisions.

Geography

Research on college choice have examined the relationship between geography and high school students' college choices. Some scholars have examined the applications submitted from students in unique states to characterize their college choice sets and the results have revealed a greater preference for in-state institutions. Another approach researching the role of distance and college choice behavior examined where high school students send their standardized college admission test scores to (Niu, 2015; M. K. Thomas, 2004; Toutkoushian, 2001). Thomas (2004) and Toutkoushian (2001) examined Texas and New Hampshire students, respectively and found that students primarily applied to in-state colleges and institutions in neighboring states. Students from different racial groups may also be more sensitive to distance as Asians (Niu, 2015) and Latinx (Desmond & López Turley, 2009) were more likely than their White counterparts to apply to schools closer to their place of residence. This can have unintended consequences if students live in education deserts or areas with limited access to postsecondary institutions (Hillman, 2016). Hillman (2016) found that communities with larger White and Asian students had more options than communities with larger Latinx population and areas with lower educational attainment. In effect, location bound students may have a more reduced set of colleges to choose from.

College Quality

A growing body of literature have examined the relationship between the quality of postsecondary institution that students attend and educational outcome. College quality has been operationalized by identifying institutions selectivity (Smith et al., 2013), SAT scores of incoming freshmen (Hoxby & Avery, 2012), student faculty ratio (B. T. Long, 2004), and institutional spending for student services (Skinner, 2019). Attendance at a higher quality postsecondary institution has been associated with greater likelihood of graduating with a bachelor's degree (S. R. Cohodes & Goodman, 2014), enrollment in graduate school (Brewer et al., 1996), and larger lifetime earnings (Dale & Krueger, 2011).

College Costs

While there appears to be benefits to attending a higher quality college, the cost of attendance has also been shown to influence where students elect to enroll at. Kim (2004) examined students college choice sets and found White and Asian students would more likely choose their top ranked option if they were offered financial aid such as grants and loans while Latinx and African American students' college choices showed no relationship with offers of financial aid. Students' college choices may also be influenced by their differing perceptions towards taking out student loans (Perna, 2008) with many students more averse to borrowing to finance their education (Boatman & Evans, 2017). While the cost of pursuing postsecondary education may influence college choice, it has been shown that students may not have access to pertinent information and overestimate the true out-of-pocket cost (Grodsky & Jones, 2007).

Consumption Amenities

College consumption amenities may also influence students' choices for enrollment. Pope and Pope (2009) found that universities received more applications from prospective students when they had greater collegiate sports success. Likewise, there has been some indications that additional spending on sports, college activities, and dormitories increase students' interest in attending a particular institution (Jacob et al., 2013). Not surprising, colleges have been known to produce glossy brochures known as viewbooks to entice prospective students (Hartley & Morphew, 2008) or extensively market the campus aesthetics, student life, and collegiate sports to prospective students on their campus websites (Saichaie & Morphew, 2014)

Campus diversity

With a more diverse population of students enrolling in college (Hussar et al., 2020), institutions' demographic makeup may influence school choice. Some students are more likely to attend institution that matches their own racial identity (Black et al., 2020). It has also been shown that minority serving institutions such as primarily or exclusively Historically Black Colleges and Universities (HBCUs) disproportionally produce more African American STEM graduates which may be attractive to students when they select a college. Moreover, African American students may elect to attend an HBCUs since many have higher graduation rates than the federal graduation rates (Espinosa et al., 2017). Likewise Esponisa et al. (2017) found that Latinx students and Asian American students who attended public four-year Hispanic Serving Institutions and Asian American and Native American Pacific Islander-Serving Institutions, respectively, experienced higher graduation rates than the national average. Besides academic factors, Latinx students also said attending an HSI was attractive because the designation meant greater campus funding and more validation of the pressing issues faced in their communities (Garcia & Dwyer, 2018).

Section III: Research Questions

Our literature review motivates a closer examination to determine if there are transfer equity gaps for community college students, especially across different racial groups. In the event that we find descriptive evidence that different racial groups are disproportionally represented at selective institution, this would be a catalyst to identify institutional factors that may be associated the equity gaps. To understand the college choices for California community college students, I pose the following research questions:

1. What are the transfer patterns for community college students?
2. How does the transfer patterns vary with respect to different student subgroups?
3. Where are relatively high performing community college students transferring to?
4. What institutional characteristics of four-year colleges predict the transfer destination of community college students?
5. What institutional characteristics of four-year colleges predict the transfer destination of community college students with different individual level characteristics such as race and socioeconomic status?

Section IV: Description of the data and analytical method

Description of the data

We utilized data from California Community College (CCC) Chancellor's Office which tracks the population of all students enrolled at the 114 campuses across the state. This data includes information on students' academic outcome such as credits attempted, credits earned and GPA, as well descriptors for initial academic goals prior to enrollment as well initial date of enrollment. We

also have student level demographic and socioeconomic indicators such as race, gender, uptake of a Pell Grant or Board of Governor's fee waiver. We followed a cohort of first-time college going students who first enrolled during the 2012-13 academic year and tracked them for six years to see if they had transferred. We limited the sample to students who took at least 12 transferrable units across all CCC campuses over these six years and subsequently transferred. We subsequently dropped students with less than a 2.00 GPA because these students would not have qualified to transfer to a CSU campus which is the most frequent transfer destination for students in the state. In total, our analytical sample consisted of 43,590 students who transferred after six years.

We merged this dataset with publicly available IPEDS data which offers institutional level characteristics of each four-year colleges in the sample. We were primarily focused on the type of four-year colleges that students considered transferred to and we excluded individuals enrolled at community colleges that offered bachelor's degree. We also dropped students who transferred to specialty institutions such as seminary schools, medical schools, law schools, and business schools. In addition, since we were interested in the role that distance may be associated with college choice, we dropped online-only institutions which IPEDS has an indicator for.

Measures

Outcome Variable

Question 1, 2, and 3 sought to uncover transfer patterns for students from different subgroups and we initially reported where the proportion of students transferred to by destination. First, we grouped institutions into four categories based on college sector: University of California (public research universities), California State University (public universities with an undergraduate teaching focus), in-state-private, or out-of-state institution.

Although college sector is related to selectivity and academic prestige, we also grouped colleges explicitly based on selectivity using median SAT scores of enrolled students. Specifically, we assigned the SAT score to the campus the year prior to a student's enrollment; for example, a student who enrolled at an institution in the Fall of 2013 would have used the test scores for the 2011-12 academic year. Next, we combined each college's math and verbal scores as reported at the 25th and 75th percentile and then estimate the average. If a campus only reported an ACT score, we converted to SAT equivalent scores. 1.50 percent of institutions did not have either an SAT or ACT score so we conducted a hot deck imputation and missing values were selected from donors who shared similar institutional characteristics (Andridge & Little, 2010). For my analysis, we retrieved Carnegie classification and institutional size from IPEDS to impute scores using comparable institutions. Then we followed Long (2004) and converted the average SAT scores to percentiles based on the student SAT score distribution. 1

After estimating each campus' yearly average median study body SAT score, we created four groups called "Very Selective", "Selective", "Somewhat Selective", and "Non-selective" and assigned campuses based on the admission standards for the UC campuses. We leveraged a state policy called the Transfer Agreement Guarantee (TAG), a program that provides guaranteed enrollment to some of the UC campus (UCOP), to assign institutional selectivity. We labelled UC Berkeley, UCLA, and UC San Diego as "Very Selective" colleges because they do not participate in the TAG agreement and they are considered the elite UCs institutions within the state's higher education system (Kurlaender & Grodsky, 2013). Next, we classified UC Davis, UC Irvine, and UC Santa Barbara together to form a "Selective" Group because institutions participate in the state's TAG program which offers guaranteed transfer admissions to students on the condition of meeting a certain GPA cut score; UC Davis, UC Irvine, and UC Santa Barbara share similar GPA admission

requirements (UCOP). Then UC Santa Cruz, UC Riverside, and UC Merced were clustered into a group called "Somewhat Selective" because they also participate in the TAG agreement and their GPA admission requirements are also very similar with each other (UCOP). Subsequently, we identified the lowest average median SAT score within each of our three groups over a six-year period; these SAT scores would serve as the lower bound for each of the three groups. Then we assigned campuses from the CSU system, in-state private colleges, and out-of-state colleges to each group based on their lowest SAT score over the same six-year period. Schools with SAT scores that fell below the "Somewhat Selective" group were subsequently assigned to fourth group called "Nonselective. Below is a table of the categories for all the UCs and the CSUs (Table 1).

Table 1: Institutional Selectivity as a function of SAT score

Selectivity	**Sample Institutions**	**Median SAT Score Range**	**SAT Percentile Range**
Very selective	UC Berkeley, UCLA, UC San Diego	1240-1360	85-95
Selective	CSU-Poly SLO, UC Santa Barbara, UC Davis, UC Irvine	1130-1220	71-83
Somewhat Selective	UC Santa Cruz, CSU San Diego, UC Riverside, CSU Maritime, CSU-Poly Pomona, CSU Long Beach, CSU San Jose, CSU Fullerton, CSU Chico, CSU SF State, CSU Humboldt, UC Merced	970 -1100	42-67
Non-selective	CSU Monterey, CSU Channel Islands, CSU San Marcos, CSU Sacramento, CSU Stanislaus, CSU East Bay, CSU Bakersfield, CSU Northridge, CSU Fresno, CSU LA, CSU San Bernardino, CSU Dominguez Hill	840 - 960	20 - 40

Question 4 and 5 sought to examine the relationship between transfer destination and institutional characteristics of the four-year colleges in the choice set. The outcome of interest is the

four-year college that a student transferred to which we accessed from National Student Clearinghouse through data from California Community College Chancellor's Office.

Independent Variables

Our student level independent variables were derived from California Community College Chancellor's Office. Table 2 presents a list of covariates and a brief explanation of we operationalized them. Our individual level indicators consist of students' demographic and academic achievements. Students were classified as either African American, Asian American, Latinx, White, or Other. We included a student's gender, age of entry and whether they received either a Pell Grant or a state tuition fee waiver called the Board of Governor's Fee Waiver (BOG Waiver). Qualified receipents of a BOG waiver do not have to pay the per-unit enrollment fee for the entire academic year. Academic indicators consisted of cumulative units earned and final GPA earned across all the campuses they attended. Students' final GPA were binned it in 0.10 increments in the statistical models to allow for a flexible relationship between college choice and academic record.

Our institutional level independent variables were derived from six years of IPEDS data. Our institutional level indicators broadly consider the relationship between college choice and geography, college quality, college amenities, cost, and racial diversity of the campuses. For geography, we estimated distance between a student's community college and each of the four-year colleges in the choice sets and we also included the urbanicity of the campus location; these estimates also allow us to find the nearest CSU and UC for each student. For college quality, we have indicators for average median SAT score, student-faculty ratio, as well as research, and instruction expenditure per full time equivalent student, respectively. College amenities was separately measured by average student service and auxiliary expenditure per FTE. Auxiliary expenditure can include expenses for residence halls, food services, student health services,

intercollegiate athletics, college unions, college stores, faculty and staff parking, and faculty housing. For college cost, we identified the average amount of grants, loans and tuition for each four-year college. Finally, we took the average percentage of African American, Asian American, Latinx, and White students at each institution.

Table 2: Measures

	Independent Variable	Description
Student level characteristics		
	Demographic background	
	African American	Dummy variable (coded 1 for African Americans)
	Asian American	Dummy variable (coded 1 for Asian)
	Latinx	Dummy variable (coded 1 for Latinx)
	White	Dummy variable (coded 1 for White)
	Other	Dummy variable (coded 1 for 2+ Race, and other races)
	Female	Dummy variable (coded 1 for females and 0 male)
	Age at Entry	Continuous Variable
	Received Fin. Aid	Dummy variable (coded 1 for students who received either a Pell Grant or a Board of Governor's Fee Waiver)
	Academic background	
	Community college GPA	Categorical variable from 2.00 to 4.00 in 0.10 increments
	Cumulative units	Continuous variable with a minimum of 12 units.
Institutional Characteristics		
	Geography	
	Distance	Continuous variable in miles between a unique four-year college and a unique California community college
	Urban	Dummy variable (coded 1 if school is located in Urban area)
	Suburban	Dummy variable (coded 1 if school is located in suburban area)
	Rural	Dummy variable (coded 1 if school is located in rural area)
	College Quality	
	SAT scores	Continuous variable by percentile scores
	Research Expenditure/FTE	Continuous variable by $1000 dollar in Research Expenditure per FTE
	Instruction/FTE	Continuous variable by $1000 dollar in Instruction per FTE
	Student/faculty ratio	Continuous variable by student faculty ratio
	College Amenities	

	Student Service Expenditure/FTE	Continuous variable by $1000 dollar in student service expenditure per FTE
	Auxiliary Expenditure/FTE	Continuous variable by $1000 dollar in Auxiliary Expenditure per FTE
	College Finance	
	Grant	Continuous variable by percent of students who took out grants
	Loans	Continuous variable by percent of students who took out loans
	Tuition	Continuous variable by percent of students who took out tuition
	College Diversity	
	% African American	Continuous variable by percent of students who are African American
	% Asian	Continuous variable by percent of students who are Asian
	% Latinx	Continuous variable by percent of students who are Latinx
	% White	Continuous variable by percent of students who are White

Methods

We took several approaches to answer the first two research questions. We report descriptive statistics of the sample of students and state the institutional characteristics of the four-year colleges that students enrolled to reveals students transfer patterns. We characterized transfer destinations using institution sector, which consisted of a UC campus, a CSU campus, an in-state private college, or an out-of-state college. Secondly, we used the average median SATs as a proxy for the selectivity of the campus, and classify a transfer institution by four possible classifications, "Very Selective," "Selective," Somewhat Selective," and "Non-Selective" and we describe the development in the Measures section of this paper. Using these classifications of transfer institutions, we examined whether there are differences in transfer patterns by the five racial groups (African American, Asian, Latinx, White, Other) that we created.

We posed research question three because we are motivated to see whether differences in the transfer patterns for different groups of community college students remain after accounting for differences in student characteristics across groups. For question three, we estimate multinomial

logistic regression (MLR) models to evaluate the relationship between transfer destination and our two primary variables of interest:1) students' race and 2) community college GPA holding constant other determinants of transfer destination that vary across these groups. The left-hand side of Equation 1 is transfer destination for student *i*. In our MLR model $Race_i$ represents unique dummy variable for student *i* who identified as either African American, Asian American, Latinx, or White [omitted comparison group], or Other. GPA_i is an indicator for different GPA bins that represents the academic performance of student *i*. $Gender_i$ is the gender of student *i* and is treated as a binary variable. To account for socioeconomic status, Fin_Aid_i takes into consideration the financial situation of student *i* and is a dummy variable for financial aid uptake with a *1* representing if student *i* received either a Pell Grant or Board of Governor's Fee Waiver and *0* otherwise.

$$transfer\_destination_i = B_0 + B_1 Race_i + B_2 GPA_i + B_3 Gender_i + B_4 Fin\_Aid_i + B_5 Distance\_CSU_i + B_6 Distance\_UC_i + \pi_{is} + \varepsilon_i \quad \text{(Eq. 1)}$$

We also added institutional characteristics to the MLR model. π_{is} is a campus level fixed effects for student *i* attending community college *s* to control for time-invariant unobserved institutional characteristics that can be associated with the observed covariates.[1] Finally, ε_i represents the error term for student *i.*

To examine how the probability of a particular transfer outcome varies by race holding constant the other variables in the model, we computed fitted probabilities for each value of $Race_i$ for fixed values of the other covariates. Specifically, we calculate the predicted probability that *y* for

[1] Note, during the period of interest, there were 114 unique community colleges in the state, but Compton Community College was experiencing accreditation issues and was in a partnership with El Camino College. Thus, the dataset grouped Compton Community College with El Camino College.

student *i* is equal to outcome *m* for a student with a particular value of $Race_i$ using the following formula:

$$\widehat{Pr}(y_i = m \,|Race_i, GPA_i, \overline{X_i}) = \hat{B}_0 + \hat{B}_1 Race_i + \hat{B}_2 GPA_i + \hat{B}_3 \,\overline{X} \qquad \text{(Equation 2)}$$

We decided to fix student GPA at a relatively high level to illustrate the college choices for a hypothetically high performing student. Since very few students with low community college GPA transfer to a selective college or to a UC, the probabilities are evaluated at a value of 3.3, which is the value of the approximate requirement for guaranteed entry to some of the more selective UCs under the state's Transfer Admission Guarantee.[2] $\overline{X}$ represents all the other variables and they are set at the overall sample mean to calculate the predicted probabilities.

To answer research question four and five, we sought to understand students' demands for unique institutional characteristics. Thus, we utilized McFadden's conditional choice models to understand the relationship between students' college choices and the institutional characteristics of the transfer destinations. Conditional choice models are ideal when an individual face a discrete choice set, and they can only choose one of the options. In McFadden's (2009) seminal work, he utilized the conditional choice model to estimate individuals' preferences for different modes of transportation such as choosing between commuting on a bus compared to driving a car. Individuals' make choices because they derive some form of utility from utilizing a unique mode of transportation such as the time spent commuting, and there is also a corresponding cost associated with the choices such as the price of each traveling option. In this research, we used this framework to estimate "demand" for institutional characteristics.

[2]Of the 9 UC campuses that serve undergraduate students, UC Davis, UC Irvine, UC Merced, UC Riverside, UC Santa Barbara, and UC Santa Cruz participate in the TAG program. UC Irvine has a 3.40 minimum GPA requirement for students to participate in the TAG agreement while UC Davis and UC Santa Barbara have a 3.30 minimum GPA requirement. UC Berkeley, UCLA, and UC San Diego do not participate in the TAG agreement

The data arrangement for the conditional logit model differs with MLR models. In the conditional logit model, the dataset consists of individual-institution combinations (Long & Freese, 2005). As a result, the number of observations is equal to the product of the number of possible transfer destinations (denoted by *J*) and the number of students (*N*).

Following Long (2004) and Black et. al (2020), we estimate college choice with a conditional logit model. As shown in Equation 3, we model the probability that individual *i* selects school *j,* with i =1, 2, … N and j= 1,2, …M, where N is equal to the sample of students which is 43,590 and M is equal to the colleges in the choice set which is 920. In Equation 3, the probability that individual *i* selects school *j* is a function made up of alternative specific variable or institutional level covariates represented by Z_{ij}. For ease of interpretation, we exponentiated Equation 3 and produced Equation 4 and for each explanatory variable, there is associated β coefficient. The probability that student *i* selects school *j* is a function of $Geography_{ij}$ which is a vector of indicator variables representing spatial characteristics at institution *j*, $Institutional\_Quality_{ij}$ which represent a vector of indicator variables describing academic attribute of institution *j*, $Consumption\_Amenities_{ij}$ which indicates a vector of variables for nonacademic school expenditures at institution *j*, $Finance_{ij}$ which denotes a vector representing the costs of attendance at institution *j*, and $Race\_Identity_{ij}$ which specifies a vector of racial demographics based on the prior year enrollment at an institution.

$$\Pr(Y_i = j) = \frac{e^{Z_{ij}*\beta}}{e^{Z_{i1}*\beta} + e^{Z_{i2}*\beta} + e^{Z_{i3}*\beta} + \cdots + e^{Z_{ij}*\beta}} \quad \text{(Eq. 3)}$$

$$Z_{ij} * \beta = B_1 * Geography_{j1} + B_2 Institutional\_Quality_{ij} + B_3 Consumption\_Amenities_{ij} + B_4 Finance_{ij} + B_5 Race\_Composition_{ij} + \epsilon_{ij} \quad \text{(Eq. 4)}$$

Section V: Results

Descriptive Statistics

Table 3 consists of descriptive statistics of the students who transferred. Students were approximately 18 years old when they first enrolled at their respective community college, and they had an average GPA of a 3.00. Almost 27% of students received either financial aid such as a Pell Grant, or a Board of Governor's Fee Waiver. The two largest racial groups were Latinx (37%) and White student (34%) while Asian Americans and African American represented 15% and 4% of the sample, respectively. Women were more likely than men to transfer and approximately 57 percent of students who transferred stated prior to enrollment this was their goal.

Table 3: Student Level Descriptive Statistics

Variables	Values	Mean	Std. Dev.
Academic	GPA	3.141	.512
	Cumulative Units	76.332	29.465
	Age at Entry	18.852	3.999
Finance	Received Fin. Aid	.263	.44
Race	Asian American	.147	.354
	African American	.038	.19
	Filipino	.035	.183
	Latinx	.367	.482
	Native American	.002	.048
	Asian Pacific Islander	.003	.058
	2+ Race	.046	.209
	White	.336	.472
	Other	.026	.16
Table 2-Continue			
Sex	Female	.547	.498
	Male	.445	.497
Type of institution	Cal State U	.59	.492
	In-State Private	.091	.287
	Out-of-State	.119	.324
	U of Cal	.2	.4

Initial Academic Goals	Transfer AA	.415	.493
	Transfer	.154	.361
	AA	.018	.133
	Vocational Certificate	.003	.054
	Career	.029	.169
	Undecided	.104	.305
	Other Goals	.105	.306
	Unknown	.168	.374

We also wanted to draw attention to the time it took students to transfer. While community colleges are often referred to as two-year colleges, this terminology misrepresents the actual time that most students need to complete their lower division requirements. In Figure 1A and 1B, we explored the relationship between time of transfer and college transfer choice. Of the six years that I followed this sample, the most students who transferred to a CSU took classes at a community college for five years. Meanwhile, the greatest percentage of students who transferred to a UC or an out-of-state college after their fourth year in a community college. Most students who transferred to private college in California spent three years at a community college. The disparities in time to completion at a community college and transfer destination may be an indication of students' purpose. Students who eventually transferred to a CSU may have needed more time at a community college to identify their academic or career goals. Meanwhile students who subsequently enrolled at a private in-state college may have defined their motivations to transfer much earlier.

Figure 1A

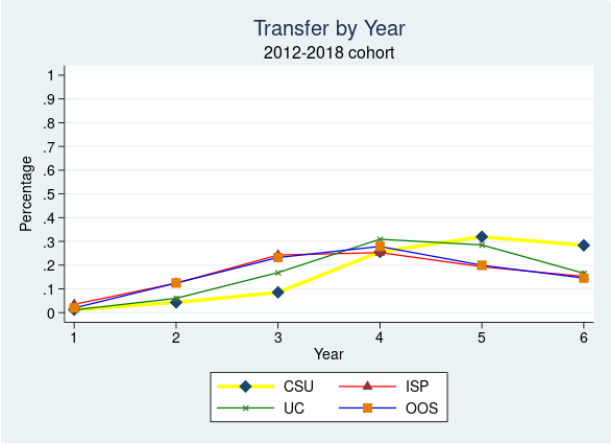
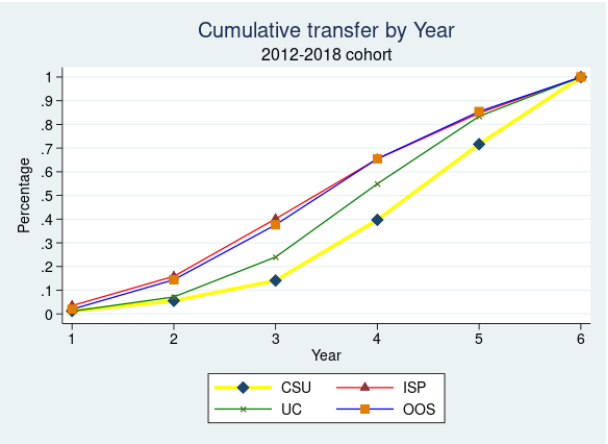


Figure 1B



We proceeded to examine campus characteristics of the institutions in the choice set and added institutional weights to provide some context (Table 4, Panel 1). There was a total of 920 unique institutions and the academic profile for admitted students at varied. To understand the role that geography may influence students, we also estimated the distance between each of the 920 unique colleges and the 114 community colleges in California and the average distance was about 364 miles. The average SAT score for admitted students was about a 1055. Students may also look at cost and aid packages when they consider transferring to a four-year college. We also retrieved average instructional, research, and student service per full-time student for each college in the choice set. Since the choice set includes land grant institutions, broad access institutions, and private liberal arts colleges, there were wide variations in campus resources for students. We found that the average grant package was larger than the average tuition while the average loan taken out by a student was about $5,749 dollars.

Table 4: Descriptive Statistics

	Panel 1: (Institutional weighted: 920 unique four-year colleges)		**Panel 2: (Student weighted: 43,590 unique students)**	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Geography				

Distance (mile)	2633.07	1257.77	364.31	818.18
Urban	.74	.44	.74	.44
Suburban	.21	.41	.25	.43
Rural	.049	.22	.009	.094
Institutional Quality				
Median SAT	1058.96	141.19	1055.7	137.06
Research Expenditure/FTE	2527.31	8145.41	3965.42	7745.43
Instruction/FTE	11076.04	9808.78	11338.09	8456.22
Student/faculty ratio	15.07	4.48	21.73	5.14
Consumer Amenities				
Student Service Expenditure/FTE	3224.28	2149.449	2737.95	1207.04
Auxiliary Expenditure/FTE	37,586,221	73023988	74,606,963	1.139e+08
Financial Factors				
Grant	13,946.37	8496.43	12191.18	5550.99
Loans	6984.93	1600.78	5740.55	1087.23
Tuition	23234.72	10772.52	11211.61	9926.02
Racial Makeup				
% Asian	.05	.06	.17	.10
% African American	.12	.19	.046	.06
% Latinx	.10	.12	.29	.14
% White	.57	.23	.32	.16

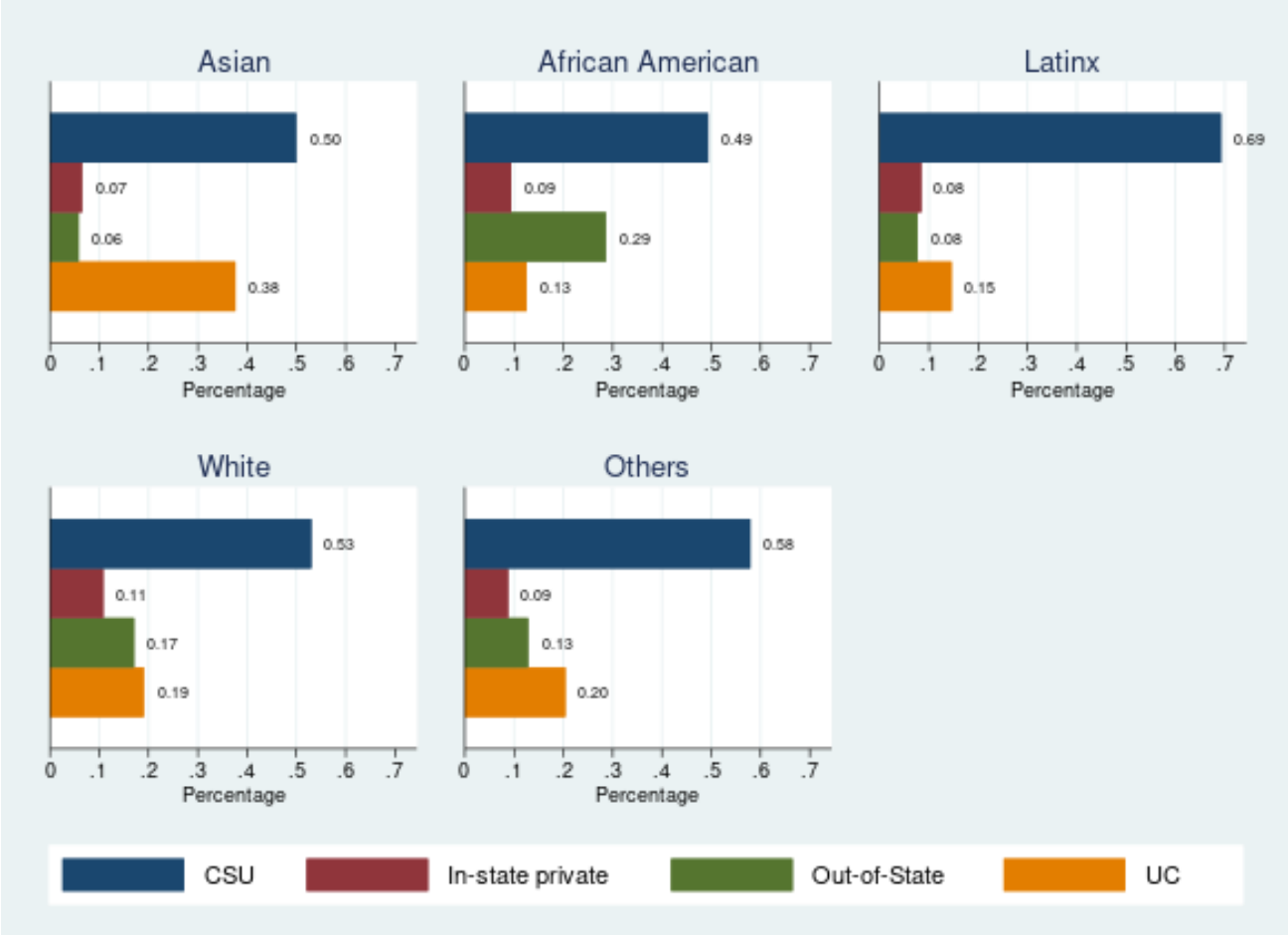
We also provided student weighted descriptive statistics to contextualize where students primarily transferred to (Table 4, Panel 2). We kept our entire sample of 43,90 students and estimated the average for the same institutional characteristics. As a result, we find that the average distance is reduced significantly. We also see differences in type of schools that students with students more likely to be enrolled at institutions with larger Asian American and Latinx students.

Transfer Patterns across different institutional sectors

We begin the analysis of students' transfer patterns by descriptively reporting how transfer choices vary by racial group. Figure 2 shows results the four largest racial groups (the remaining students are in the "Other" group). Overall, the largest proportion of students were attending the CSU system. However, we find that Asian students transfer to the UC system at much higher rates than the other racial groups; in fact, the proportion of Asians that transfer to the UC system is greater

than twice the fraction of African American or Latinx students. African American students proportionally are more likely to attend an out-state college and least likely to enroll in the UC system. Latinx students proportionally have the highest rates of CSU attendance and have low rates of attending an out-of-state college or a UC campus.

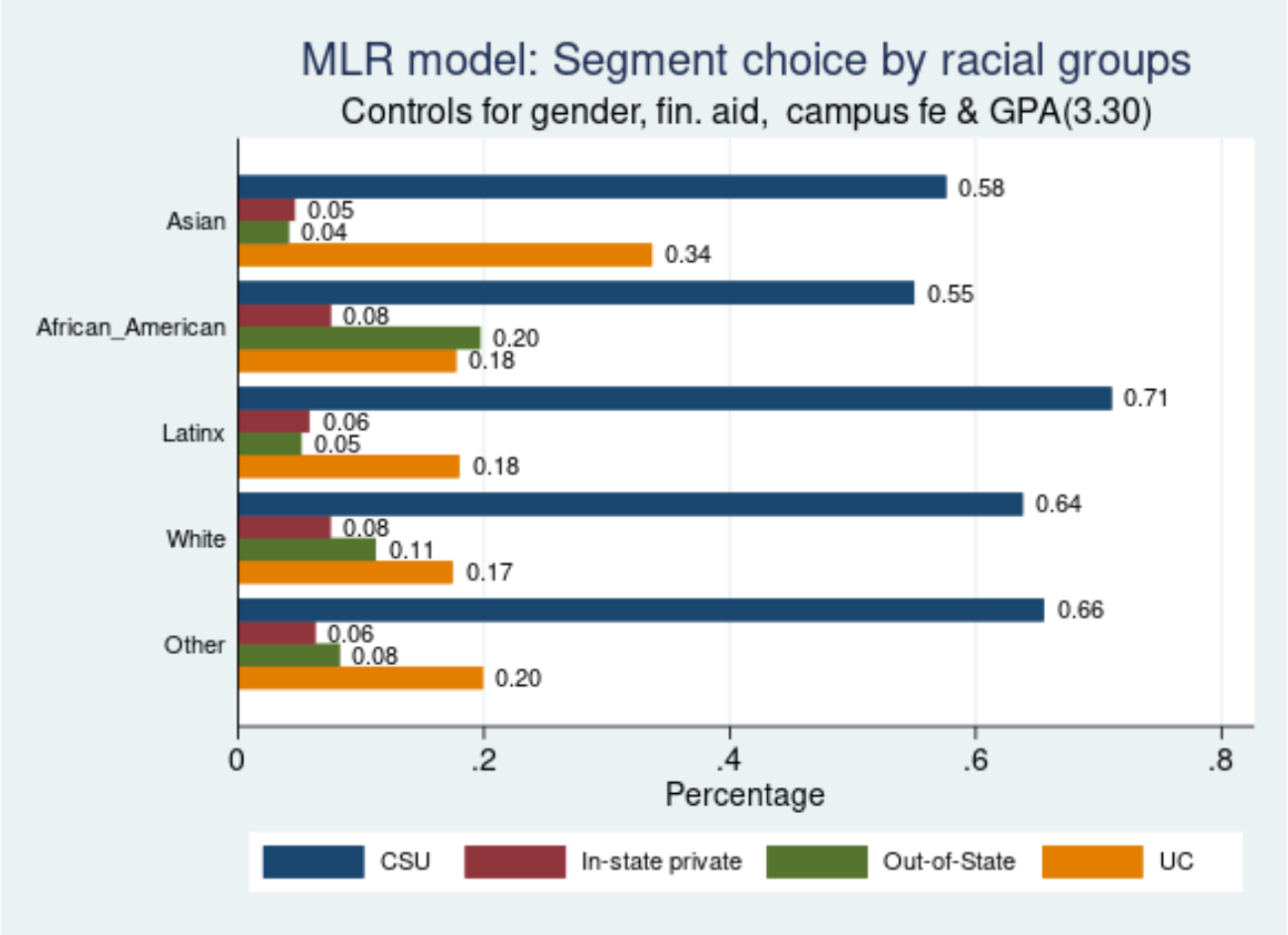
Figure 2



How much of the gaps in transfer patterns by race is associated with differences in other observable student and campus level characteristics? To answer this question, we adjusted these gaps by using the MLR models as described above and controlling for student level characteristics and included dummy variable for gender, whether a student received financial aid, and whether a student

earned at least a 3.30 GPA. In addition, we controlled for time invariant institutional level characteristics by including campus level fixed effects After controlling for student level and campus level characteristics, we see a reduction in the transfer equity gap for African American and Latinx students, resulting in a greater likelihood that African American and Latinx students attend a UC and an in-state private college, respectively while simultaneously a lower probability of attending an out-of-state college relative to attending a CSU (Figure 3).

Figure 3



We examined high performing students which we defined as someone with at least a 3.30 GPA. We find that the transfer gap is reduced as the probability of African Americans and Latinx students with a 3.30 GPA enrolled at the UCs relative to the CSUs at comparable rates as their White

peers. This suggests much of the transfer gap between African American, Latinx and White students is associated with student and institutional level characteristics. At the same time, there is a noticeable transfer gap between Asian Americans and the rest of the students in the sample. Our findings may be limited by omitted variable bias due dataset constraints and there appears to be other factors that may be associated with this transfer gap.

Transfer Patterns across different college selectivity

We subsequently examined the relationship between student transfer patterns and campuses with different degrees of selectivity. In Figure 4, we find some similar descriptive patterns with Asian and White students more likely to attend more selective institutions than their African American and Latinx counterparts. As a proportion, over 40 percent of all Asian Americans and slightly less than 30 percent of all White students transferred to a "Very Selective" or "Selective" institutions, respectively. Meanwhile less than 20 percent of all African American and Latinx students transferred to a "Very Selective" or "Selective" institutions, respectively.

Figure 4

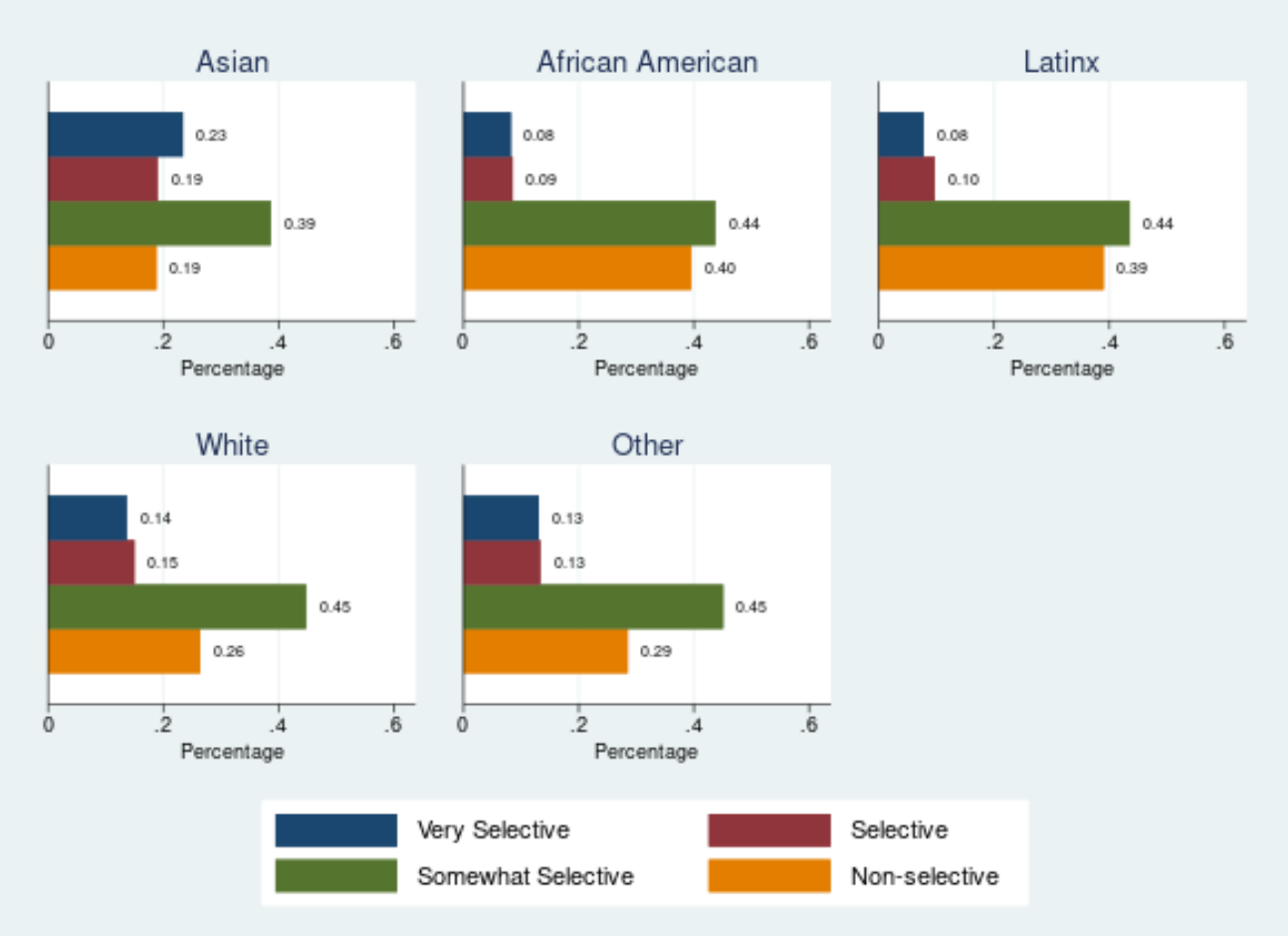
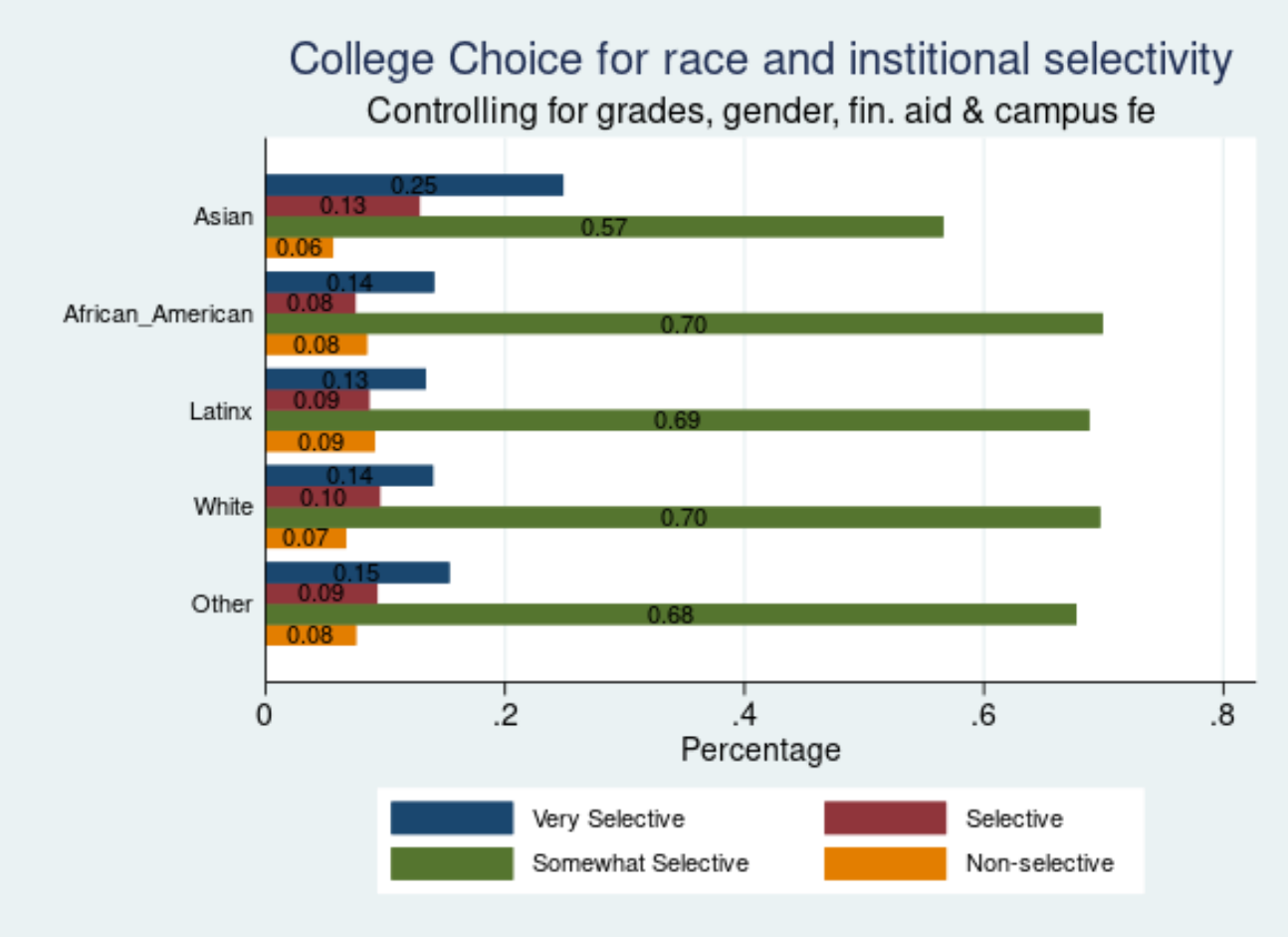


Figure 5 shows regression-adjusted results, and shows changes in transfer destinations. When we examined students and controlled for GPA, gender, financial aid uptake and time invariant campus level characteristics, we see a lower likelihood of attending the "Very Selective" institutions across each racial group and greater likelihood of attending a "Somewhat Selective" schools. We also notice that the likelihood of attending a "Very Selective" school for White student mirrors African American and Latinx students after controlling for these student and campus level characteristics. However, after we included these controls, we find Asian Americans are still more likely to attend a "Very Selective" or "Selective" institution, and African American and Latinx

students are still most likely to attend non-selective colleges. This transfer gap raises additional question which we will attempt to partially explain in the next section where we report our results for the conditional logit models.

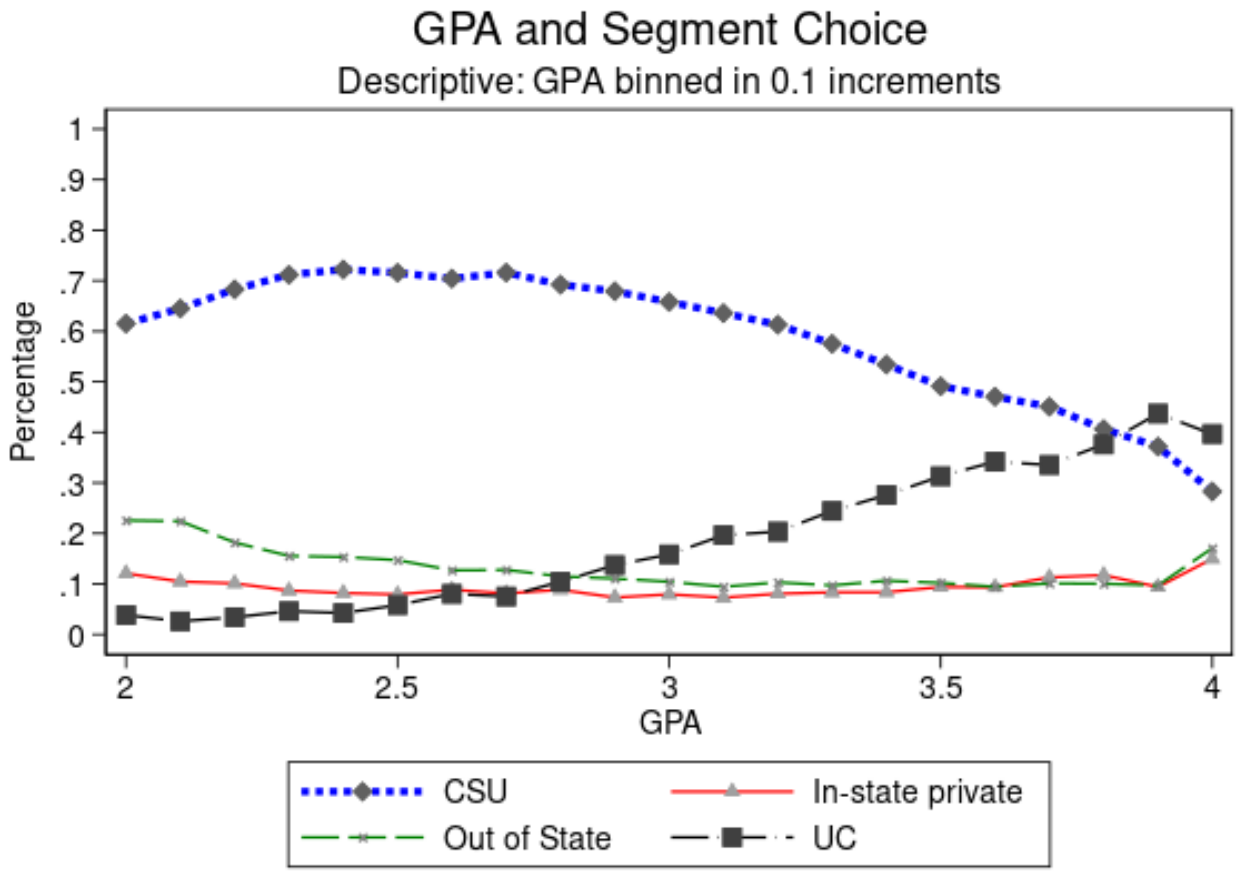
Figure 5



Next, we examined the relationship between student destinations and academic performance. We binned student GPAs into 0.10 bins so that we could identify the proportion of students within these intervals who either selected a CSU, UC, in-state private, or out-of-state college. Figure 6 provides a visual illustration of where students in different GPA bins enrolled at. We find that the students with lower GPAs primarily enroll at a CSU campus. However, the proportion of students

who enroll at a CSU decrease as GPA increases while the share of students enrolled at the UC also increase. When we examined enrollment at in-state and out-of-state institutions, the proportions are flat across GPAs, except an increase in interest for students with high GPAs.

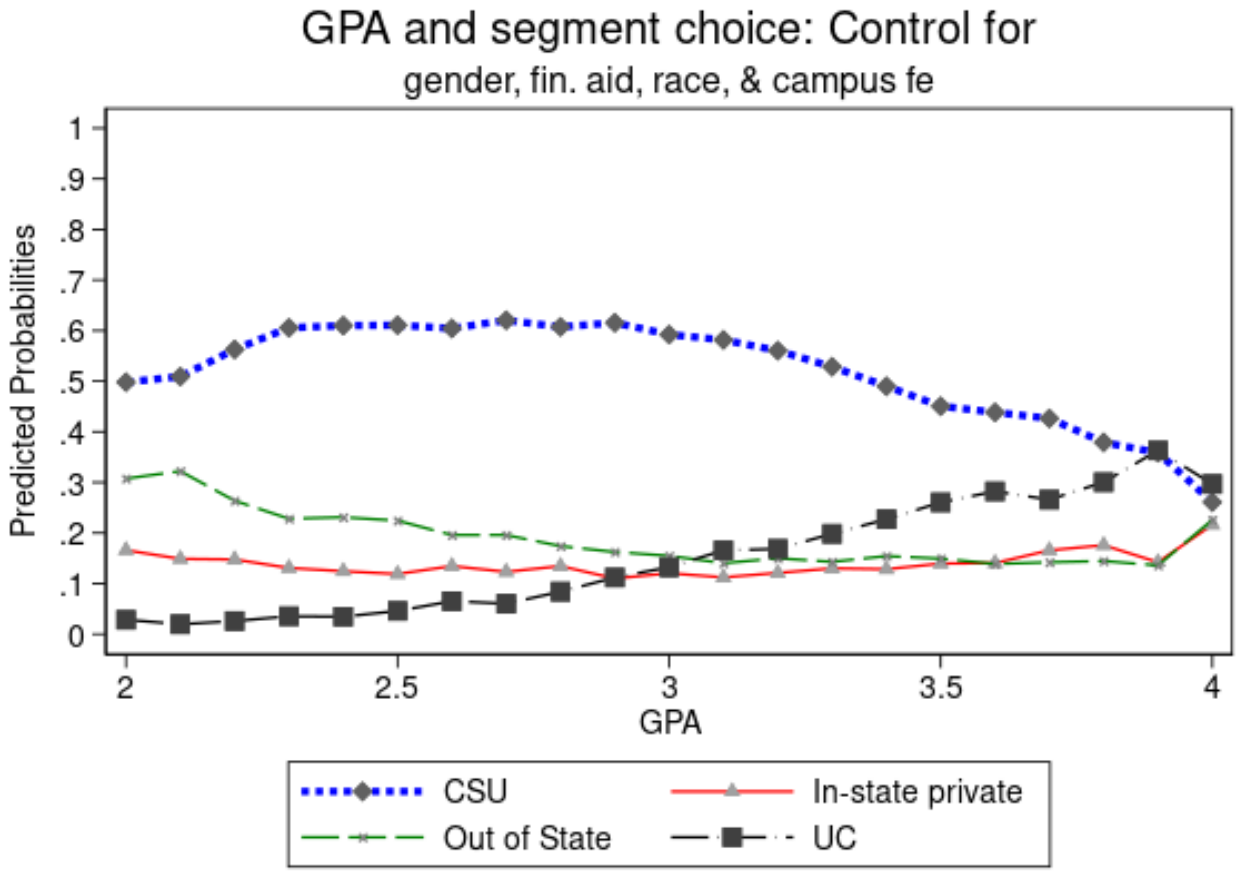
Figure 6



In Figure 7, we fitted another MLR model that is the same as the one we previously estimated and ran predicted probabilities to estimate the relationship between college choice and student GPA. After controlling for student level covariates and geographical factors, the relationship between GPA and segment choice is reduced relative to the results as shown in Figure 6. This may suggest that the explanatory power of student GPA on college transfer choice is mediated by student level characteristics and geographic factors. At the same time, there is still a positive relationship

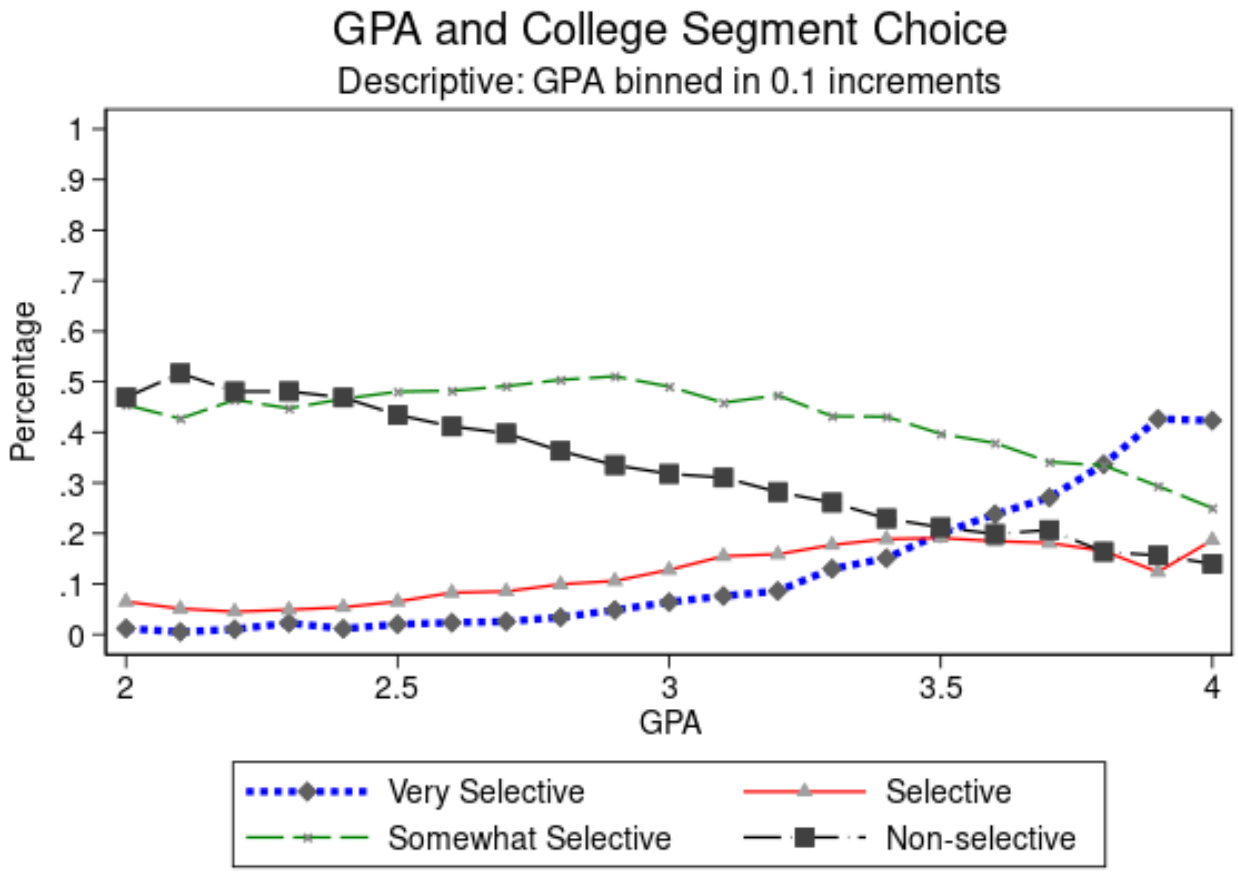
between GPA and attendance at a UC. There is a noticeable decline in the UC around the 3.70 GPA which also corresponds to an increase in in-state-private colleges and out-of-state institutions. This may suggest that students with very high GPAs are looking beyond the state's public institutions and expanding their college search.

Figure 7



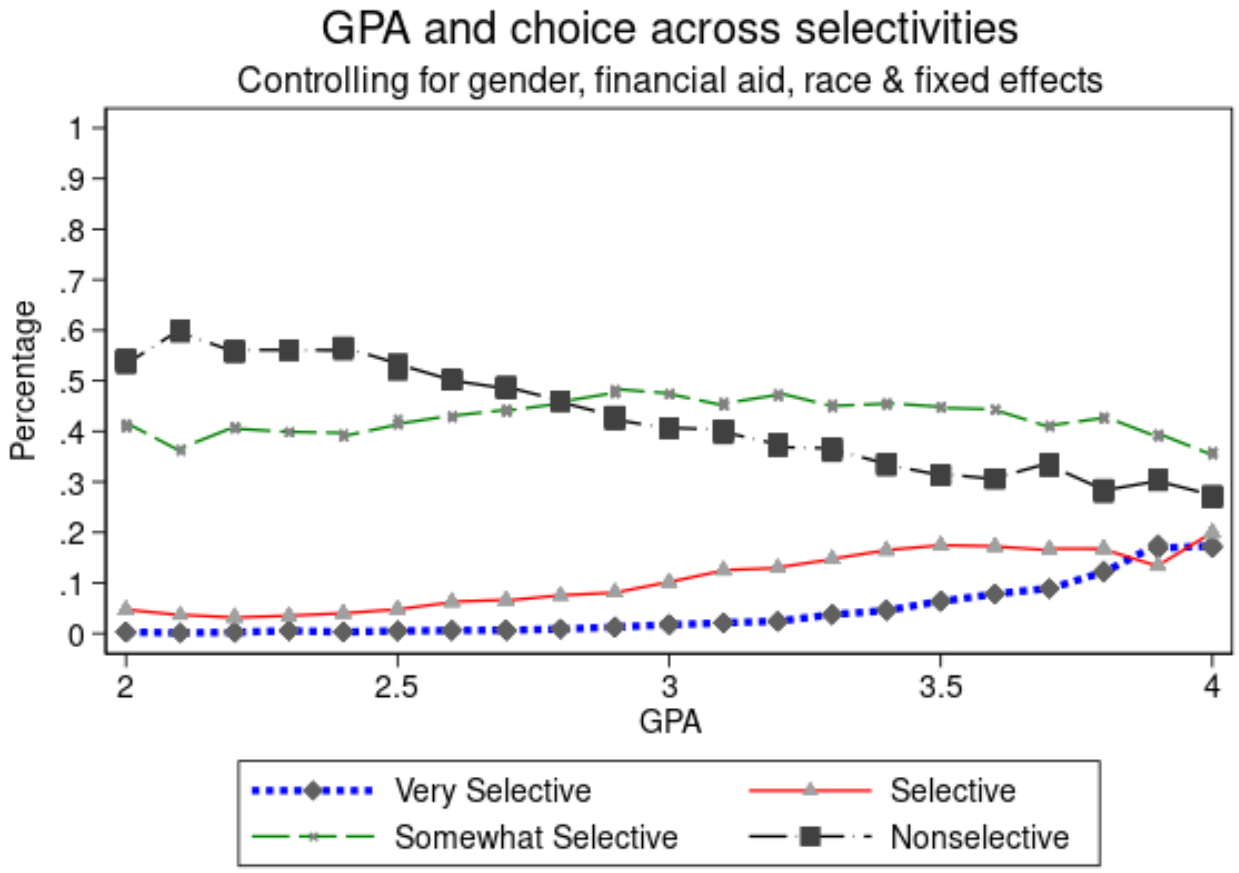
Using the selectivity categories, we also examined the relationship between GPA and transfer outcomes. In Figure 8, we find that students with higher GPA are choosing to attend more selective colleges. Along the same lines, we see less interest in the less selective institutions for students with higher GPAs. It should be noted that there are still some interests in the nonselective institutions for students with GPAs higher than a 3.50.

Figure 8



Finally, we ran similar predicted probabilities to examine the relationship between GPA and college selectivity and included student level characteristics and geographic indicators (Figure 9). We find that the relationship between GPA and college choice is reduced suggesting that the student level covariates and geographic indicators are driving a significant portion of the relationship. Compared with Figure 8, we find a much weaker relationship for choosing a Very Selective institution when we control for student and geographic characteristics. Some of the transfer gap is reduced when we compared individuals with similar attributes and experience similar conditions.

Figure 9



Conditional logit model results

We proceed to examine institutional level characteristics that may be associated with college choice decisions for different subgroups. Using a conditional logit model leverages the variation across institutional characteristics to estimate the likelihood that students attend a particular college. This analysis is motivated by our earlier findings suggesting differences in transfer patterns with Asian American students proportionally are more likely than their African American, Latinx, and White peers to attend a UC than a CSU even after controlling for individual level and institutional level covariates. We disaggregated students by the four largest racial categories in our dataset and ran separate conditional logit models to see how the see how choices are associated with institutional

level characteristics. Moreover, running a conditional logit model by different racial subgroups may reveal how students' demand for institutional characteristics is related to the transfer gap.

Moreover, we ran separate conditional logit models for students with different academic profiles to see if there were different demands for institutional characteristics. Like our earlier MLR models, we estimated conditional logit models for student above and below a 3.30 GPA to leverage the states' TAG agreement. Students with different academic profiles have different institutions to choose from. Students with at least a 3.30 GPA would be eligible to receive guaranteed admission to some of the more selective UCs which may influence their college choices and influence the type of institutional characteristics they are seeking from a campus. Conversely, students with less than a 3.30 GPA may desire certain institutional characteristics, but their choices may be constrained by eligibility requirements. Comparisons between these two subgroups may reveal how GPA mediates college choice.

We begin our analysis of the full sample of transfer students by examining the role of geography and location on students' college choices. In Table 4, odds ratios are reported, and standard errors are in parentheses. To interpret the results, coefficients greater than 1 suggests a positive relationship between the attribute and enrolling in a particular institution. We find the overall sample of students are less likely to attend institutions further away from their community college, but the effects are mixed across subgroups. The coefficients are smallest for Latinx students which suggests they are relatively less willing to attend a more distant college. Meanwhile he coefficient on distance is largest for African American students which suggest they are relatively more willing to attend a further school and least sensitive to distance. These results are mirror findings from Black et al. (2020) who found that among high school students in Texas, African Americans were least sensitive to distance and Latinx students more receptive to schools that were

closer to their place of residence. We also find that students with at least a 3.30 GPA are more likely than their peers with less than a 3.30 are less sensitive to distance when choosing institutions to transfer to.

We continued our analysis by examining the influence that institutional quality may be associated with college transfer choice. Using average SAT scores of incoming freshmen as a proxy for institutional quality, we find that for the entire sample, students are more likely to attend institutions that admit freshmen with higher SAT scores. At the same time, SAT scores have differential influences on college choice with Asian American, Whites, and higher GPA students more likely than the entire sample to choose to attend institutions with higher SAT scores.

These results should be interpreted cautiously because we are not able to determine if a student was eligible to attend an institution with a relatively higher GPA requirement. That is, we cannot distinguish between students choosing to attend colleges based on institutional characteristics or choices reflecting screening via selective admissions that is correlated with the characteristics included in the model. In the current analysis, we examined the relationship for students above and below a 3.30 GPA. Findings suggests that students with at least a 3.30 GPA are more likely to enroll in colleges with higher SAT scores while students below a 3.30 GPA do not exhibit such a behavior. Conditional on the assumption that some colleges have more stringent academic requirements, students with a relatively high GPA such as a 3.30 GPA should have more options. Of course, we do not have the data to distinguish enrollment choices conditional on admissions since which campuses students applied to and gained admission to. Moreover, it is possible that a 3.30 GPA may not be sufficient for some institutions in our choice set but we do not know these requirements. Students who did not have more competitive GPA could have applied to selective institutions but would have had very little chance for admission because they did not meet the minimum GPA requirement. We

address this further in the next section by establishing a higher GPA threshold which theoretically would ensure that this sample would be eligible for the vast majority of the institutions in our choice set and would have greater options to choose from.

We extended our analysis by investigating the relationship between campus spending on student amenities and college choice. Overall, we find limited relationships between college choice and spending on student services. We were unable to find similar relationships as Jacob et al. (2013) who found that high school seniors from 1992 and 2004 were more likely to attend institutions with more spending on student amenities.

We continued our analysis by scrutinizing the role that institutions' financial demands and support may influence transfer decisions. We find that grants are statistically significant for the overall sample and all the subgroups except for African American students. We found a particularly strong association between college choice and grants received at a unique institution for White students and students with high GPAs. We also examined loans taken out by the student body at a unique four-year college. We find our entire sample of community college students are more likely to attend four-year colleges where the student body takes out more loans but when we disaggregated the sample, the results are not statistically significant for African American and Asian American students. It may be possible that more students are taking out loans and this practice has been normalized such that it may not deter students from enrolling at these institutions. We also found that increase in tuition was associated with a lower likelihood of students enrolling at an institution. It appears that individuals are more attracted to lower cost institutions.

Finally, we studied institutional factors related to race to examine how this may influence college choice. For all racial subgroups, we find statistically significant relationships between the racial match and their likelihood of enrollment. Community college students were more likely to

transfer to institutions that had a larger percentage of the student body that matched their own race. This relationship between the racial composition of a campus and students own race is particularly sizable for African American and Asian American, and Latinx students.

Table 4: Full sample

	Table 1	Table 2				Table 3	
	All	AA	Asian	Latinx	White	>=3.30 GPA	<3.30 GPA
Geography							
Distance	0.749***	0.832***	0.758***	0.672***	0.764***	0.775***	0.727***
(100 miles	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Suburb	0.813***	0.703***	0.928*	0.780***	0.819***	0.778***	0.863***
	(0.01)	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)
Rural	0.310***	0.344***	0.305***	0.343***	0.324***	0.271***	0.365***
	(0.02)	(0.07)	(0.05)	(0.03)	(0.03)	(0.02)	(0.02)
Institutional Quality							
SAT Percentile	1.124***	1.043*	1.256***	1.043***	1.168***	1.368***	0.993
(per 10 points)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Research/FTE	0.993***	0.990	0.991**	0.993*	0.990***	0.983***	1.011**
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Instruction/FTE	1.021***	1.009	1.036***	1.016***	1.021***	1.036***	0.983***
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Student/Faculty	1.122***	1.096***	1.108***	1.112***	1.141***	1.113***	1.128***
Ratio	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Consumption Amenities							
Student Service/FTE	1.009***	1.011	1.000	1.011***	1.011***	1.007***	1.012***
($1,000)	(0.00120)	(0.00856)	(0.00233)	(0.00232)	(0.00163)	(0.00149)	(0.00321)

Table 4 Continued-

Auxiliary Expenditure/FTE	0.947***	0.997	0.930***	0.933***	0.948***	0.934***	0.946***
($1,000)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Financial Factors							
Grant	1.036***	0.999	1.032***	1.036***	1.049***	1.055***	1.019***
($1,000)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Loan	1.062***	1.042	1.031	1.062***	1.090***	1.114***	1.048***
($1,000)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Tuition	0.944***	0.961***	0.939***	0.941***	0.943***	0.929***	0.956***
($1,000)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Campus Diversity							
% AA	0.628*	32.35***	0.753	0.307**	0.158***	0.442*	0.510**
	(0.12)	(16.8)	(0.53)	(0.11)	(0.05)	(0.15)	(0.12)
% Asian	42.65***	37.46***	1031.5***	70.88***	5.918***	25.18***	75.00***
	(4.70)	(19.16)	(296.0)	(15.35)	(1.03)	(3.89)	(11.95)
& Latinx	3.327***	2.203*	1.127	12.91***	1.426**	2.753***	3.397***
	(0.29)	(0.84)	(0.26)	(2.20)	(0.19)	(0.34)	(0.42)
% White	2.391***	0.581	0.384***	6.602***	2.705***	0.981	4.240***
	(0.23)	(0.22)	(0.10)	(1.31)	(0.38)	(0.13)	(0.60)
N	43590	1642	6387	16013	14634	17793	25797

Exponentiated coefficients; "* = p<0.05, ** = p<0.01, *** =p<0.001"
Standard errors in parentheses

Subgroup 1: In-state students

We subsequently examined students who transferred within the state of California since in-state students represent 88 percent of our sample. We wanted to compare students who enrolled at

in-state colleges with the overall sample to see how geography mediates college choices. We previously reported that our full sample were less likely to attend further institutions but students who attended out-of-state colleges only represent 12 percent of the sample and their willingness to cross state borders may diminish the influences of location on in-state students' college choice.

Our results from the in-state students is interesting and reveals sensitivity to distance between where they attended a community college and where they want to pursue a bachelor's degree. We find that distance may be a greater factor for in-state students compared with the full sample in Table 4; coefficients for the in-state sample of students (Table 5) were noticeably lower than the full sample that included students who transferred out of state (Table 4). Moreover, Latinx students and students with lower than a 3.30 GPA were less likely to transfer to a more distanced four-year college than the entire in-state sample while Asian Americans, African Americans, and students with at least a 3.30 GPA had a greater likelihood of attending a more distance four-year college than the entire in-state sample.

After finding out that in-state students are very sensitive to distance, we wanted to see location impacted demand for other institutional factors. For the in-state students, institution's average SAT score is positively correlated with enrollment. Even so, Asian Americans and higher GPA student subgroups have a greater probability than the entire in-state sample of choosing institution with higher average SAT scores. Moreover, students do not appear to be significantly influenced by an institution's research expenditure, but they may be more drawn to the instructional expenditure. Finally, students are more likely to transfer to institutions with higher student to faculty ratio. This may partially be explained by the prevalence of students who choose a CSU or a UC which have larger student to faculty ratios than some of the in-state private schools.

Next, we examine the role that students are influenced by consumption amenities offered at the colleges in our choice set. We find that student interest in an institution is statistically significant for the sample of in-state students, but practically the coefficient is minimal. These results are consistent across the subgroups. Likewise, we find that students are less likely to attend institutions that spend more on auxiliary amenities such as school sports or campus newspapers. Once again, our results differed from Jacob et al. (2013).

We subsequently moved towards the financial factors that influence college choice. We find that in-state students may be more sensitive to the cost of higher education and may be attracted to institutions that offer more financial aid. In-state students and each of the subgroups were more likely to enroll at institutions that offered more grant money. The relationship between the average loan taken out by students enrolled at a particular institution and college choice was decidedly more mixed. Asian Americans were less likely to attend institutions where students took out more loans while Latinx and White students were more likely to attend these institutions. Finally, average tuition was associated with college choice with students less likely to attend institutions with higher cost which was consistent with our overall sample.

We conclude our analysis of in-state students by examining the racial characteristics of the in-state institutions. Similarly, to our overall sample, we found that strong associations between a student's race and an institution's racial composition. Asian, African American, and Latinx students were more likely to transfer institutions with student bodies that matched their own race.

Table 5 In-State Sample

	Panel 1	Table 2					Table 3	
	All	AA	Asian	Latinx	White	Other	>=3.30 GPA	<3.30 GPA
Geography								
Distance	0.358***	0.435***	0.460***	0.271***	0.388***	0.392***	0.427***	0.304***
(100 miles)	(0.00)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
suburb	0.664***	0.557***	0.851***	0.645***	0.638***	0.680***	0.652***	0.689***
	(0.01)	(0.05)	(0.03)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)
rural	0.270***	0.276**	0.257***	0.350***	0.222***	0.346***	0.246***	0.332***
	(0.02)	(0.11)	(0.04)	(0.04)	(0.03)	(0.07)	(0.03)	(0.03)
Institutional Quality								
SAT Percentile	1.085***	1.104**	1.261***	0.995	1.077***	1.098***	1.373***	0.905***
	(0.01)	(0.04)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Research	0.992***	1.000	0.989**	0.995	0.989***	0.982*	0.981***	1.017***
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Instruction	1.017***	1.008	1.032***	1.013***	1.020***	1.020***	1.037***	0.969***
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Stu./Fac. Ratio	1.106***	1.115***	1.092***	1.093***	1.125***	1.125***	1.101***	1.108***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Consumer Amenities								
Stu. Service	1.012***	1.009	1.004	1.012***	1.013***	1.021**	1.009***	1.016***
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Auxiliary	0.907***	0.899***	0.941***	0.878***	0.907***	0.921***	0.911***	0.872***
Expend. ($1,000)	(0.00)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial Factors								
Grant	1.074***	1.055***	1.024***	1.087***	1.103***	1.055***	1.073***	1.085***

Table 5 continued-

($1,000)	(0.00)	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
Loans	1.013	0.997	0.928**	1.032*	1.065***	1.055*	1.068***	0.980
($1,000)	(0.01)	(0.05)	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Tuition	0.918***	0.935***	0.933***	0.907***	0.911***	0.926***	0.913***	0.919***
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Campus Diversity								
% AA	0.027***	31.440***	0.086*	0.011***	0.003***	0.316	0.026***	0.009***
	(0.01)	(26.12)	(0.09)	(0.00)	(0.00)	(0.21)	(0.01)	(0.00)
% Asian	58.609***	23.206***	1927.802***	72.769***	10.585***	94.097***	26.411***	193.199***
	(8.89)	(20.40)	(709.10)	(20.26)	(2.64)	(39.86)	(5.21)	(45.56)
% Latinx	4.597***	1.585	5.265***	8.069***	1.607*	1.924	6.978***	2.493***
	(0.57)	(1.11)	(1.62)	(1.76)	(0.33)	(0.68)	(1.21)	(0.46)
% White	21.142***	3.495	1.939*	38.798***	36.572***	12.133***	5.069***	81.936***
	(2.82)	(2.69)	(0.65)	(9.60)	(7.72)	(4.55)	(0.86)	(17.20)
N	38384	1172	6014	14782	15892	4282	15892	22492

Exponentiated coefficients; "* = p<0.05, ** = p<0.01, *** =p<0.001"
Standard errors in parentheses

High Performing Students

We conducted additional analyses by examining the choices of students with a relatively higher GPA (Table 6). We were mindful that we could identify which students may qualify academically for all colleges in our choice sets. Thus, students may be attracted to a particular institutional feature, but they may not qualify academically to enroll. Therefore we did a set of additional analyses limiting the sample to students who have a community college GPA of at least 3.6. We chose this cutoff to ensure that students could get into most of the institutions in the choice set while still retaining a large enough sample to look at parameter estimates by race.

For this subsample of high performing students, we were primarily motivated to examine the relationship between college quality and their college choices. We find that institutions with higher SAT scores for incoming students are positively associated with increase in enrollment from our sample of students who have at least a 3.60 GPA (Table 6). Our results for this subsample by and large follow in the same direction as the full sample and the in-state student samples but the effect sizes are strikingly larger. Across all racial groups, we find that this subsample is even more likely to attend institutions with higher average SAT scores, suggesting that high-GPA students have a strong preference for more selective institutions.

These findings motivated us to examine other institutional factors that students may be seeking out. It appears that this group of students are less sensitive to distance when choosing to attend a college compared with the only in-state enrolled students. Across our different racial groups, Latinx student consistently are more sensitive to distance, and they appear to be less receptive to attending institutions further away from where they attended a community college. We also find that these high performing students are open to attending institutions where the student body are more likely to take out larger amounts of loans. As students are attending more selective institutions, they

Table 6: GPA 3.60 or higher

	Panel 1	Panel 2				
	Full sample	AA	Asian	Latinx	White	Other
Geography						
Distance	0.796***	0.816***	0.829***	0.754***	0.786***	0.817***
(100 miles)	(0.00)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
Urbanicity (Urban is reference group)						
suburb	0.690***	0.606*	0.779***	0.697***	0.696***	0.625***
	(0.02)	(0.13)	(0.05)	(0.04)	(0.03)	(0.05)
rural	0.257***	0.000***	0.172***	0.341***	0.286***	0.186***
	(0.03)	(0.00)	(0.07)	(0.08)	(0.05)	(0.08)
Institutional Quality						
SAT Percentile	1.484***	1.565***	1.739***	1.370***	1.431***	1.511***
	(0.02)	(0.11)	(0.04)	(0.03)	(0.02)	(0.04)
Research	0.979***	0.984	0.985***	0.970***	0.974***	0.981***
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Instruction	1.044***	1.035**	1.051***	1.049***	1.043***	1.032***
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Stu./Fac. Ratio	1.112***	1.108***	1.118***	1.100***	1.124***	1.104***
	(0.00)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
Consumption Amenities						
Stu. Service/FTE	1.005*	1.011	0.991**	1.010**	1.011***	1.010*
($1,000)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Aux. Expend./FTE	0.936***	0.905**	0.917***	0.939***	0.939***	0.938***
($1,000)	(0.00)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)

Table 6 continued- Financial Factors						
Grant	1.058***	1.041	1.058***	1.056***	1.061***	1.066***
($1,000)	(0.00)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
Loan	1.124***	1.132	1.188***	1.134***	1.126***	1.125***
($1,000)	(0.01)	(0.10)	(0.03)	(0.03)	(0.02)	(0.04)
Tuition	0.927***	0.934***	0.923***	0.924***	0.931***	0.921***
($1,000)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)
Campus Diversity						
% AA	0.294**	10.366*	0.207*	0.226	0.126***	0.203
	(0.11)	(11.83)	(0.13)	(0.18)	(0.07)	(0.20)
% Asian	12.144***	6.718	87.883***	11.967***	5.983***	8.106***
	(2.36)	(8.09)	(36.66)	(5.24)	(1.80)	(4.09)
% Latinx	2.098***	2.060	0.464*	9.804***	1.789*	0.899
	(0.34)	(2.23)	(0.18)	(3.56)	(0.44)	(0.37)
% White	0.473***	0.095**	0.034***	0.633	1.362	0.174***
	(0.08)	(0.09)	(0.01)	(0.24)	(0.34)	(0.07)
N	9618	164	2005	2171	4130	1148

Exponentiated coefficients; "* = p<0.05, ** = p<0.01, *** =p<0.001"
Standard errors in parentheses

may be willing to accept more debt. At the same time, the influence on racial match are not statistically significant for African American and White students. Racial match is still statistically significant for Asian Americans and Latinx students, but their coefficients are attenuated.

Discussion

In summary, our goal of this analysis was to examine the transfer destinations for a cohort of California community college students. While there were more than 900 unique four-year colleges throughout the United States in our choice set, most students transferred to the states' public institutions, the CSUs and the UCs. Consistent with literature on college choice for high school seniors (B. T. Long, 2004; Skinner, 2019; Turley, 2009), our sample of students are sensitive to the location of a four-year college and balk at attending institutions further away from the community college that they attended.

When we examined the four largest racial groups in our sample, we found that Latinx students are least likely to attend more distant four-year colleges. We further relied on the extensive literature on college choice for high school seniors to identify additional institutional characteristics of four-year colleges that may drive enrollments for our sample of community college students. We examined how institutional quality, consumption amenities, financial factors, and the diversity of the campus may be associated with transfer choices. Of note, we find that community college students are more likely to attend institutions that admit students with higher SAT scores. Moreover, of the four racial groups we examined, we found that Asian Americans were more likely to attend institutions whose students had higher SAT scores. In addition, individuals were less likely to attend institutions with higher tuition. At the same time, we found that students were still more likely to attend institutions where the student body incurs more student loans. Finally, in light of the diversity

in the state of California, we found that our sample of students were more likely to attend institutions where the share of students matched their own.

Based on these findings that students are sensitive to distance when selecting colleges to transfer to, we conducted additional analysis on students who transferred within the state, and we dropped students who crossed state lines. We found these in-state were even more sensitive to distance and Latinx students once again were more resistant in attending more distant four-year colleges. We also found that in-state students were more likely to attend institutions that offered their student body more grants and had lower tuition.

Because we could not determine which students would be academically eligible to attend the institutions in our choice set, we conducted a more granular analysis by focusing on students with at least a 3.60 GPA. This subsample of students would more likely be eligible for most of the institutions in our choice set. This subsample exhibited greater likelihood of attending institutions that had a student body with higher incoming SAT scores and these findings were most prominent in Asian Americans.

Conclusion

This analysis offers to a more nuanced understanding of college choice for community college transfer students. We extend Jabbar and Edwards (2020) by using National Student Clearinghouse data to follow our sample of California students who transferred in-state and out-of-state institutions. Jabbar and Edwards (2020) tracked Texas community college students who transferred to a postsecondary institution within the state but as our descriptive results indicate, almost 12 percent of California community college students leave the state. Inclusion of students who leave the state of California allows us to better estimate the influence of the location of the four-year college on college choice.

We developed similar conditional choice model as Jabbar and Edwards (2020) to examine college choice for community college students and the added valued from our research comes from our specific analysis examining the transfer patterns for different racial groups. As the largest state in the country, California is also home to an immensely diverse population which allows us to see examine how transfer patterns vary by racial groups. Our results suggest that different racial groups are disproportionally clustered at postsecondary institutions with different academic and selectivity profiles which may be associated with demands for different institutional demands. In particular, we find that African American and Latinx are not proportionally represented at more selective institutions even after our attempts to control for GPA.

Further research should examine the recruiting practices of postsecondary institution towards African American and Latinx students. The state of California has a sizable population of high performing African American and Latinx students who could thrive at more selective institution.

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Chapter 2: From Community College to Selective Four-Year University: Using Social Network Analysis to understand College choice for Community College Students

Abstract

More students interested in earning a bachelor's degree are opting to first attend a local community college before transferring to a baccalaureate granting institution. This mixed method study examined where community college students submit transfer applications and to understand the motivation behind their choices. In partnership with several community colleges in Northern California, I surveyed 115 students to gather information about the colleges to which they applied to transfer. Social Network Analysis was used to examine the kinds of colleges that students aspired to attend. Interviews were also conducted with 31 students to acquire a nuanced explanation of their choices. Initial findings suggest that college prestige strongly influences students' choices as does geographic proximity. Moreover, students' eventual transfer outcomes are limited by transfer policies of the four-year universities to which they apply.

Introduction

Recently, there has been a spate of interest in increasing the pool of individuals with a bachelor's degree to ensure that the labor market is stocked with qualified workers (Carnevale et al., 2011; Johnson et al., 2017). Providing individuals with the opportunities to acquire more human capital may help them compete for jobs (Becker, 1962) because bachelor's degree holders experience an ever increasing substantial earnings premium relative to individuals with only a high school degree (Autor, 2014). While the demand for postsecondary education has increased, politicians and policy influencers are increasingly turning their attention to the community college system to play a larger role in helping students access postsecondary education and earn a bachelor's degree (Carnevale et al., 2020; Geiser & Atkinson, 2010b; Holzer & Baum, 2017).

As open access institutions of higher education, community colleges serve a diverse population, including first generation college students and working-class individuals. Students may

be attracted to the low tuition that is often relatively more affordable than baccalaureate granting institutions (Goldrick-Rab, 2010) and they are often geographically more accessible to more people (N. Hillman & Weichman, 2016). Students who enter a community college are more likely to be first generation college students, financially in need (Calcagno et al., 2008), and require developmental education to become college ready (Chen, 2016; Scott-Clayton & Rodriguez, 2015). At the same time, community colleges have faced persistent critiques due to their low success rates with average transfer rates ranging between 10 to 40 percent (Adelman, 2005; Bailey, 2015; Shapiro et al., 2017).

Despite the low rates, a majority of community college students initially had intentions to transfer and earn a bachelor's degree (Horn & Skomsvold, 2011) However, we have limited understanding of how students make their college transfer choices. When students transfer from a community college to a four-year university, they may decide to attend an institution that is less selective than what they could be admitted to given their academic achievements. This phenomenon, known as "college mismatch" has been studied for high school students deciding which college to attend (C. Hoxby & Avery, 2012a; C. Hoxby & Turner, 2015b). However, little research exists on the extent to which undermatching is an important phenomenon among community college transfer students. Earlier research by Cheslock (2005) found a negative relationship between transfer students and the selectivity of an institution; that is, the more selective the institution, the lower the percentage of enrolled transfer students. Likewise, Dowd et al., (2008) examined enrollment numbers at elite four-year colleges and found that community college transfer students made up a small proportion of the student body and most were primarily from higher socioeconomic backgrounds.

College transfer choices can have consequences on students' academic and labor market outcomes. Prior studies have demonstrated a significant association between a college selectivity and

higher probabilities that attendees earn an undergraduate degree (Alon & Tienda, 2005; M. C. Long, 2008; Melguizo, 2008), and do so in a more timely manner. Moreover, students who attend a selective institution are also more likely to subsequently pursue graduate education (Eide et al., 1998; Ge et al., 2018) and pay off student loans (Andrews et al., 2016; Black et al., 2005; Brewer et al., 1996; M. C. Long, 2008; Loury & Garman, 1995). Additionally, there have been substantial research suggesting positive labor market benefits to attending more selective colleges such as greater lifetime earnings (Andrews et al., 2016; Black et al., 2005; Brewer et al., 1996; M. C. Long, 2008; Loury & Garman, 1995), access to elite jobs (Rivera, 2010), and pathways to corporate management positions (Useem & Karabel, 1986).

This research is set in California which has a unique higher education policy that affects community college students. Under the state's Master Plan on Higher Education, specific roles are assigned to the three public postsecondary education organizations, the University of California (UC), the California State University (CSU) and the California Community College system . While the UC and CSU systems focus on conferring bachelor's degrees, California community colleges offer higher education to any individuals who believe they can benefit from it, including those that aspire to complete their lower division units and then transfer to a four-year college. To ensure a smooth transition, California has articulation agreements between the state's community colleges and the UC and CSU system, respectively. As a result, students attending a state community college have direct pathways to transfer to broad access and selective institutions.

In my study, I find that students have specific preferences when they transfer, to briefly preview the results: Prestige plays a prominent role in students' college choices with students expressing an interest to attend the more selective public colleges in California. Considering California's approach to directing community college students to the states' public four-year

colleges, I find that students are more interested in applying to the UCs because transfer policies and course requirements to transfer are more readily available than in-state private and out-of-state colleges. Students were also more reluctant to apply to in-state private or out-of-state colleges for geographic reasons.

The structure of this papers is as follows: Section II offers the theoretical framework that motivates this study; Section III provides a literature review; Section IV explains the methods and data structure; Section V presents the results; Section VI concludes with implications of my findings.

Section II: Theoretical framework

Theories on College Choice Process

Prior literature has examined different stages that high school seniors navigate to select a college to attend. I draw upon the three stage College Choice Model (Hossler & Gallagher, 1987) which deconstructs the different steps that high school students take to enroll in a four-year college. The first stage is known as the predisposition stage where individuals consider whether they want to pursue higher education. Hossler and Gallagher (1987) note that student's socioeconomic status, parental attitude about higher education, high school peers, high school performance and participation in extracurricular activities may influence the desire to attend college. The second stage is known as the search period, where high school students gather information about higher education options. Hossler and Gallagher argue that students may have imperfect information about colleges and are often influenced by their high school achievements. The third stage is the choice phase when students may have a set of colleges to select from. Hossler and Gallagher says that students will consider institutional factors such as the perception of the quality of education or the financial aid that they are offered.

However, if we assume that students act in a rational manner as they traverse through each stage in Hosseler and Gallagher's model, we may overlook organizational constraints that shapes their choices. Under a Rational(Simon, 1997) choice theory (Becker, 1962) framework, students gain access to all the available information needed to make a rational choice, expertly estimate the expected cost and benefits for institutions in their choice set, and then enroll in the college that offers the ideal amount of utility from their decisions. The reality may not be this simple; students confront a increasingly complex college choice process where they consider diverse higher education institutions with multiple missions (Stevens et al., 2008), and encounter a grossly convoluted financial aid system in need of reform (Bettinger et al., 2012). Working class or first-generation students may also not exercise as much agency or power in the decision-making process because they may have less access to information to make a rational choice, or limited parental guidance to consider their options (Perez & McDonough, 2008).

As a result, bounded rationality theory may be an alternative approach to examine college choices for community college students. Simon (1997) formulated bounded rationality theory to critique rational choice theory and the premise that individuals make informed decisions and maximize utility by considering the true cost and benefit of their choices (Becker, 1993). Simon (1997) questions this premise, noting that decisions can be made under uncertainty or a lack of ideal information. While there may be many options available, a decisionmaker may not be aware of all of them or the expansive options can lead to cognitive overload. As a result, individuals may not conduct their due diligence on the population of options; rather they may select an option that meets their minimum needs which Simon describes as "satisfic[ing]" (1965). Finally, some decisions are so complex that individuals may struggle to make the best decision for themselves.

Literature Review

College Choice for high school seniors

Students' college choices may be influenced by a host of institutional characteristics. Unlike secondary education, higher education lacks a standardized assessment to evaluate quality. As a result, some scholars use Barron' Selectivity index (Dale & Krueger, 2011), SAT scores of entering freshmen (Dale & Krueger, 2002), faculty characteristics (B.T. Long, 2004; Skinner, 2019) or a composite index using a number of these factors (Dillon & Smith, 2017; M.C. Long, 2008). There has also been some debate about whether the US News and World Report rankings measure institutional quality or perceptions of institutional prestige (Ehrenberg, 2003; Monks & Ehrenberg, 1999; Pike, 2004) but institutions have seen an increases in student applications when their rankings increased (Bastedo & Bowman, 2010). Another approach to operationalize institutional quality is to measure institutional expenditure; for example, Long (2004) examined high school graduates from 1972, 1982, and 1992 and found that demand increased for institutions with increased institutional spending.

As students weigh aspects of college quality, financial considerations may also contribute to their decisions. Students' college choices have been associated with the costs of attendance (B. T. Long, 2004), though more recent studies suggest that current students may be less sensitive to these postsecondary expenses (Skinner, 2019). Low income students may be particularly sensitive to financial cost of different post-secondary options, and thus have an increased likelihood of enrolling at lower cost institutions (Ovink et al., 2018). Moreover, low income, high achieving students are more likely to undermatch (C. Hoxby & Avery, 2012b) and not apply to selective colleges due to the sticker price (i.e., the tuition that institutions publicly publish) (Hoxby & Turner, 2015), or overestimate the cost of attending (Grodsky & Jones, 2007). However, interventions have shown that

high achieving, low-income students were more likely to submit an application to selective institution when their financial needs were addressed. When students were provided with information about the amount of financial aid available to them to reduce the net cost of attending a selective college (Hoxby & Turner, 2013), or a generous offer of tuition free enrollment (Dynarski et al., 2018), low income high achieving students were more likely to match with a selective institution.

The geography of opportunity may also influence students' college choice. Students who live close to a college are subsequently more likely to submit an application (Turley, 2009a). However, some groups such Latinx students and students inhabiting areas with lower educational attainment are also more likely to live in education deserts or places that have limited postsecondary institutions within their immediate vicinity (N. W. Hillman, 2016). As a result, individuals who live in these educational deserts and want to pursue postsecondary education are subsequently more likely to apply and enroll in college further away from their home (Klasik et al., 2018). However, moving away from home to pursue a postsecondary education is not an option for everyone. Using College Board SAT questionnaire data, Niu (2015) examine where high school students sent their scores. Higher performing students, White students, and students with parents were more likely to consider an out-of-state school while Latinx students have a lower likelihood of sending their scores to out-of-state colleges. Latinx students' college preferences may be partially explained by their preference to live at home while attending college (Desmond & López Turley, 2009). This broad range of research suggest that geospatial factors are an important component to explain students' college choices.

College choice for community college transfer students

Enrollment in the nation's public community colleges has increased faster than at public and private four-year colleges, respectively (Ma & Baum, 2016). With enrollment rates at community colleges were increasing (at least in the pre-pandemic period), more students are using these open access institutions to pursue higher education and as a route to a four-year college to earn a bachelor's degree. When students transfer, they may have the academic achievement to enroll in a more selective college than the institution that they end up choosing to attend. Limited research have found that transfer students were less represented at more selective institutions (Cheslock, 2005; Dowd, Cheslock, & Melguizo, 2008; Dowd & Melguizo, 2008). Bensimon and Dowd (2009) interviewed five California community college students who attributed transferring to a selective four-year college to strong social relationships that they developed at their community college campus. They posit that failure to identify advocates on campus led some students to struggle academically and subsequently not transfer to a selective college (Bensimon and Dowd, 2009).

Conceptual Framework

While the three stage College Choice Model is applied to high school students looking to enroll in postsecondary education, it may also be applicable to community college students interested in transferring to a four-year college. I modify Hossler and Gallagher's College Choice Model by adding a stage which characterizes a student's experience while enrolled in a community college. I propose that including the period that students are enrolled in a community college to Hossler and Gallagher's College Choice Model is a key adaptation because many students attend multiple postsecondary institutions, with a great majority starting at open-access community colleges.

Many students apply to multiple colleges with varying degrees of selectivity. In fact, College Board, the administrator for the SAT, encourages students to send their SAT scores to multiple universities including what might be considered "reach schools" (i.e., institutions that students feel they are unlikely to get into on the basis of their academic records, namely test scores) (Avery et al., 2014). Thus, taking consideration of students' entire choice set may better reflect students' choices and reveal the type of institutions are interested in attending.

Applying SNA Conceptual Framework to CC choice

To examine students' entire choice set, I use Social Network Analysis (SNA). SNA is useful when analyzing the relationships between a set of units, such as actors in an organization (Hanneman & Riddle, 2005), and the role of social structures that may help or hinder behavior based on an individual's position in the network (Borgatti & Everett, 1997). In this study, my units of analysis are community college students and the four-year institutions they applied to as transfer students. Social networks which have different units of analysis are called two-mode networks or affiliation networks (Borgatti & Everett, 1997). Interpreting students' college choices as affiliation networks may reveal which students share similar aspirations. Students with comparable academic goals or career ambitions may wind up selecting similar college destinations. At the same time, it is also possible that students who share these commonalities but differ in socioeconomic background will construct different college choice sets. Conversely, examining college choice through a SNA framework may reveal the extent that higher education policies foster social structures that constrains and shapes the lived experiences of those who inhabit them (Davis et al., 1941). Students can submit college applications to a variety of schools so the typology of students' choice sets may reveal students' assumptions about the accessibility of certain institutions. Students who encounter

these real and perceived barriers in the college application process may subsequently undermatch. Students are not necessarily purposefully limiting themselves when they apply; rather they may be responding to a higher education sector that may be limiting their choices while promoting undermatching. Understanding what college options students believe they have access to may point towards the barriers and limitations established by postsecondary institutions.

Research questions

In this study, I seek to uncover the college application behavior for community college students and reveal the preferences that motivate their decisions. My research questions are:

1. What four-year colleges are community college transfer students submitting applications to?
2. How are the four-year colleges that community college student submitted transfer applications related to each other?
3. Why are community college students interested in applying to these select four-year colleges?

I will conduct a sequential mixed method study to answer my research questions. To answer Research Question 1 and 2, I will Social Network Analysis to identify the profile of schools that students are submitting applications to. SNA is an appropriate method to determine the types of postsecondary institutions that students are interested in attending. Moreover, SNA can reveal the relationship between the schools in a students' choice set. For example, SNA may reveal that students prefer selective institutions, or public schools within a particular geographic area. Research Question 3 examines why students have preferences for specific types of postsecondary institutions and I provide an answer by interviewing 31 community college students to identify factors that

influenced where they submitted a transfer application. In the process of answering the three research questions, I hope to reveal what motivates students' transfer choices.

Background

The California Master Plan

The California Master Plan on Higher Education (Coons et al., 1960) articulates California's public higher education system, specifically the selective University of California institutions (UCs) which includes nine undergraduate serving colleges and the more broad access California State University system (CSUs) which has twenty-three campuses. The Master Plan stipulates that the UC campuses are responsible for conducting research and conferring doctoral degrees and are to be reserved for the top 12.5% of California high school graduates eligible to attend. The CSU campuses focuses on undergraduate teaching and targets the top 33% of California's eligible high school graduates. The California Community Colleges are entirely open-access, intended for all individuals who can benefit from higher education.

According to California's Master Plan, community colleges have several missions. Community colleges provide students with the opportunity to enroll in developmental education so they can become college ready, they offer work force training programs to develop labor market skills, and teach lower division courses so individuals can meet the requirements to transfer to a four-year college. The California Community Colleges have tried to live up to this last mission to help students transfer to one of the state's public baccalaureate granting systems. Currently, approximately 40 percent of students attending a community college in California transfer to a four-year college within six years (California Community Colleges Chancellor's Office, 2019). For CSU graduates, 51 percent started at a community college, and 29 percent of UC graduates, originally began at a community college (California Community Colleges Chancellor's Office, 2019).

The UC and CSU system also have detailed articulation agreements with the states' community colleges to help with the transfer process. Articulation agreements are pacts between a community college and a four-year college; four-year college stipulate which community college courses will meet their admissions requirements or identify which community college courses will count as units towards the bachelor's degree (Roksa & Keith, 2008). Articulation agreements between each unique public four-year college in California and the states' community colleges were further cemented under State Assembly Bill 1861 (2000).

California's community college system continues to serve as a starting point for many students interested in earning a bachelor's degree due to education policy reforms that promote transferring. A decade has passed since the implementation of the Associates Degree for Transfer (ADT) program which established statewide standards for degree completion between California's community colleges and the CSU system (California Community Colleges: Student Transfer SB-1440). California community colleges developed transfer programs that clearly laid out specific lower division coursework that would be accepted across all CSU campuses for a host of majors. The ADT program streamlined the transfer process for many students and participants of the program were more likelty to transfer to a CSU (Baker, 2016).

Like the ADT program for the CSU system, the UC system also has a direct relationship with the state's community colleges. For this study, I exploit a program which is called the Transfer Admission Guarantee (TAG) that exists exclusively between California's community colleges and some of the state's selective public institutions within the UC system. The TAG agreement provides a written promise for admission to one of six participating UC campuses as long as students meet a GPA requirement and complete 60 transfer units (*Transfer Admission Guarantee*, n.d.). Table 1 lists the campuses of the UC system that participate in the TAG requirement, the minimum GPA needed

to ensure a guaranteed admission into that respective institution, and the part of California it is located in. With UC campuses located throughout the state, high performing community college students potentially have an established pathway to transfer to a selective college. However, it is worth noting that the state's three most selective UC campuses (Los Angeles, Berkeley, and San Diego) do not participate in the TAG program.

Table 1

Campus name	Participates in TAG	Minimum GPA	Part of California
UC Berkeley	No	N/A	Northern
UC Davis	Yes	3.33	Northern
UC Irvine	Yes	3.40	Southern
UCLA	No	N/A	Southern
UC Merced	Yes	3.00	Central
UC Riverside	Yes	3.00	Southern
UC San Diego	No	N/A	Southern
UC Santa Barbara	Yes	3.33	Southern
UC Santa Cruz	Yes	3.00	Northern

Setting

This study examines the transfer process of California community college students more closely. Specifically, I collaborated with the institutional research departments of two community colleges. To protect the identity of the partner schools, I assign pseudonyms to these colleges: Bixby Community College (BCC) and Suburban Community College (SCC). BCC serves a student population with more African American and Asian American students than the state average (Table

2). Meanwhile, SCC is located in an agricultural part of Northern California and primarily serves White and Latinx students. While these two institutions are approximately 40 minutes apart, student outcomes differ substantially, with BCC and SCC reporting transfer rates of 46.58 percent and 35.93 percent, respectively. Although not designed to be generalizable, together, BCC and SCC can provide important insights about what influences transfer outcomes across the diversity of the state's community college system. To protect the identity of the two partner schools, I report the racial groups by ranges.

Table 2 Demographics of Partner School

	California CCs	BCC	SCC
African American	6.98%	15-20%	10-15%
Asian	11.34%	20-25%	6-10%
Latinx	38.68%	20-25%	25-30%
White	30.36%	25-30%	29-30%
Student Pop.	1,582,302	~4,000	~10,000
Transfer rates	39.68%	46.58%	35.93%

Data Collection

To understand the set of colleges that students apply to, a survey (Appendix 1) was sent to students enrolled at BCC and SCC. Students were asked to list the four-year colleges that they applied to and rank the institutions by their preference. Students were given up to ten slots to list the colleges that they applied to; while it is possible that students could apply to more than ten schools, I was concerned that providing too many slots would overwhelm students. Besides collecting the set of colleges that students applied to, I also asked each student to share their demographic and socioeconomic information. Students were prompted to provide information such as their race,

gender, parents' educational attainment, financial aid status, and work history. Data collection began in February and ended in July of 2020.

Target Population

In collaboration with the partner community colleges, I identified students with at least a 3.00 GPA and 45 completed units by the end of the Fall of 2019. Not all these students may be interested in transferring but they are relatively high performing students. We were particularly interested in these students since they would be eligible for the TAG agreement which offers them admission to a UC campus. Moreover, students need to complete at least 60 units in order to transfer. We assumed that students who had completed 45 units by the Fall of 2019 could take a full course load, which is 15 units, and meet the 60 unit requirement to transfer by Spring of 2020. Subsequently, we sent students an initial email explaining the project and asked them to participate. A follow up email was sent to students one week later. Approximately 120 students at BCC and SCC completed the survey instrument.

Data and the Methods

Since the units of analysis (students and colleges) are different, we have a bipartite or two-mode network. Data are stored in an edgelist with student-by-college observations, where college refers to the college to which a student applied (Figure 1). Students reported the schools they applied to and ordered them by preference. For example, student 1's top choice school was UCLA and their entire choice set also included UCSD, UCLA, and UC Irvine (Figure 1). The two-mode network data is then converted to a one-mode network data in order to show the relationship between colleges that students applied to.

A mixed method study will be used to evaluate community college students' choice sets. For the quantitative portion of this study, I used the igraph package in R to analyze the one mode network (Csardi & Nepusz, 2006).

Figure 1: Sample Student-College Data Listing

id	College
1	UCLA
1	UC San Diego
1	UC Davis
1	UC Irvine
2	Parsons
2	CSU Northridge
2	UC Berkeley
2	CSU SF
2	CSU Long Beach
2	UC Santa Barbara
2	SJSU
2	UCLA
2	FIT
2	UC San Diego

Qualitative Data Collection

For the qualitative portion of the study, I interviewed 31 participants across the two partner schools. To understand how students created their choice set, I conducted semi-structured interviewed (protocol is in Appendix 2). Interviews were conducted between April and July of 2020 to coincide with the UC system contacting students about their admittance status. While I had intended to interview students face-to-face, COVID-19 restrictions were put in place and I had to pivot to 30-60 minute Zoom interviews. I transcribed the interviews and uploaded the transcripts onto ATLAS.ti, a qualitative data analysis program.

I began to a two-stage coding scheme (Saldaña, 2015) to identify themes associated with how students searched for colleges during the college choice process. In the first stage coding scheme, I conducted Initial Coding where I read through the transcripts, broke down parts of the qualitative interview into discrete parts and constantly compared them to find emerging themes. (Saldaña, 2015). Then I utilized Process Coding (Corbin & Strauss, 2008) to understand how students are engaging in the college transfer process. Corbin and Strauss (2008) note that a process occurs when

an individual acts or experiences an emotion as they pursue a goal or address a problem. After coding each interview, I would write a memo to gather my thoughts and identify emerging themes (Corbin & Strauss, 2008). In the second stage of coding, the primary objective is to reorganize and reanalyze the codes from the initial stage and attempt to group them into categories, concepts or theoretical organizations (Saldaña, 2015). I conducted Axial Coding which seeks to regroup the codes into succinct categories. I ultimately achieve saturation when I exhausted as much information as I could from the codes (Saldaña, 2015). I also reviewed memos that I wrote during the initial stage of coding to help me to develop categories.

Descriptive Statistics

I report demographic information on the students who took the survey in Table 3. White and Asian students were the largest groups in my sample, and two thirds of my sample were women. When I evaluated father's educational attainment for my participants, the majority had attended some form of college and 24% and 18% of the survey respondents' fathers had earned a bachelor's or graduate degree, respectively. Likewise, when I evaluated mother's educational attainment for my participants, the majority had mothers that attended some college with 20% and 17% of mothers earning a bachelor's or graduate degree, respectively. Almost 75% of the participants attended full time while 57% received some form of financial aid. The vast majority of participants did not work; however, among the students who did work, there were some students (17) working more than 30 hours.

I also report student GPA to capture their academic achievements; the average student GPA was 3.57 with a range between 2.20 and 4.00. This is considerably higher than the 3.10 average GPA score from Eagan and Jaeger (2009) when they used a dataset composed of the population of all California community college students. Since I was interested in students who may qualify for the

TAG agree, I tried to recruit students with at least a 3.00 GPA but I did not restrict anyone from participation. My partner schools examined student transcripts and identified students who had at least a 3.00 GPA. This allowed me to oversample students who may have qualified for a TAG agreement.

Table 3: Descriptive Statistics of Survey Respondents

	Freq	Mean
Race		
African American	11	9.57
Asian	32	27.83
Latinx	20	17.39
White	36	31.30
Other	16	13.91
Gender		
Female	80	69.57
Male	34	29.57
Other	1	0.008
Father's Education		
Grade 9 or less	6	5.22
Some high school, did not graduate	9	7.83
High school graduate	26	22.61
Some college credit, no degree	20	17.39
Associates Degree	5	4.35
Bachelor's Degree	28	24.35
Graduate Degree	21	18.26
Mother's Education		
Grade 9 or less	10	8.7
Some high school, did not graduate	8	6.96
High school graduate	18	15.65
Some college credit, no degree	20	17.39
Associates Degree	16	13.91
Bachelor's Degree	23	20
Graduate Degree	20	17.39
Enrollment Intensity		
Part time	29	25.22
Full time	86	74.78
Financial Aid		
Bog Waiver/Promise Scholarship/Pell Grant	65	0.57

No Pell, BOG Waiver/Promise Scholarship	50	0.43
Employment Status		
0 hours	70	6.36
1-10 hours a week	15	1.36
11-20 hours a week	30	2.73
21-30 hours a week	19	1.73
31-40 hours a week	10	0.91
more than 40 hours a week	7	0.64
Academics		
GPA		3.57
N	115	

Results

Quantitative Section

Students shared their college choice sets, which I used to analyze their inherent preferences. In total, 115 students submitted 457 applications to 46 unique schools.

In Table 4, I report the top 20 unique schools that my participants applied to.[3] The most popular schools were UC Berkeley (71) and UC Davis (69) which are both in Northern California; this is not necessarily surprising because the two partner schools are situated in Northern California (they are the two UC schools closest to these community colleges). UCLA, UC San Diego and UC Santa Barbara were also part of the top five most applied to schools for these community college students. Since I had been trying to sample participants with at least a 3.00 GPA, it is possible that I was capturing students who were more interested in the more selective state public institutions. Many of the students are relatively high achieving students (>3.00 GPA)

and it appears they are willing to travel a good distance for their education. While prior literature notes that students are less likely to travel far to attend college (B. T. Long, 2004; Turley, 2009b), it appears that my sample of students are willing to at least consider high quality schools that are

[3] I dropped two institutions from the list: the University of Manila in the Philippines and McGill University in Canada because institutional characteristics are not available on them in IPEDS.

further away from their home. It is also possible that location has heterogenous effects on college choice and students with higher GPA scores are less sensitive to distance from their homes.

Other patterns emerged from examining students' college choice sets. The participants also showed some interest in the broader-access Cal State University system, particularly those closest to each respective community college. CSU San Francisco (27), CSU East Bay (24), and CSU Sacramento (21) were among the top ten most applied to institutions, also located in Northern California. There were only a few students who applied to private schools in California or out-of-state institutions. The most popular in-state private schools were Mills College (4), an all-women's liberal arts college in Oakland, California, University of San Francisco (4), a Jesuit college in San Francisco, and the University of Southern California (3) in Los Angeles.

Table 4

Institution	Count	Percent	Institution	Count	Percent
UC Berkeley	71	0.16	CSU SJ	11	0.02
UC Davis	69	0.15	UC Riverside	9	0.02
UCLA	46	0.10	CSU SD	9	0.02
UC San Diego	34	0.07	CSU Cal Poly SLO	6	0.01
UC Santa Barbara	29	0.06	CSU Sonoma	5	0.01
CSU SF	27	0.06	UC Merced	4	0.01
CSU East Bay	24	0.05	CSU Long Beach	4	0.01
UC Santa Cruz	23	0.05	Mills College (Oakland)	4	0.01
UC Irvine	23	0.05	U. of SF	4	0.01
CSU Sac	21	0.05	U. of Southern Cal	3	0.01

Since students provided me with all their college choice sets, I tried to understand which schools students co-applied to. To visualize the choice sets, I created a sociogram with the igraph package in R (Figure 2). The circles or nodes represents a unique school and the size of the node is a reflection of the number of applications that students submitted; so, for example, UC Berkeley (71) and UC Davis (69) are the largest nodes. The smaller nodes

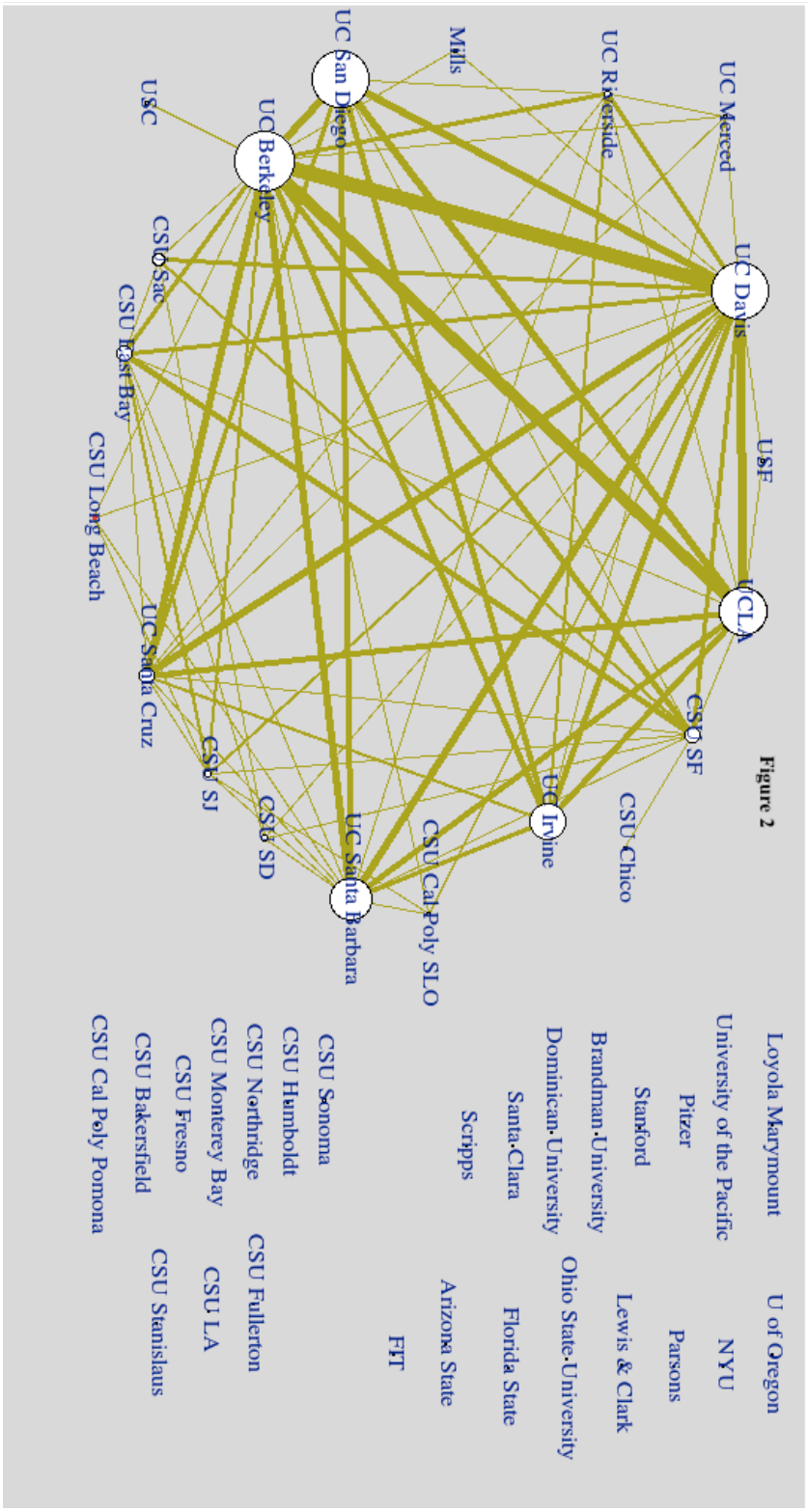

Figure 2

represent the institutions that fewer students applied to. As can be seen in Figure 2, the smaller nodes tend to be CSU campuses in Southern California, private in-state college, and out-of-state

institutions. It appears that students are more interested in applying to the more selective UC system campuses, and institutions located closer to their respective community college.[4]

Lines or edges between two nodes are present if at least four or more students co-applied to those two institutions. To help reduce visual clutter, I established a threshold of four to reduce the number of edges in the sociogram. Edges are weighted by the number of co-applications between two institutions and thicker edges represent large numbers of co-application while thinner edges indicate that fewer students co-applied to the two unique schools. Schools listed on the right side without edges represent institutions that students applied to but had less than four co-applications and thus edges were deleted. These institutions were primarily out-of-state schools, in-state private schools, and CSUs outside Northern California.

I examined the edges coming out of the UC Berkeley node and use this institution as an example to illustrate student application patterns. UC Berkeley is an ideal case study to analyze student application patterns because it is the oldest campus within the UC system and along with UCLA, it is considered the most prestigious institution in the system. For my participants, those who applied to UC Berkeley had some distinct application patterns. Students who applied to UC Berkeley were more likely to also apply to UC Davis and UCLA. In general, they were also more likely to apply to other UC campuses with somewhat thick edges connecting to UC San Diego, UC Santa Barbara, and UC Irvine. At the same time, students who applied to UC Berkeley are less interested in applying to campuses in the CSU system and there are relative thinner edges or they are nonexistent with a couple of notable exceptions. Students who applied to UC Berkeley are also applying to CSU SF and CSU East Bay. Since UC Berkeley, CSU SF, and CSU East Bay are all in

[4] Ideally, I would be able to report on the distance between a student's community college and the four-year college that they applied to but due to confidentiality reasons, I am abstaining from providing this information.

the San Francisco Bay Area, it appears that students are interested in applying to schools in the same locale.

It is worth mentioning that there were very few private in-state colleges, or out-of-state institutions connected to UC Berkeley. The sociogram shows that there was some interest in Mills College and USC and these students would have seriously merited admission to other in-state private colleges or out-of-state institutions, but they did not even apply.

Qualitative Results

While the sociogram shows which colleges students applied to, they do not reveal any information about why. Hence, I interviewed students to understand what drew their interest to particular four-year institutions. I conducted interviews with 31 participants, and I report on the results in the next section. At the end of the demographic and college choice survey, students were asked to volunteer for a 30-60 minute interview. This was the primary recruitment tool, and all students who indicated their willingness to be interviewed were contacted via Zoom.

An interview protocol (Appendix 2) was used to ask students about the college choice process and to describe why they chose to apply to the schools in their choice sets. The interview protocol was developed using extant literature on community college transfer and college choice to explore how student navigated the transfer process. The interview protocol also elicited information about how students searched for four-year colleges to transfer and the reasons why they applied to a particular institution. Since I had the sociogram in mind as I was developing the interview protocol, I also asked students where they considered applying to but ultimately did not apply, and what institutional factors influenced their college choice decisions. Below I report on several key concepts from the 31 interviews that may provide insight to the sociogram and students' college choices.

Below is a chart providing some background information about the 31 participants (Table 5). All individuals are assigned pseudonyms to preserve their privacy.

Table 5: Summary Statistics on Interview Sample

ID	Pseudonym	Race	Gender	Major	Employed	Received Fin. Aid	# of Schools Applied
1	Jillian	Latinx	Female	Social Justice	Yes	Yes	2
2	Larry	White	Male	Undecided	Yes	No	2
3	Rick	White	Male	Mathematics	Yes	No	2
4	Marge	Latinx	Female	Biochemistry	Yes	No	2
5	Sue	Latinx	Female	Nursing	Yes	Yes	1
6	Stephanie	White	Female	Communication	No	No	3
7	Diana	Latinx	Female	Communications	Yes	Yes	10
8	Melanie	White	Female	Biology	Yes	No	6
9	Brian	AA	Male	Statistics	No	Yes	8
10	Alvin	Latinx	Male	Business Administration	Yes	No	3
11	Monica	Asian	Female	Psychology	Yes	Yes	6
12	Hilary	White	Female	English	Yes	No	6
13	Terry	White	Other	Sociology	Yes	No	7
14	Sara	AA	Female	Biology and Anthropology	Yes	Yes	3
15	Jerry	Asian	Male	Biology	Yes	Yes	2
16	Greg	Other	Male	Associates of Transfer	Yes	No	1
17	Oliver	AA	Male	Political Science	Yes	Yes	9
18	Alexandra	Latinx	Female	Anthropology	Yes	No	3
19	Judy	American	Female	Political Science	Yes	Yes	6
20	Joanna	Asian	Female	Cognitive Science	Yes	No	4
21	Darla	Asian	Female	Computer Science	Yes	No	3
22	Raquel	Other	Female	Art History	Yes	Yes	3
23	Mark	AA	Male	Studies	Yes	Yes	4
24	Jay	White	Male	English	Yes	No	2
25	Zoe	Other	Female	Biology	Yes	No	4
26	Charles	Asian	Male	Electrical Engineering	No	Yes	4
27	Patricia	Asian	Female	Political Science	Yes	Yes	4
28	Carrie	White	Female	Biotechnology	Yes	No	3
29	Nicole	Asian	Female	English	Yes	No	4
30	Fiona	White	Female	English	Yes	No	7
31	Esther	White	Female	Cognitive Science	No	No	5

Prestige Seeking

Students were asked to identify the schools that they applied to transfer to and to explain their reasoning behind their decisions. Students were anxious about getting admitted into their preferred schools and expressed a desire to gain admission to the two most prestigious institutions in the UC system, UC Berkeley and UCLA. Prestige was a driving force behind students' college choices and very few students expressed interest in attending the broader access CSU system. Jay identifies as a white transgender male and was interested in studying creative writing, but he was interested in attending UC Berkeley because

> "it's just a pretty prestigious school to my understanding, you know, and there's a lot of competition there to get in. So, like obviously they have something good going on, you know, and it's, I know it's one of the, it's probably like one of the top state schools in the country for like various sciences or whatever. And I'm not sure if that's exactly it for creative writing, but it's just one of those names that I get the impression, catches people's eye."

Other students believed that attending a prestigious school would offer them an advantage in the job market. Oliver is an African American student who had attended a trade school directly after high school and was delivering food for an app company. He came back to school when he was passed over for a promotion because he did not have a bachelor's degree. He believed that employers would be more impressed by job candidates who had a degree from a prestigious school. He states:

> "UCLA and Cal [are] always the ones that like [it]doesn't matter what you studied there…You know, they'll get you into a job interview without [employers] even trying to get to know you like they didn't really do their homework. They just saw the name of the school and brought you in. Is it bias? I don't know. I'm like dude, is there

institutional bias? So, I've just felt like dude, don't try to fight the game. It is what it is. If you have the ability to play, well UCLA and Cal are your plays, your bets."

Articulation Agreements

As community college students were preparing to transfer and identify four-year colleges to apply to, articulation agreements played a major role in their college transfer choices. While the transparency allows students greater understanding of the admissions policies for many colleges in the state, students who were interested in multiple institutions were faced with different requirements. Melanie is a white student and would seek support from her parents who had attended college. She was interested in hybrid majors such biochemistry and faced a dilemma when selecting institutions to apply to. She had taken a fair number of classes and she tried to find schools that would accept them. Melanie explains how her classes were not the same for every school:

> "And so, then I had to look at all the schools and I was just kind of looking at anything within my future career options like within Bio, within Chemistry. And so that's when I was panicking kind of because like for some schools, I didn't have like a certain class that you needed to transfer for that major. And I'm like, well, I have to get in. If I don't have this class [to meet the admission requirement], I was nervous about it because I didn't want to overload myself anymore [because] I already was overloaded."

While these articulation agreements are available online, some students found the information confusing which affected their decision about where to apply. Not only does each unique community college have a distinctive articulation agreement with a particular four-year college in the state, but course requirements also vary by students' majors. Thus, a student who is

interested in attending cognitive science at UC Berkeley may have to take different courses to fulfill requirements for that major at UC Davis. While some students had competitive GPA scores, they were unaware that course requirements were different across campuses and they didn't meet the minimum eligibility requirements. For example, Alvin is a Latinx male, and he was interested in pursuing a business economic major at UCLA. He had a 4.00 GPA, but he did not take the appropriate math course and he was unable to meet UCLA's requirements. Alvin said,

> "I know I couldn't apply to UCLA because my counselor suggested you know business calculus rather [than] regular calculus, but UCLA only accepted regular calculus and, you know, I should have done my due diligence on that but you know I trusted the counselor and that ended up hurting me."

Alvin developed an interest in UCLA while researching for schools to apply, and his honest omission of regular calculus in favor of business calculus proved costly. There was no time to make up the math class and he did not apply to UCLA.

Prestige seeking and bounded rationality

For the students who indicated that they were interested in attending a prestigious university, I inquired about whether they also considered applying to high status private schools. Bounded rationality theory is helpful to understand student behavior as many students struggled to access pertinent information to make informed decisions. Students who showed interest in attending a prestigious public school such as UC Berkeley and UCLA said they also considered applying to elite private schools such as Stanford University, New York University, University of Chicago, and Columbia University. While some of the participants with 4.00 GPA scores said they were interested in these prestigious institutions, lack of information hindered their choices. Some students

incorrectly believed it was not possible to transfer from a community college to a selective private college because they assumed that these institutions only catered to high school seniors. Other students said that they did not know what course requirements they had to meet to transfer to these selective private colleges. Unlike the UC system, some selective universities such as Stanford University refuse to establish articulation agreements with community colleges in the state. Students also reluctant to apply to selective college because they did not know if the community college course units that they earned would transfer over to the four-year college.

Students expressed interest in colleges beyond the state's two public university system but they found it difficult to access information about alternative options. Students sought help by scheduling meeting with their campus counselors, but felt that that they were steered towards the UC and CSU system. Alex is a Latinx student and was interested in attending the University of Southern California. Alex was stymied in his attempt to get information as he recalled seeing,

> "multiple counselors, because I want to try different ones and pretty much every single one when I told them that want to go to USC…[they] do not have that much experience with experience with private schools and they didn't know how USC work."

Alex did not give up his search for information about USC and went on Youtube to scope out the university and talked to a peer who had similar ambitions. Through these channels, Alex found out that USC had invested resources to develop articulation agreements with each California community college. Alex recalibrated his course taking to meet USC's requirement and eventually submitted an application.

Expecting students to undergo this search for information about private schools can limit students' options. While Alex was able to come across information to apply to a private college, his experience was not shared by all his peers who were left to search for information about private

schools by themselves. There was so little information available about private schools that students were operating with inaccurate information. For example, Brian is a first generation, African American student pursing a degree as a statistic major. He had a 3.55 GPA and said that he was interested in transferring to USC but he thought it was impossible to get in. He says attending USC was,

> "like a dream even though I shouldn't think of it that way, [but] it seemed out of reach. Looking back on it if I had taken it seriously. I feel like I could. I should of applied. I didn't apply because I didn't think it is because it is so much a dream to me. … Most private schools didn't come to the community colleges. The UCs and the CSUs [representatives] are always at [our] school. They're always sent representatives and things like that. And also, I feel like, most community colleges, they prioritize getting kids into state schools and they have so much information about the UCs. For the privates, you have [to] go on your own and figure it out."

Brian wished USC had made the transfer requirement information more accessible to community college students. However, he was surprised when I told him that USC had established articulation agreements with all the community colleges in California. He wondered why his community college did not provide more information about attending USC or other private schools.

Some students also said that they were reluctant to fill out separate applications to the private schools while simultaneously trying to complete their transfer requirement at their community college. Students conducted satisficing behaviors (Simon, 1965) and elected to find an available and satisfactory alternative within the state's public university system; rather than apply to private schools, students concluded that UC Berkeley and UCLA were suitable prestigious alternatives within the state's public education system. Students said that they were so tired from completing the

UC applications that they could not justify allocating their time to meeting the requirements to applying to a private college. When I asked students what these requirements consisted of, they said they would have to fill out forms from the Common Application which would mean that they needed to revise the personal statements from the UC application so that it answered the prompts from the private schools. Other students said they would have to retake the SATs to meet the private schools' admission requirements, but they did not have time or the energy to complete these obligations.

When seeking out prestigious colleges, private schools were often eliminated because students had limited information which made it difficult to assess the prospects of admission. I use a detailed example of Sara to illustrate how access to information helped and hindered her college choices. Sara is an African American woman, a first-generation college student and earned a 4.00 GPA in Integrative Biology at her community college. Sara had been placed into a vocational track in high school and enrolled in a community college to prove that she could succeed in college. Coming from a single parent family, Sara had limited support from mother who had never attended college and was employed as a parking lot attendant at UC Berkeley. However, Sara's mom struck up conversations with a UC Berkeley professor who was trying to park his car. The professor relayed to Sara's mom information about the dedicated transfer outreach programs offered at UC Berkeley for current community college students, including admission representatives who would look over a student's transcript to ensure that requirements were met and provide feedback on personal statements. As a result, Sara participated in this transfer program and felt prepared to apply to UC Berkeley, UCLA, and UC Davis. To further understand Sara's search process, I asked her if she had interest in applying to private colleges. She said she was interested in attending Stanford because it was a prestigious university in Northern California, but it would have been too much of a financial burden on her mother. However, Sara was not aware that Stanford waives tuition, fees and

room and board for students who come from households that make less than $65,000. Moreover, she was reluctant to take the SAT because it was time consuming since she was still taking a full course load. When I asked her if she ultimately had applied to Stanford, she said,

> "I didn't apply because I thought it was a long shot. I mean, it's like really hard to get in for anybody like you can be, you know, so like I didn't think I had that much of a chance."

Sara possessed a high GPA score in a STEM major and she had a supportive mother who extended some social capital to access invaluable resources. However, there was not an institutional actor or bridge program between her community college and Stanford University, and she ultimately decided not to invest more time to research this option.

The Role of Location

Students cited distances as a major concern and influenced where they were willing to apply to. To illustrate, Table 6 shows the participants interviewed and the location of the institutions that they applied to. Of the 31 students interviewed, only one student applied to a college out of California while everyone else was focused on attending institutions within the state. The one student who applied to out of state colleges was willing to move to the New England area but the rest of the students wanted to stay in Northern California. There 27 students who applied to at least one college that was within 30 miles of their community college. Many of the students were interested in attending pursuing a bachelor's degree while also living at home. While most students did not apply to out of state colleges, they did apply to institutions in Southern California, which are over 300 miles away. Table 6 also shows the variance in each students' choice set and the average distance among the institutions, respectively. If we examine a students' choice set, the average

distance of the institutions that students applied to falls below 300 miles. This suggests that students are primarily applying to schools in the Northern California region.

Table 6:

	Pseudonym	# of Apps.	Applied Out of State	Nearest College Applied to is <=30 miles	Furthest College Applied to	Average Distance of College Applied to
1	Alvin	3	No	Yes	346.72	207.13
2	Alexandra	3	No	No	446.13	257.97
3	Brian	8	No	Yes	457.67	145.46
4	Carrie	3	No	Yes	18.72	11.54
5	Charles	4	No	Yes	446.13	209.77
6	Diana	10	Yes	Yes	2562.29	720.82
7	Esther	5	No	Yes	446.13	180.2
8	Fiona	7	No	Yes	66.23	287.52
9	Hilary	6	No	Yes	446.13	241.66
10	Jay	2	No	Yes	15.27	7.95
11	Judy	6	No	Yes	446.13	195.83
12	Jillian	2	No	No	63.51	53.79
13	Joana	4	No	Yes	446.13	140.61
14	Jerry	2	No	Yes	53.76	27.2
15	Larry	2	No	Yes	292.43	160.52
16	Marge	2	No	Yes	44.06	36.34
17	Melanie	6	No	Yes	385.84	210.56
18	Monica	6	No	Yes	61.91	32.15
19	Mark	4	No	Yes	338.54	166.74
20	Nicole	4	No	Yes	338.54	157.98
21	Oliver	9	No	Yes	446.13	227.9
22	Patricia	4	No	Yes	446.13	209.77
23	Raquel	3	No	Yes	338.54	130.98
24	Rick	2	No	Yes	28.61	27.39
25	Sue	1	No	No	30.85	30.85
26	Stephanie	3	No	Yes	260.1	110.92
27	Terry	7	No	Yes	446.13	222.59
28	Zoe	4	No	Yes	383.14	244.51
29	Darla	3	No	Yes	346.72	181.83
30	Greg	1	No	No	53.76	53.76
31	Sara	3	No	Yes	338.54	130.98

Since all the students were attending community colleges in Northern California, location had a nuanced influence on college choice sets. First generation college students and children of immigrants were apt to stay closer to home and apply to institutions in Northern California. For example, a Vietnamese American student name Darla and Thai American student named Patricia each had parents who owned a family restaurant. They both juggled their studies while helping at their family restaurants. While Darla said her dream school was USC, she said would attend UC Berkeley because it was closer to home. Likewise, Patricia, was admitted to UCLA but would attend UC Berkeley if she was accepted to help her parents with the restaurant especially because they do not speak English.

Students whose parents had earned at least a bachelor's degree expressed some desires to create distance from their households. In particular, multiple students described a desire to move away from Northern California and enroll in a college in Southern California. They were interested in campuses in Southern California because it was far enough from their parents and they wanted to develop independently from them; yet, be close enough to drive back home for the holidays. These students were also intrigued by the opportunity to live on their own and mature as students and as adults.

Discussion

This study sought to understand the college choice process for community college transfer students. While students may be successful academically at their respective community college, the transfer process is opaque and often students are left on their own to navigate. While students may prefer prestigious colleges as transfer destinations, they may not be aware of all their options. My findings are important because they bring to light the constraints that community college students face

when they try to transfer. Articulation agreements are meant to increase transparency for students interested in transferring (Roksa & Keith, 2008) but they may unwittingly lead students to primarily consider a narrower group of institutions. Moreover, the absence of articulation agreements between selective four-year colleges and community colleges may hinder student choices and lead students to overlook all their options.

Another issue that was raised by students was the need to submit SAT scores with their applications. Requiring community college students to submit SAT scores raises validity concerns since the SAT is meant to evaluate college readiness for high school students. Community college students are college students who have taken college level courses that are accepted at the UCs. While beyond the scope of this paper, future work could interview private college admission representatives to understand the rationale to require community college students to submit SAT scores.

Though policies have been implemented with good intentions to ensure that the community college system helps students transfer to acquire a bachelor's degree, it is important to craft policies to address student needs in a holistic manner. Community colleges provide open, affordable, and convenient access for many students in pursuit of a bachelor's degree (N. Hillman & Weichman, 2016). Continued investment in resources and careful policy implementations can increase student success rates and improve bachelor's degree attainment.

State and federal policies that seek to advance community colleges and their transfer should be crafted in ways that considers the priorities and constraints that community college students face. In my research, I find that my sample of high performing students are aware of the stratification within higher education and they are interested in attending selective institutions. I also find that students follow a set course taking pattern defined by articulation agreements developed by the community college system and the state's public institutions. These articulation agreements

simultaneously make transparent the minimum requirements to transfer but the different standards set by participating institutions invariably creates confusion for students. Thus, students who can rely on institutional agents are more aware of their options. As a result, students' options are constrained by the type of information students have access to. While my research shows that students are interested in selective colleges, they do not want to move too far away from where they attended a community college. Mandates could be introduced to force selective colleges to accept more high performing community college students but even then, higher education institutions will face enrollment capacity constraints. The application patterns of my community college students are indicative of the complexity of the transfer process and the many factors that influences where my participants want to earn a bachelor's degree. While state and federal policies may not be able to address all the concerns found in my research, there is room for better education policies to help students transfer to a four-year college.

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Appendix 1: College Transfer Choice Survey

A. Which schools did you apply to? Please rank the schools that you applied to based on how much you wanted to attend that school.

Colleges that you applied to

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.

B. How confident are you that you will get accepted to each of schools that you applied to?

Colleges that you applied to	0-100%
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	

C. Did you apply for a Transfer Admission Guarantee (TAG) agreement? Which UC were you trying to transfer to?

D. Are you currently pursuing an Associate's Degree of Transfer (ADT)? Which CSU were you trying to transfer to?

E. Were there any schools that you were interested in and did not apply to? Which ones?

Student Demographics

F. How would you describe your ethnic background?
   a. African American
   b. Asian
   c. Latinx
   d. White
   e. Other:_____

G. What is your gender identification? Please Circle.
   a. Female
   b. Male
   c. Non-binary

H. Please indicate your parent/guardian highest education levels by placing a check in the appropriate box. If you only have one parent, use the "Parent 1" column only. Please check the appropriate box (one per column).

	Parent 1	Parent 2
grade 9 or less		
some high school, did not graduate		
high school graduate (diploma, GED, or equivalent)		
some college credit, no degree		
Associate's degree (for example: AA, AS)		
Bachelor's degree (for example: BA, BS)		
Grad. degree (Master's, Ph.D., or professional degree beyond BA)		

I. When did you first attend this community college?

J. How old are you?

K. What is your current GPA?

L. What is your major?

M. Have you ever received a Promise Scholarship?
N. Have you ever received a Pell Grant?
O. Have you ever received any other scholarship?

P. In the semesters that you were enrolled in classes, was it mostly:
    a. on a full time basis (>12 units a semester)
    b. on a part time basis (<12 units a semester)?

Q. Do you currently have a job?
R. How many hours do you work a week?

S. If you are willing to participate in a voluntary follow-up interview, please click on the link below. It will lead you to a separate page where you can leave your name and contact. You will be compensated for your time. This page will be unconnected to the survey and thus, your answers and identity will not matched.

Appendix 2

Interview Protocol Form

Institutions: _____
Interviewee (Title and Name): _____
Interviewer:_____

Other Topics Discussed:

Documents Obtained:

Introductory Protocol

My name is _____ and I will be conducting this interview with you. To facilitate our note-taking, we would like to audio tape our conversations today. Please sign the release form. For your information, only researchers on the project will be privy to the tapes which will be eventually destroyed after they are transcribed. In addition, you must sign a form devised to meet our human subject requirements. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) we do not intend to inflict any harm. Thank you for your agreeing to participate.

We have planned this interview to last no longer than 60 minutes. During this time, we have several questions that we would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.

You have been selected to speak with us today because you have been identified as someone who has a great deal to share about transferring to a four-year college. Our research project as a whole focuses on factors that influence community college students and their decisions once they decide to leave this institution. We are interested in how you made your postsecondary decisions.

If there are no further questions, let's get started with the first question.
[Note: the researcher will use phrases such as "Tell me more", "Could you give me an example?", "Could you explain that?" as prompts to solicit more detailed information when needed.]

1. To get started, let's introduce ourselves. In your introduction please tell us who you are, the community where you currently live as well?

2. Why did you decide to enroll in a community college?
   Probe: What were your options after graduating high school?

3. Describe what attracted you to this community college?
   Probe: Why are these factors so attractive? What makes them so important to your success as a student?

4. Please describe your transfer decision.
   a. Probe: If students says they are transferring, proceed to Question 5. If they say they, do not plan to transfer, ask them why.

5. As a student with intentions to transfer, how much support did you receive from this community college? Please describe several ways this community college could have helped you along the transfer admission process.

6. As you were going through the transfer admission process, what challenges did you face?
   Probe: How did you address these challenges?

7. Consider the colleges you applied to transfer to. Why were you interested in these colleges?
   Probe: How do you eliminate colleges from your list?

8. How did you acquire information to make informed decisions about transferring?

9. Which school did you elect to transfer to? Please explain why.

10. What additional support could you use to help you decide where to transfer to?