Factors Associated with Enrollment Choices of Students Admitted to a Public Research University and Differences in the Resulting Outcomes

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ABSTRACT

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This study examines college choice decisions of students admitted to the University of California (UC) and the relationship between these choices and degree attainment. It does so using a dataset that combines UC administrative data with National Student Clearinghouse data on enrollment and degree attainment. It first discusses how academic and socioeconomic background characteristics are associated with initial enrollment choice following freshman admission. It then looks at how this choice is associated with attainment of a bachelor's degree within four and six years, controlling for a rich set of background characteristics.

Given policy discussions, this study is particularly interested in the viability of the California Community College to 4-year institution transfer pathway as a route to a bachelor's degree. A novel feature of this study is the use of application and admission to a selective 4-year institution (the University of California, UC) as signals of transfer intent and readiness.

By exploring the enrollment choices and outcomes of UC applicants, this study offers relevance to policymakers allocating resources, to students deciding where to attend college, and to institutions. The state can direct funds either to enrollment in 4-year institutions from high school or to increase support for the transfer pathway. These choices can be shaped both by an examination of priorities in access (which students end up in which pathways), and/or of efficiency (which pathway has better outcomes). For students, a better understanding of possible outcomes may help in the college choice process. For institutions, understanding factors around student success can help to highlight inequities in outcomes and to direct resources toward those issues.

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CHAPTER ONE

INTRODUCTION

Overview

The choice of where to attend college is a consequential one, especially for low- and middle-income students for whom college is a significant driver of social mobility, yet who also tend to attend less-selective colleges than their similarly scoring but higher income peers (Chetty et al., 2020). Given the stakes, more research is needed into the things that characterize college choice. This study will explore how background factors are associated with the type of institution a student admitted to the University of California decides to attend. It will also explore how this choice is associated with bachelor degree completion rates by the type of institution.

Given current policy discussions, this study is particularly interested in the viability of the California Community College to 4-year institution transfer pathway as a route to a bachelor's degree. A novel feature of this study will be the use of application and admission to a selective 4-year institution (the University of California) as signals of transfer intent and readiness. Confounding factors in ascertaining the impact of 2-year vs 4-year pathways are the identification of transfer readiness (preparation) and transfer intent. For example, Sandy, Gonzalez and Hilmer (2006) argue that lower bachelor's completion rates among community college entrants are due to lower rates of individual preparation, rather than community college quality. Identifying intent to transfer also complicates research. Many community college attendees do not plan to transfer, diluting the success rates of those who do. UC admission, while not perfect, serves as a proxy for having a solid academic foundation and desire to complete a bachelor's degree. This will allow the comparison of graduation rates between of students who

are admitted to UC but choose not to attend with their peers who are admitted and matriculate at UC.

Research Questions

A little less than half of California public high school students admitted to UC as freshmen choose not to attend. Descriptively, what are the differences, at both individual and institutional/geographical levels, between students admitted to UC who choose to attend compared to those who are admitted but choose to attend elsewhere? In particular, given the interest around transfer pathways and the debate about community college efficacy, what factors are associated with choosing to attend a CCC?

Secondly, how is a student's initial enrollment choice associated with their chances of completing a bachelor's degree? How does this change when building a model that controls for observed differences in socioeconomic background and academic preparation?

Policy relevance

By exploring the enrollment choices and outcomes of UC applicants, this study offers relevance to policymakers allocating resources, to students deciding where to attend college, and to institutions. The state can direct funds either to prioritize enrollment in 4-year institutions directly from high school or to increase support for the transfer pathway. It can also decide to direct institutional financing toward public institutions or to grant financial aid to students attending private institutions. These choices can be shaped both by an examination of priorities in access (which students end up in which pathways), and/or of efficiency (which pathway has better outcomes). For students, a better understanding of possible outcomes may help in the college choice process. For institutions, understanding factors around student success can help to highlight inequities in outcomes and to direct resources toward those issues.

This study intends to provide additional understanding around the individual, institutional and societal factors that shape college choice and by extension college outcomes, particularly when it comes to the transfer pathway. In doing so, it will engage in the policy conversation about how to create opportunities for more students to obtain college degrees and how to ensure those degrees are worthwhile. In the pessimistic view of Brint and Karabel (1989), "As long as American society generates more ambition than its economic structure can absorb, the community college will be actively involved in channeling the aspiration of students away from four-year colleges and universities." This study hopes to contribute to transparency around who is experiencing this channeling, and to illuminate what gaps exist between aspirations and realities.

While most prior studies have relied on national-level sample data, this study will focus on a full population dataset of administrative data from the University of California. In 2017, the proposed state budget withheld funds from UC unless it could implement reforms to increase transfer enrollment (Jackson, 2017). The budget also allocated $150 million for implementation of transfer pathways (Gordon, 2017). In 2019, the state implemented a new funding formula for community colleges that included financial incentives for successful transfer outcomes (California Community Colleges Chancellor's Office, n.d.). Given California's emphasis on funding and incentivizing transfer, this study's focus can help guide policy.

Policy Tradeoffs and Considerations in the Transfer Pathway

To set this research in context, it is helpful to explore the history and the arguments for and against the transfer pathway as an efficient and equitable route toward a bachelor's degree. Originally designed to increase access and remove the burden of general/preparatory education from 4-year colleges, community college enrollment ballooned after World War II, the Korean

War, and the Vietnam War (Kane & Rouse, 1999). While the transfer mission is one of the key roles of a community college, the growing popularity of vocational programs has led to reckoning about whether this mission is at risk (Townsend & Wilson, 2006). The "class-reproduction school of community college scholarship" criticizes community colleges for reproducing existing structures by perpetuating a tiered system (K. Dougherty, 1987). This argument holds that community colleges reinforce a tracking system, channeling first-generation and less privileged students toward vocational programs, fueling the aforementioned growth. Rouse (1995) framed the debate as one of democratization versus diversion: community colleges both increase access while potentially attracting students away from a better-resourced 4-year college with higher potential for success. Others, in contrast, highlight the open-access community college as providing a "second chance" for the many students, particularly disadvantaged ones, who leave high school unprepared for college (Goldrick-Rab, 2010). This debate led Doughtery (1994) to call the institution the "Contradictory College", torn from its original academic mission.

From an access perspective, the transfer pathway could either help by giving students additional opportunities, or it could divert students from the goal of a bachelor's degree. The *Master Plan* noted that junior colleges can provide "A proving ground for those who have not made records in high school good enough to justify direct entry into senior college" (*A Master Plan for Higher Education in California, 1960-1975*, 1960). The evidence is mixed on the overall impact of community college on degree attainment. Rouse (1995) found that community colleges allow students who would not have attended college to obtain an education. On the other hand, building on Clark's (1960) seminal description of junior colleges as serving a "cooling out" function for channeling students away from 4-year colleges and white-collar

occupations, Brint and Karabel (1989) argued that community colleges, with their poor attainment rates, hinder students that might have succeeded. The answer is likely that both are true. Brand et al. (2014) call attention to the heterogeneity of the student population and find, perhaps unsurprisingly, that community college moderately helps students who might have not attended any college at all, but penalizes students who might have instead attended a selective college.

From a cost perspective, a bachelor's degree begun at a community college is often thought to be more cost-effective for both the student and the state, though this may not be the case in practice. While community college tuition is lower than other public options (Ma et al., 2015), in California at least, the high cost of living and financial aid availability mean that UC and CSU are usually cheaper options for the lowest-income students (*What College Costs for Low-Income Californians*, 2020). While community college students have lower direct costs and incur less debt on average, the tradeoff may be a lower chance of a baccalaureate degree and longer time spent getting to that degree (Hu et al., 2018). A simple analysis indicates the annual state subsidy per student is less at a 2-year institution, and tuition and fees are lower (Johnson, 2010). This is contradicted, however, by research using more sophisticated economic cost modeling. A study undertaken in 1978 found that, largely due to much larger class sizes and cheaper support staff such as graduate assistants, universities were actually able to provide undergraduate teaching less expensively (James, 1978). Another study found no major differences in the cost inputs between community college students and their equivalent lower-division students at 4-year public institutions (Breneman & Nelson, 2010). Focusing on public master's level colleges as the most likely target of diversion to/from community colleges, a study using large-scale federal data found that both the cost per FTE and the public subsidy per FTE

were lower at public master's level colleges than at community colleges (Romano & Djajalaksana, 2011). These studies would acknowledge that community college students are actually receiving larger state and local subsidies, since their tuition rates are far lower. Additionally, since the odds of transferring to a 4-year institution and completing a bachelor's are low and students often take far longer than the normative two years, a simple comparison of tuition and cost of instruction may be incomplete for thinking about long-term economic wellbeing (Gándara, et al., 2012). The National Student Clearinghouse has found that only about 13 percent of students entering community college earn a bachelor's degree within 6 years (Shapiro et al., 2017). In economic terms, there are many inefficiencies along community college pathways, such as excess or surplus units and high dropout rates (Belfield et al., 2014).

California Higher Education History

This research is focused on California public high school UC admits, most of whom end up somewhere in the California's higher education system. This section aims to provide the historical context for California's unique higher education landscape. The public component consists of three segments: the University of California (UC), California State University (CSU), and California Community Colleges (CCC). Combined with about 150 private non-profit institutions and 160 for-profit institutions, a total of nearly three million degree-seeking students are enrolled in California postsecondary institutions each year (Johnson & Mejia, 2019).

As the UC was growing during the Progressive Era, California was instituting major reforms that led to the growth of the nation's "first coherent system of mass higher education" (Douglass, 2010). Though it was not the home of the first community college, California was the first state to authorize local junior colleges in 1907, with later legislation in 1917 providing state support and in 1921 providing for local, independent community college districts (Vaughan,

1982). Also in 1921, the state centralized its seven normal schools into teaching colleges under the Board of Education, made teacher training a full four-year program, and discussed growing them into liberal arts colleges (Douglass, 2010). These teaching colleges became state colleges in 1935, continued to grow in number, and became the California State Colleges with the Donahoe Higher Education Act of 1961, which followed the recommendations of the 1960 *Master Plan for Higher Education in California* (*History | CSU*, n.d.).

The Master Plan and Current California Landscape

The Master Plan codified roles in the tripartite systems of the California Community Colleges (CCC), California State University (CSU), and the University of California (UC). The Plan originated as a compromise forged in the period of growth and ambition following World War II. The state colleges had long been wanting to expand into research and graduate training, while lawmakers were advocating for new colleges in their district without considering statewide needs (Douglass, 2010). Then UC President Clark Kerr, architect of the Master Plan, worried about dilution of resources and wanted to protect UC's monopoly, reflecting "We did not want to watch the state colleges abandon their highly important skill training functions for teachers in the hot pursuit of the holy grail of elite research status" (Kerr, 2001, p. 178). Meanwhile, with projected post-war enrollments ballooning and the state's coffers shrinking, the Master Plan offered significant cost savings by "Quickly shifting over 50,000 prospective university and state college students into the junior colleges…by lowering the eligibility pool" (Douglass, 2010). It also limited CSU to offering up to Master's degrees and CCC's to Associate's degrees, leaving professional and doctoral education to UC.

The Master Plan dictates the transfer pathway as a critical means of access and opportunity. CSU and UC were instructed to reduce their lower-division enrollments, which

could be handled by the CCC, in order to direct resources toward enrolling upper-division transfer students. The *Master Plan* used both cost and access justifications for its emphasis on transfer (Marginson, 2018). By directing students, and thus institutional growth, toward two-year colleges instead of research universities (e.g., UC) or teacher's colleges (CSU), money could be saved. By institutionalizing the idea of universal access and instituting enrollment guarantees to all qualified students, it aimed to maintain and even grow California's lead in higher education (Marginson, 2018). Geiser and Atkinson argue that aside from the political turf-war bargaining of the Master Plan around research and advanced degrees, cost savings were a greater concern than access in achieving support for the Master Plan, and the limits on access placed on UC (to the top 12.5%) and to CSU (the top 33%) were indicative of this (Geiser & Atkinson, 2013). Since community colleges are locally funded, this reduced the burden on the state.

The long-term implications of the Master Plan, which served to limit growth at CSU and UC, are that California ranks first among the states in the number of community colleges (*Digest of Education Statistics*, 2020, Table 317.20), and first in the nation in the share of its public higher education enrollments in 2-year (as opposed to 4-year) institutions "by a wide margin", at 74% (Geiser & Atkinson, 2013). CCC undergraduate enrollment has grown far more than CSU or UC over the last 50 years, and California now trails most other states in 4-year degree attainment, with the college graduation rate actually higher for older adults than for younger adults (Geiser & Atkinson, 2013).

Only four percent of California public high school students who enroll in college attend a private in-state college, and eleven percent enroll outside of the state (Kurlaender et al., 2018). The lack of growth, combined with funding cuts, across all sectors over the past two decades has led to growth in the for-profit sector (Douglass, 2010b). Though in 2010, a California

Postsecondary Education Commission Report predicted and expected growth from California's accredited non-profit private colleges to help meet overall demand (Wilson et al., 2010); however, these institutions also face rising costs and the desire to remain small to promote exclusivity and cachet.

The Transfer Pathway in California

The transfer pathway to a bachelor's degree, where students enroll in a community college out of high school for their lower-division courses and transfer to a 4-year institution for their upper-division requirements, is a key component of California's public higher education system. In fact, the Associate's degree was conceived and pioneered at UC Berkeley, which also restructured its curriculum at the time into upper and lower division to help facilitate transfer (Douglass, 2010). The California legislature has adopted statutes that give CCC transfer students admission priority over new freshman or sophomores and that require UC and CSU to maintain a target of upper division enrollment in order to provide transfer access (Taylor, 2011).

In 2010, Senate Bill 1440 mandated CCCs to create two-year degrees known as Associate Degrees to Transfer (ADT) that were "fully transferable" to CSU, with automatic eligibility to transfer (Taylor, 2012). Companion legislation also requested, but did not mandate due to UC's constitutional autonomy, that UC create similar pathways, and further legislation in 2013 provided for additional implementation guidelines and resources (Reddy & Ryan, 2021). The ADT program has been shown to increase degrees awarded and promote transfer (Baker, 2016), while also reducing time-to-baccalaureate and unit accumulation (Baker et al., 2021). In July 2021, California enacted AB-132, directing the creation of a dual admissions program that would guarantee CSU or UC admission to a specific campus for CCC freshmen that meet certain

requirements (AB-132 Postsecondary Education Trailer Bill, 2021). As with other legislation, UC would have to adopt its own resolution to make it applicable.

Approved in October 2021 was Assembly Bill 928, which further reforms the ADT by directing CCC, CSU and UC to create a singular lower-division general education pathway that would apply to transfer to either 4-year segment (Student Transfer Achievement Reform Act of 2021: Associate Degree for Transfer Intersegmental Implementation Committee., 2021).

Transfer pathways will undoubtedly continue to evolve alongside student needs and policy priorities. Research can help evaluate the impact and efficacy of the systems in place leading students toward degree achievement.

CHAPTER TWO

LITERATURE REVIEW

This chapter will first present the conceptual frameworks on which the research is grounded—Perna's four-layered conceptual model of college choice, and Perna and Thomas's parallel four-layered model of student success. It will then review literature on college choice and success, organized by the layers in the model, starting from the inner layer of the individual student and moving to the outer layer of social, economic and policy context. The chapter will conclude with a discussion of the limitations of this research in capturing the theoretical framework conceptualized by the models.

Conceptual Framework

College Choice

This research is grounded in a conceptual model of college choice developed by Perna (2006), which is based on human capital theory but nested in a socio-environmental context. Becker (1962) framed college education as an investment in human capital, where individuals weigh the costs against the benefits to decide whether to attend college at all, and if so, which institution to attend. Human capital is also a framework for policymakers to think about investment in higher education, by creating returns in workforce productivity and the tax base, as well as numerous nonmonetary benefits for society (Paulsen, 1996). For individuals, the demand side of the equation is driven primarily by academic preparation, since those with greater achievement are better equipped to successfully graduate. On the supply side are the resources including family income, financial aid, and personal resources that will be contributed. All of this is weighed against the benefits in terms of the expected earning power to make a decision. The model assumes generally rational behavior, though some students may have difficulty

accurately estimating both costs and benefits due to a lack of information about things such as college costs, financial aid, and earning differentials (Perna, 2006).

Due to these shortcomings, among others, the traditional human capital model fails to both theoretically and empirically account for the variation seen among students in college choice. Theoretically, the model fails to account for non-monetary and intangible factors that influence the assessment of the monetary benefits and costs. Paulsen enumerates just some of these factors as "Differences in socioeconomic status and background, academic ability, access to information about postsecondary opportunities, financial opportunities in the credit markets, employment opportunities in the job markets, discriminatory practices in the credit or job markets or at institutions of higher education, and early home and school environments" (Paulsen, 2001). Empirically, studies that have tried to control for the supply and demand forces discussed above only partly explain college choices (Perna, 2006).

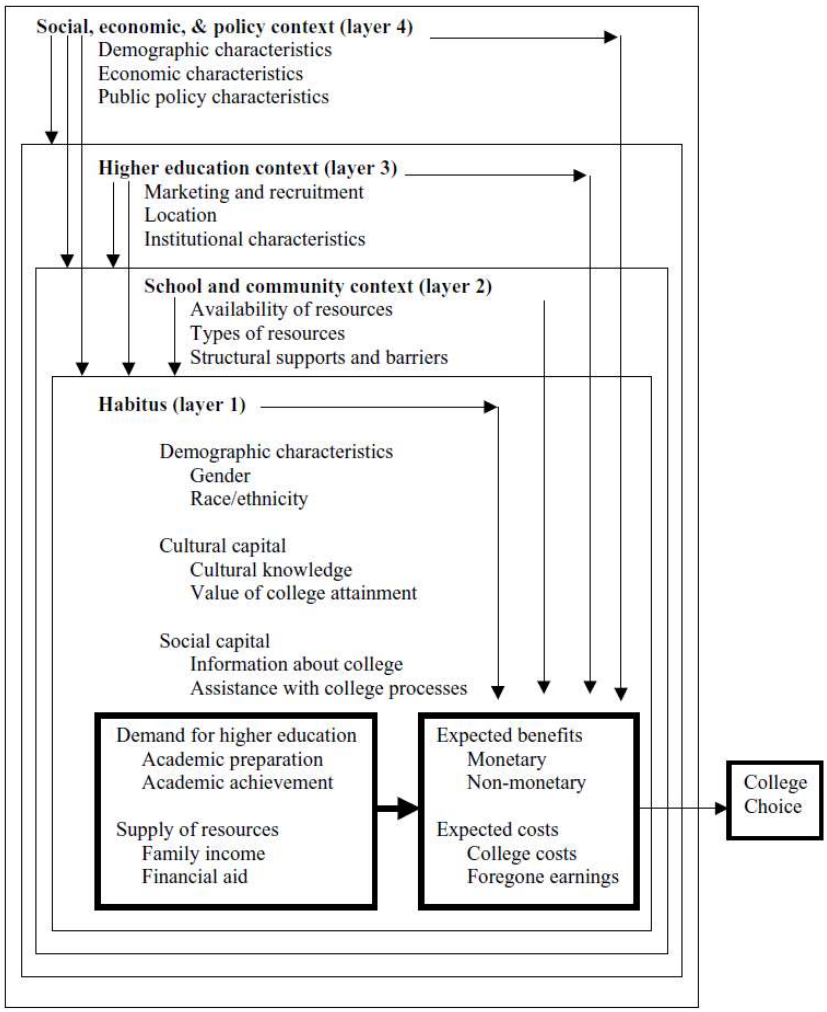
Given these limitations, Perna's conceptual model incorporates another rich approach to college choice: the sociological-cultural framework. Early approaches in this vein focused on the idea of "status attainment", arguing that educational attainment in particular "Serves both as a status variable of considerable importance in its own right and as a major facilitator of achievement in the occupational, economic, and social spheres" (Sewell & Hauser, 1972). This is supported empirically; a longitudinal study from childhood to mid-thirties finding that years of education mattered the most in determining adult social position, as measured by occupational status and qualifications (Schoon, 2008). Sociological status attainment studies focus on socioeconomic background as the key determinant of attainment, with effects that "Operate independently of ability and for both sexes at every stage of attainment in the higher education process" (Sewell & Hauser, 1972).

Later sociological studies introduced the idea of cultural and social capital. Like human capital, these are other forms of capital that can be converted, given the right circumstances, into economic capital (Bourdieu, 1986). Bourdieu identified cultural capital, which are things such as pronunciation and mannerisms that mark a class or region, as largely "Subject to hereditary transmission", in other words passed down through parents. Social capital, such as clubs and social networks that allow the transformation of "contingent relationships" into "durable obligations", also develop largely from families and are also largely controlled by them (Bourdieu, 1986). More modern conceptualizations of cultural and social capital, and how they apply to this research, are discussed later in this review.

By fusing the human capital and sociological cultural and social capital traditions, Perna's model posits that the weighing of costs against earnings is "nested within several layers of context." The model lays out four contextual layers: (1) the individual's habitus; (2) school and community context; (3) the higher education context; and (4) the broader social, economic, and policy context. These layers recognize that context can both restrict or expand choice beyond what is theorized by the basic human capital model where the individual acts autonomously. The school and community context may affect choice because of institutional agents such as teachers and counselors acting either as information providers or gatekeepers. The higher education environment may be actively involved through marketing and recruitment or passively involved through geographic location and particular characteristics. Finally, the outermost layer deals with social and policy changes, such as demographics, unemployment rates, or education and financial aid appropriations.

Figure 1

Proposed conceptual model of student college choice (Perna, 2006)



Perna's model informs this research by providing a framework to identify and group salient factors in the administrative dataset. The layered model allows the research to acknowledge both the individual motivations in the human capital framework and the societal opportunities and constraints present from cultural and social capital. Importantly, the model allows for variation among socioeconomic and racial/ethnic groups given differences in resources, environmental conditions, culture, and policies. Perna's model also makes clear the limitations of this research in capturing even a fraction of the influences that shape decisions.

The research will also rely on Perna's model to identify the key stakeholders, from students and schools to colleges and policymakers, who may have an interest in understanding the differential impact of contextual factors on college choice.

College outcomes

This research will also focus on college outcomes, to which Perna and Thomas (2008) have extended and adapted the college choice model. Their multidisciplinary research frames ten key indicators into four stages of outcomes, which they call student success transitions. The stages are: college readiness, college enrollment, college achievement, and postcollege attainment (Figure 2). The ten indicators were chosen based on reviews of state accountability systems. To understand these stages, they adapt Perna's (2006) college choice model to a multilevel model of success with four layers: internal context, family context, school context, and social, economic, and policy context. These layers are theorized as impacting both student attitudes and student behaviors, which drive the indicators of student success.

Figure 2

Transitions and Indicators of Student Success (Perna & Thomas, 2008)

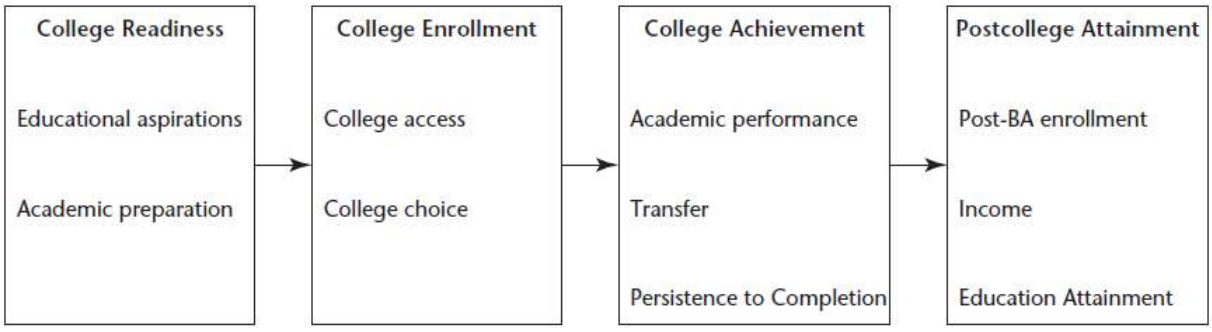
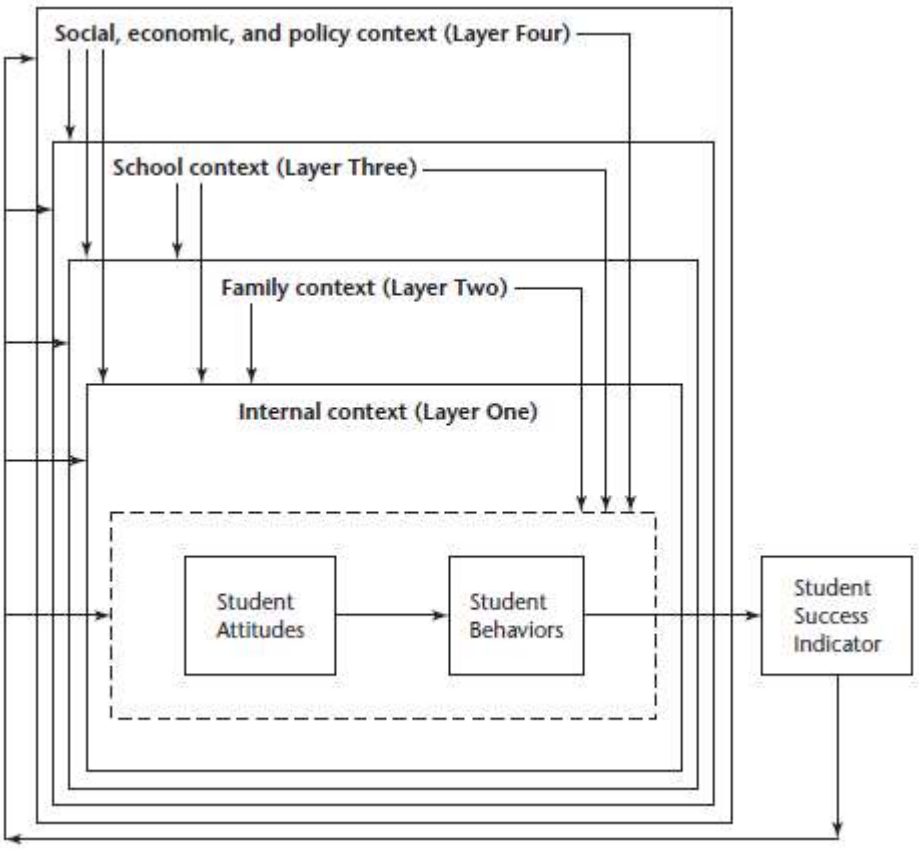


Figure 3

Proposed Conceptual Model of Student Success (Perna & Thomas, 2008)



The conceptualization of student success into phases reflects the longitudinal process of student success. It creates a framework for how success (or lack thereof) in one stage continues to affect outcomes in future stages. For this research, it operationalizes success into concrete data points. As Perna and Thomas acknowledge, this framework has downsides that also apply to the proposed research. It assumes a certain pathway toward a college degree, which is not every student's goal or intention. It also is not exhaustive, excluding additional outcomes such as pre-high school attainment, skill development, or career choice. And it ignores non-quantitative aspects of "success" that students may also value. Nevertheless, it is useful in framing key elements of student success with respect to college attainment.

Literature relating to choice

College choice is really a series of choices. College choice is a "complex, multistage process in which an individual develops aspirations to continue formal education beyond high school, followed later by a decision to attend a specific college, university or institution of advanced vocational training" (Hossler et al., 1989). Perna (2006) articulates decision points as "Determining educational and occupational aspirations, which institutions to consider, whether to attend college, and which college to attend."

Layer 1: Habitus

The term habitus originated with Bourdieu (1977, cited in Reay, 2004), who used the term to capture the concept of how an individual is not only part of a larger social world, but the social world embeds itself in the individual. In other words, the socially constructed elements of culture embody themselves in an individual's activities and thinking to become an integral part of them.

In Perna's first layer lie demographics, social capital, and cultural capital. In this research, basic gender and race/ethnicity identification serve as the demographic markers. In Perna's model, this first layer of internal context, while specific to the individual, interacts with the surrounding layers to shape student success.

Gender. Researchers have identified factors in which gender appears to contribute to educational choice via the pathway of parent and peer expectations and parental engagement (Wells et al., 2011). A confounding element in interpreting the research is that differences in parental behaviors influencing college enrollment toward girls and boys have changed dramatically over the past few decades (Reynolds & Burge, 2008). In 1992, Reynolds and Burge found that girls' perceived parental encouragement toward their college attendance met or

exceeded the perception of boys, a reversal from two decades earlier in 1972. This switch was particularly pronounced among White students. Other types of parental engagement include parent-child conversations, attendance at school events, and regulation of time (such as monitoring homework, television, or social events) (Carter & Wojtkiewicz, 2000). While Carter and Wojtkiewicz found that boys experienced greater attendance at school events, parent-child conversations and academic involvement seemed to favor girls, one hypothesis being a perceived need to counteract discrimination in the labor market.

Gender differences can also interact with social class and race. There is a larger gap in college expectations between women and men for those with "low" social capital (defined as no parents expecting a 4-year degree, most peers not planning to attend college, and parental involvement below the 25th percentile) (Wells et al., 2011). Women were 8 percent more likely to expect a 4-year degree than men, compared to 3.5 percent in the "high" social capital category. A racial/ethnic disparity emerged for students with low social capital, with White and Latino/a students of both genders expressing lower expectations than the overall average (Wells et al., 2011). This racial/ethnic gap was not present for students with high social capital.

Peer groups are another mediator where researchers have found gendered effects. Wells calls out research describing a "Culture of anti-intellectualism among male students in U.S. high schools which may suggest a perceived incompatibility between masculinity and a commitment to educational success" (Wells et al., 2011). A gender gap in achievement potentially emerges from "Different learning opportunities of, attitudes toward, and interest in math and English of boys and girls", which can be shaped by peer effects (Hao & Bonstead-Bruns, 1998). Overall, boys tend to have weaker social networks and peer relationships, intensifying their lack of social capital beyond that created by lesser parental involvement (Wells et al., 2011).

Race/Ethnicity and Nationality. Many of the same parental and peer influence factors discussed above also manifest differently by race/ethnicity. In 12th grade, Asian Americans had the highest expectations for degree attainment and Latinx students had the lowest (Hurtado et al., 1997). White and African American students had slightly higher expectations than White students. Hurtado and colleagues found the same pattern when asking about likelihood of attending a four-year institution. As far as applying to college by the end of high school, Latinx students were the least likely to have applied, followed by African Americans, White students, and Asian Americans. After controlling for a host of factors such as academic ability (measured as a self-reported rating), family income, and education, African American and Asian students emerged as having submitted the most applications. They point out, however, that the suggestion that students of color are more strategic ignores that few students meet the artificial criteria created by the statistical model where all else is held equal.

Another study looking at California students likewise found race/ethnicity differences in college choice. Even controlling for socioeconomic status, degree intention, academic preparation, and state institutional structures, Latino students still chose community colleges at higher rates (Kurlaender, 2006). The researchers speculated that factors such as program flexibility and the ability to live at home disproportionately affected Latino students.

Turning again to parental involvement, though African American and Hispanic students had lower rates of 4-year college enrollment after high school compared to Asian American and White students, their rates surpassed White students after controlling for school-level and student-level factors related to parent involvement and interaction (Perna & Titus, 2005). This indicated that much of the difference was explained by racial/ethnic differences in their measures of what they considered to be social capital. Perna and Titus also found, however, that the benefit

of parent-student discussions was smaller for African Americans while the benefit of parent-school discussions was larger.

Even at the school level, overall plans to attend a 2-year or 4-year college influenced a student's enrollment, regardless of the plans of the student's friends, and the same pattern was found for family income and parental expectations (Perna & Titus, 2005). The share of African Americans at a student's school decreased the chances of attending a 2-year college, while the share of Hispanic students increased that likelihood.

Many earlier studies only focused on the difference between White and African American students, with a smaller volume of more recent work available on Hispanic students (Perna, 2006). Asian Americans have received even less attention, and suffered from being treated as a homogenous group. For example, after disaggregating, Filipinos, Japanese, and Southeast Asians were nearly twice as likely to apply to only one campus as Chinese and Korean Americans (Teranishi et al., 2004). Moreover, among Asian Americans, wealthy Chinese Americans and Korean American students were more likely to take SAT preparation courses than their lower-income peers, but this pattern was reversed for Filipino Americans and Southeast Asian Americans. A review of over 100 works of research on Asian Americans and Pacific Islanders in higher education proposed the reframing of future studies on AAPIs to be more intentional in their use of panethnic terms and labels (particularly when it comes to NHPI populations) (Poon et al., 2016). The experience and background of Latinx students are also extremely diverse, with particular factors relating to immigration, parental education, and locale facing particular underrepresentation (González et al., 2003). Groups such as Native Americans are often just neglected completely in quantitative research due to small counts making it difficult to draw statistical conclusions (Hurtado et al., 1997). Native Hawaiian/Pacific Islander

students and multiracial students also experience this same neglect. All of these groups also face the same aggregation of their identities into monolithic groups that ignore the vast geographical, historical, and cultural differences spanning their identities.

Under census/federal definitions, and in this study's taxonomy, "non-resident aliens" are classified differently than domestic students, though citizenship/visa is not a component of "race/ethnicity". Hao and Bonstead-Bruns (1998) identify differences between immigrant and native students, but this is a different dividing line than one's legal status. There is a likely a fluid assimilation process that is not captured under the existing categorization.

Social and Cultural Capital. The idea of social capital was popularized separately by Coleman and Bourdieu in the 1980s, who framed somewhat different definitions. Coleman framed social capital in terms of norms that are primarily transmitted from parents to children or from other adults to parents. Bourdieu focused on the idea of "structural constraints and unequal resources based on class, gender, and race" (Dika & Singh, 2002). In Coleman's framing, these norms, values and attitudes are a means of positive social control. Indicators of social capital include family structure and parent-child interaction and are correlated with one's chance of dropping out of high school (Coleman, 1988). In contrast, Bourdieu sees social capital as a means of access to resources, and thus a means of the perpetuation of social class and power (Bourdieu, 1986). In a meta-analysis, Dika and Singh found support for the idea that Coleman's social capital was generally positively linked to both educational attainment and educational achievement, though noting that Coleman's vague formulation of the link between social and human capital limits the research (Dika & Singh, 2002). The American educational system is less standardized and bureaucratized than other developed countries, which both allows for social

mobility but also provides privileged families with greater power (An, 2010). This dynamic intersects with the other layers in the theoretical framework.

The concept of cultural capital in education was introduced by Bourdieu, who framed it as a form of embodied familiarity with culture largely unconsciously transmitted through the family (Bourdieu, 1986). Practically speaking, educational researchers have conceptualized it as fluency in 'highbrow' culture such as art, music, and elite aesthetics, based on a meta-analysis of studies invoking the concept (Lareau & Weininger, 2003). This analysis also found a tendency to separate cultural capital, as a form of elite status concentrated in subjects such as English or History, from technical and practical skills or ability, the latter of which are reflected in test scores and/or GPA and predominant in subjects such as Math. The avenue by which this affects educational performance is through teachers and authority figures identifying and aligning themselves with students with high cultural capital, allowing them to enjoy greater attention. It may be important to consider a broader concept of cultural capital, however, that leads to students not succeeding because they have lower aspirations or less information because of ignorance about cultural norms (Lareau & Weininger, 2003).

More recent research has taken traditional economically-oriented conceptions of capital and upturned them. Critical race theory as applied to education exposed the idea of "deficit-oriented research" that framed students of color, among others, as somehow lacking (Harper et al., 2016). Yosso argued that the idea of students of color coming with "cultural deficiencies" had to be replaced by a framework that valued the capital brought by communities of color (Yosso, 2005). In later research, attributes such as being a woman, first-generation, undocumented, or of color are seen as positive sources of wealth, and diversity is not seen as something to "deal with" but something to aspire to and be proud of (Laanan & Jain, 2016).

Laanan and Jain also warn that quantitative research is particularly prone to falling into a deficit model and advocate for more mixed methods approaches applying critical lens. Along these lines, the lenses of familial capital, aspirational capital, navigational/transfer student capital, social capital, and experiential capital can all argue for the formation of social capital through formal opportunities for student interaction (Mobley & Brawner, 2019). An alternative concept called "funds of identity" defines all aspects of a person's culture, family and background as valuable resources for learning and education (Esteban-Guitart & Moll, 2014).

Layer 2: School and Community Context

The second layer of Perna's model acknowledges the importance of social context. As previously mentioned, even after controlling for the influence of one's friends, the overall college aspirations of students at one's schools influenced behaviors (Perna & Titus, 2005). A high school's overall average academic achievement and socioeconomic status also play a role, as do a school's organizational contexts and processes (McDonough, 1997). Students who fail to apply to selective colleges are not necessarily more disadvantaged at an individual level, but rather "Come from districts too small to support selective high schools, are not in a critical mass of fellow high achievers, and are unlikely to encounter a teacher or schoolmate from an older cohort who attended a selective college" (Hoxby & Avery, 2012).

Bourdieu's social capital theory has been explicitly extended to look at the role of class, gender, and race/ethnicity in the educational context of school processes. For example, institutional agents, who are of high-status and authority in a student's social network, have been shown to provide social and institutional support to working-class Latinx, African American, and Asian youth (Stanton-Salazar, 2011). González (2003) identifies potential agents of social capital, including family, school, and college/university members, which are weighed against

agents of institutional neglect and abuse, both teachers, counselors and administrators as well as curriculum and ESL or special education tracking practices.

Charter school attendance status serves as an interesting variable that spans both the individual and school-level context. Regardless of race/ethnicity or income status, parents overwhelmingly choose charter schools with the hope of better educational quality (Kleitz et al., 2000). This may be a marker of the parental aspirations discussed earlier. Charter schools also operate under very different structures, bringing McDonough's idea of organizational structure into play. Just as one example, the charter school framework allowed counselors to implement innovation in college counseling and support, but the burdens of creating a charter school also distracted them from this task (Farmer-Hinton & McCullough, 2008). Empirically, one study found that in addition to boosting test scores, Boston's charter schools also shifted college choice from two-year to four-year schools (Angrist et al., 2016). Positive returns to college attendance, persistence, and quality were also found in a study of Chicago's 'No Excuses' charter schools (Davis & Heller, 2019).

Layers 3 and 4: Higher Education Context and Social, Economic and Policy Context

Structural elements related to the higher education context such as geography and financial aid play a role in college choice. Living closer to a community college increased the odds of attendance, as did the relative prevalence of two-year compared to four-year institutions (Rouse, 1995). Distance played a role in students ending up at lower quality institutions—the closer a student lived to the institution they chose to attend, the more likely that they were "undermatched" and could have attended a better institution given their academic preparation (Miller & Barreto, 2017). After controlling for student and zip-code factors, the number of colleges nearby was positively associated with the odds of applying to college (Turley, 2009)

and with better education and earnings overall (Card, 1993). Living near a "high-quality college" (defined as in the top half of Gourman's rankings) increased the quality of college attended only for low-income individuals (Do, 2004). Results from an analysis of the National Longitudinal Survey of Youth 1997 indicate that the chances of applying to a selective 4-year college decrease with a student's distance from one (Griffith & Rothstein, 2009). One possible confounding factor is the direction of the relationship (do ambitious or better-informed families choose to live near colleges?), but a study using geographic variation and proximity to 2- and 4-year colleges including neighborhood-level measures of urbanization and commuting zone fixed effects did not find evidence that families sort geographically based on proximity to institutions (Mountjoy, 2019).

Kim (2004) looked at whether differential responses to financial aid by race/ethnicity can complicate the idea of whether financial aid provides equal opportunity. Kim found that grants alone influenced White students were influenced to attend their first-choice (agnostic of financial aid) institution only if they received grants, whereas Asian American students were influenced by both grants and loans. On the other hand, neither grants nor loans influenced African American or Latinx students to attend their first-choice institution. These findings may indicate varying price sensitivity, as well as differences in awareness and preferences to attend one's desired institution.

Speaking to both distance and the higher education context, one approach divided variance in attainment, as measured by GPA, persistence, and degree attainment, into three portions relating to the student, the community college, and the 4-year institution (Umbach et al., 2019). This study found that most of the variation was due to individual factors, but nonetheless the institutional contribution is non-trivial. In particular, community colleges in closer proximity

to the 4-year institutions led to higher attainment. They also find that community colleges with larger enrollments boosted attainment, but large universities had the opposite effect. Their proposed explanation was that attending a larger CC eases the shock of transferring to a 4-year institution, but a large university increases the shock upon transfer.

The final level of the theoretical model includes social context such as the overall educational attainment in the population, economic context such as unemployment rates that shape the cost-benefit analysis, and policy characteristics such as alignment, or lack thereof, between K-12 and postsecondary curricula and requirements, or affirmative action policies (Perna, 2006). Quantitative studies have been contradictory about the role of societal educational attainment in an individual's choices, though the theories already discussed would allow for it (Perna, 2006).

Research on the 1960s to 1980s found an increase in community college enrollment when unemployment rates increased, which might have been even greater if instead of reducing investment during these times, states and local governments had done the opposite (Betts & McFarland, 1995). These pro-cyclical government investments also influence tuition prices and the availability of financial aid (Brown & Hoxby, 2014). During the Great Recession starting in 2007, these factors, coupled with losses in family incomes and wealth, led to declines in full-time enrollment overall, but increases in part-time enrollment, especially vocational, concentrated in students of color (Brown & Hoxby, 2014).

Student educational aspirations are undermined by the lack of curricular and assessment alignment between K-12 and postsecondary institutions, with different sets of knowledge and skills and standards in place (Venezia & Jaeger, 2013).

The Effects of College Choice on Outcomes

Internal Context

The first layer of Perna and Thomas's Conceptual Model of Student Success is the internal context, composed of a student's motivations and attitudes (Perna & Thomas, 2008). Two measures found to positively affect success, as measured by college grades, were perceived academic control and preoccupation with failure, with the combination of those two creating the strongest effect (Perry et al., 2001). Students experience a wide variety of emotions, both positive and negative in academic settings, and those play a role in motivation and achievement (Pekrun et al., 2002). Even after controlling for socioeconomic status, test scores, and GPA, a suite of constructs dubbed psychosocial and study skill factors, particularly academic self-efficacy and achievement motivation, predicted college outcomes (Robbins et al., 2004). Stereotype threat is another often-cited contributor to academic performance, affecting black students (Steele & Aronson, 1995), women (Spencer et al., 1999), and Latinx students (Guyll et al., 2010), among others. Other studies have identified the converse phenomenon "stereotype lift" as another contributor, particularly with Asian students in STEM (Franceschini et al., 2014); (McGee, 2018).

Family Context

The second layer of the model deals with family context. Family structure plays a role, with children from single mother or step parent families experiencing lower postsecondary enrollment and 4-year degree completion compared to those in traditional two-parent households (Martin, 2012); (Ver Ploeg, 2002). Parent financial investment, controlling on other factors seems to decrease GPA but increase completion rates; this may be explained by students "satisficing" by maintaining adequate progress but not maximizing goals (Hamilton, 2013).

More disconcertingly, parental support also increased the rate of failure and academic probation at a study at two Midwestern universities (Bodvarsson & Walker, 2004). Wealth is also pointed out as an oft-neglected component of SES; researchers study income, but wealth is likely more important (Conley, 2001), particularly when considering the black-white achievement gap (Orr, 2003). Particularly salient in California is the role of immigrant parents; immigration strongly influences educational attainment, and while second- and third-generation immigrants have made progress from their parents, concerns still exist for groups such as Mexican Americans (Reed et al., 2005). Different immigrant groups experience different status expectations, while factors such as retention of parental language stimulate achievement, giving Mexican immigrant children an advantage over Asian students who are less likely to retain their parents' languages (Hao & Bonstead-Bruns, 1998).

School Context

The two-year/four-year choice has been a particular focus of economic research on school effects (Perna & Thomas, 2008). Most studies tend to treat community colleges somewhat monolithically, ignoring quality differences among them (Kurlaender et al., 2016). Four-year colleges have been the focus of greater research, with selectivity a common metric (Pascarella & Terenzini, 2005).

Debates over efficacy of community colleges. The "class-reproduction school of community college scholarship" criticizes community colleges for reproducing existing structures by perpetuating a tiered system (K. Dougherty, 1987). This argument holds that community colleges reinforce a tracking system, channeling first-generation and less privileged students toward vocational programs, fueling the aforementioned growth. Rouse (1995) framed the debate as one of democratization versus diversion: community colleges both increase access

while potentially attracting students away from a better-resourced 4-year college with higher potential for success. Others, in contrast, highlight the open-access community college as providing a "second-chance policy" for the many students, particularly disadvantaged ones, who leave high school unprepared for college (Goldrick-Rab, 2010). This debate led Doughtery (1994) to call the institution the "Contradictory College", torn from its original academic mission in multiple directions by private and public interests. Businesses and students have wanted programs to provide workforce training, certificates, and credentials. Government officials have pushed transfer initiatives with the desire to save money and improve access. In some ways, the diversion portion of this debate has been rendered partially moot by cuts to higher education spending. With increasing cuts to funding, rather than funding 4-year enrollment spots based on demand, policymakers often fund a certain number of slots, limiting access (Gándara et al., 2005).

Brand and colleagues' review of the research supports that community colleges both foster social mobility by drawing in students who would otherwise not attend college, or hinder mobility by taking students away from 4-year institutions where they might have a better chance of success, leading them to call attention to the importance of thinking of the community college population as heterogeneous (Brand et al., 2014). Trying to capture the average "community college effect" should be avoided in favor of addressing the varied effects on those heterogeneous populations. While advantaged students are penalized, there are positive democratizing effects for the majority of the community college population, who are disadvantaged (Mountjoy, 2019; Brand et al., 2014). For instance, a study in Texas found that reductions in community college tuition increased their enrollments and transfer rates, not by drawing students who might have otherwise attended 4-year colleges, but those who might have

otherwise ended their education with high school (Denning, 2017). While these researchers covered the eventual outcomes on students at the margin of no college vs. 2-year attendance and 2-year vs. 4-year attendance, research on the aspect of time to degree, finding that attending a community college had an initial penalty until 125% of normal time, but after 6 years, the penalty had evaporated (Lichtenberger & Dietrich, 2017). In contrast, Sandy, Gonzalez, and Hilmer find a significant penalty to initially attending a community college, even controlling for family background, but are able to attribute most of this penalty to variation in student quality, not the quality of the institution (Sandy et al., 2006). Umbach (2019) finds the opposite: small individual effects but larger institutional effects: students attending community colleges with nearby four-year institutions have higher GPAs; larger community colleges also increase GPA; the selectivity of the four-year institution has a negative impact on GPA.

Controlling for bias in research on the school context. An inherent complication in trying to compare outcomes among students is selection bias, since admissions committees may select for the same characteristics that lead to better postsecondary outcomes (i.e., completion, higher earnings) (Dale & Krueger, 2002). A solution proposed by Dale and Krueger (2002) is to compare students who applied to and were accepted by the same set of colleges. Specifically, by comparing those who attended a selective institution to those who were accepted but chose a less-selective one instead, they found that the selective colleges only boosted earnings for low-income students. Using a propensity score matching design that paired transfer students with equivalent juniors from the same high school, another study found no significant effect on bachelor degree attainment (Dietrich & Lichtenberger, 2015). Research limited to only successful transfers and comparable freshmen found equivalent outcomes in credits earned and degree attainment rates (Melguizo et al., 2011). All of these studies corroborate a finding that the

penalty from community college is largely created during the first two years of community college enrollment due to widespread loss of credits, as well as unobservable characteristics that led students to choose community college in the first place, and not after transfer due to a lack of financial aid or persistence post-transfer (Monaghan & Attewell, 2015).

Using two types of educational aspirations: what one would like to complete and what one thinks they would actually complete, collected in the National Longitudinal Survey of Youth, as control variables, the positive effects of community colleges on some students' educational attainment outweigh the negative effect on others, increasing attainment by between 0.4 and 1 years on average (Leigh & Gill, 2003). This is contradicted by a study using the same expectation controls, while taking account non-traditional pathways and self-selection, finding a significant reduction in the chance of a bachelor's degree from attending a community college (Alfonso, 2006).

In another perspective, Hilmer (1997) found that students, especially those from poor families, are of low ability, or have poor high school performance, choose higher quality universities if they initially matriculate at a community college, perhaps offsetting the disadvantages from those attributes.

In summary, the results studying the impact of initially attending a community college are mixed and contradictory, highlighting the difficulty of using quasi-experimental methods to estimate an effect that is dependent on numerous factors both observable and unobservable, quantitative and qualitative. Researchers have applied different matching techniques and different sets of control variables to try to disentangle the effects, but ultimately the conclusions are mixed. Another propensity-score matching study argued that studies trying to control for background characteristics are flawed, because there is little overlap between students who

attend public four-year colleges and public two-year colleges (Stephan et al., 2009). The research agrees with other studies that public four-year college attendance compared to two-year attendance does have a significant positive effect, but this is for the atypical and most advantaged students who are actually deciding between the two. In other words, they argue that stratification is already present at college entry.

Factors Impeding Success at Community Colleges. Research presents multiple reasons why community college entrants might be less successful in obtaining a bachelor's degree. While differences in quality do appear to exist at California Community Colleges, research is needed about what institutional differences might be driving those effects (Kurlaender et al., 2016). One meta-analysis suggests that students are simply by and large not prepared when entering community college, with most remedial-type programs doing little to ameliorate that issue (T. Bailey & Smith Jaggars, 2016). If students do not enter a program of study quickly (within a year), they are unlikely to ever complete (Jenkins & Cho, 2012).

One literature review centered on research highlighting the lack of structure in community colleges, memorably comparing the quest for a degree to "Navigating a shapeless river on a dark night" (Scott-Clayton, 2011). Students are forced to make numerous decisions to make progress, with the default options usually leading toward failure. Community colleges are unnecessarily complex—for example, Harvard offers degrees in 43 fields with a core curriculum while the nearby community colleges offers 72 programs in 63 fields and no core--and both the lack of resources and the lack of student preparation leads to a lack of information (Scott-Clayton, 2011). A study of 14 community colleges found seven areas hindering students, especially the low-income students likely to enroll: "(1) bureaucratic hurdles, (2) confusing choices, (3) student-initiated guidance, (4) limited counselor availability, (5) poor advice from

staff, (6) delayed detection of costly mistakes, and (7) poor handling of conflicting demands" (Deil-Amen & Rosenbaum, 2003). This study as well as an analysis from Stephan and colleagues (Stephan et al., 2009) found positive effects from private 2-year colleges, and both studies partly attributed this to the highly-structured nature of those institutions, offering more support and fewer choices. Evidence supports discarding the "cafeteria-style" model for a "guided pathways" one (T. R. Bailey, 2015).

Institutional Investment. For higher education, increased institutional spending on instruction and research leads to a higher probability of employment and larger salaries, with a particular benefit to disadvantaged students (Griffith & Rask, 2016). The same research also found a smaller benefit to spending on student services, with the gains mostly accruing to more advantaged students. Investment in libraries also seemed to pay off for retention rates (Mezick, 2007). Investment in subsidized loans and need-based aid also are helpful to students, while merit aid is problematic, benefitting needy students less even when controlling for ability (Singell, 2004). A Massachusetts program that gave high-achieving students fee waivers to in-state public colleges diverted them from alternative private colleges with higher completion rates, lowering their chances of success (Cohodes & Goodman, 2014).

Institutional Selectivity. Selective institutions promote persistence and higher graduation rates, even for students that might seem to be underqualified (Alon & Tienda, 2005); (Kurlaender & Grodsky, 2013), and do the same thing for earnings, regardless of race or gender or an individual's grades (Pascarella & Smart, 1990). In particular, attending a state-flagship institution (whose identity was not disclosed) led to higher earnings, but only for white men (only white students were studied) (Hoekstra, 2009). Lower-income and minority students seem to do better starting at more selective, four-year institutions rather than less-selective and/or two-

year ones (Bowen et al., 2009); (Hoxby & Avery, 2012); (Hoxby & Turner, 2013). Relatively high-performing, though lower absolute-performing, students at disadvantaged high schools in Texas benefitted in enrollment, graduation, and earnings from attending selective institutions, while the converse of students with relatively low (within high-school) performance but higher absolute performance were not harmed (Black et al., 2020). A study of University of California students found similar results, with students admitted based on their relative high school performance in a program known as Eligibility in the Local Context increasing their five-year degree attainment by an astounding thirty percentage points (Bleemer, 2021a). The graduation and earning gains to these students, who were far more likely to be low-income, Black, or Hispanic than their UC peers, far outweighed the losses to the students they displaced.

In a study that looked at the interaction between college quality and student ability (i.e., Armed Services Vocational Aptitude Battery (ASVAB)), students of all ability groups were benefited comparably by college quality in their six-year completion rates, but students of higher ability benefited more from higher-quality colleges in their four-year completion rates (Dillon & Smith, 2020).

Even lesser quality institutions seem to benefit students, however. Students right above the threshold between public four-year college attendance or two-year/no college attendance in Georgia benefited from increased bachelor's completion rates (Smith et al., 2020). A study of students at the margin of 4-year attendance at a large public Florida state university found those above the cutoff out-attended and out-earned their peers right below the line (Zimmerman, 2014).

College quality has a significant impact on graduate doctoral degree attainment, though quality must be viewed as incorporating socioeconomic factors (Zhang, 2005). In particular, an

increase of one standard deviation in the selectivity of one's college leads to a 4.3% higher chance of earning a graduate degree, which thus is a path toward higher earnings (Seki, 2014).

Social, Economic, and Policy Context

The third layer and the fourth layer intersect in the sense that government policies driving investment and financial aid affect and contribute to institutional characteristics and quality. Interventions can be framed as supply-side (e.g., appropriations reducing tuition or increasing seats) or demand-side (e.g., financial aid, college savings plans, educational reforms, and desegregation/diversity initiatives) (Perna et al., 2005). An empirical study of state-level differences in appropriations and tuition found significant effects on enrollment levels from both these factors (Berger & Kostal, 2002). A study of a shift in federal aid policy found that every $1,000 (in 2001 dollars) of grant aid increased both the probability of college attendance and the average years of completed schooling (Dynarski, 2003). The aid recipients were disproportionately black and low-income but attended schools similar to the average student, indicating that aid also boosted the quality of institution (Dynarski, 2003).

Admissions policies are often a target of reform, and they are often aimed at racial/ethnic diversity and affect these groups differently (Niu et al., 2006); (Atkinson & Pelfrey, 2004). For example, the repeal of race-based affirmative action in California resulted in underrepresented applicants enrolling at lower-quality institutions and graduating at lower rates, with these detrimental effects persisting into graduate degree attainment and labor market outcomes (Bleemer, 2021b).

The Great Recession led to large increases in college enrollment across the two-year and four-year public and private spectrums of institutions, even more than unemployment levels might have predicted (Barrow & Davis, 2012). Local down times seem to increase for-profit

enrollment the most, followed by two-year vocational programs, with two-year academic transfer programs seeing less growth (Foote & Grosz, 2020). Economic cycles can affect the perception of career prospects, leading students to choose different majors in boom or bust times depending on perception and image (Yurtseven, 2002); (Margo & Siegfried, 1996). Higher unemployment rates seem to lead students toward more difficult, higher-earning majors with more employment prospects (Blom et al., 2021).

Application of the Literature to the Methodology and Limitations

This research is focused on the final stage the choice process as both Hossler and Gallagher (1987) and Perna (2006) describe it: limited to students who have applied and been admitted to the University of California. The act of applying to UC indicates that a student is likely aspiring to attend college, and a selective 4-year college at that. By focusing on the transfer mission, this research follows this advice of Brand and colleagues (2014) to avoid trying to find a singular effect of community college, focusing instead on the particular community college mission of transferring students to completion of a bachelor's degree, with a further focus on a particularly qualified subpopulation of those potential transfer students.

While race/ethnicity and gender are included in the dataset, the coarseness of the racial/ethnic and gender identification variables commit the sin identified by Poon and colleagues (2016) of relying on panethnic and overly broad classifications. As far as cultural and social capital, only parental educational attainment is included, missing the richness of parental aspirations, involvement, and encouragement identified in the research. Peer attitudes are also missing.

At the school and community context, the measure of percent free/reduced price lunch serves as a proxy for the socioeconomic status identified by McDonough (1997), while percent

A-G completion and average high school GPA and test scores control for academic achievement. The high school GPA and test scores only come from applicants to UC, however, creating bias due both to UC eligibility standards and self-selection due to perceived admissibility and other factors. The only variable included related to McDonough's conceptualization of the school organizational context is charter school attendance. Even this variable suffers from under-specification due to the wide range of charter schools, unlike the studies addressed that focused on one type and "brand" of charter school.

Limitations of the Research in Capturing the Theoretical Framework

The proposed research will not be able to capture all the theoretical aspects of choice nor success outlined by Perna. The data are limited to quantitative administrative data. Particularly absent features of the model are measures of cultural capital and social capital, though parent education data may capture some facets of this capital. Aside from distance measures, no elements of the higher education context are included. The fourth layer is also completely excluded, except to the extent that social and economic trends are partially controlled for by only including one cohort in one state. Another limitation of the data is the inability to capture heterogeneous impacts of the outer layers on the individual. For example, resources at a school may be distributed unequally, and the same public policy may be applied disproportionately.

CHAPTER THREE

RESEARCH DESIGN

Site and Sample

The study follows the 2014 cohort of freshman students admitted to the University of California (UC). Students apply through a centralized application system to up to all nine of the UC campuses offering undergraduate programs, though the admission decision is made independently by each campus. Students who meet UC eligibility criteria for admission but are not admitted to a campus at which they applied are offered admission at another campus with capacity, known as a referral admission. Students must affirmatively opt in to be counted as admitted, and very few do. This analysis focuses on freshman admits, who are students planning on attending college for the first time. This definition of first time includes an exception for students who have earned college credit, typically at a community college, before earning a high school diploma or during the summer prior to the fall term of college entrance.

The study is limited to students who attended and graduated from a California public high school. This focus facilitates the inclusion of high school level variables that feed into the theoretical model, such as socioeconomic factors and academic performance. These data are not available in a standardized form or at all for other students. The study uses the cohort applying for entrance in fall 2014, consisting of 55,378 admitted students from a CA public high school, representing 62 percent of all admits. 2014 is chosen to allow sufficient time for the study of six-year bachelor's degree outcomes. Six years after entrance, or one-hundred and fifty percent of the "normative" time of four years, is the key metric used by the National Center for Education Statistics in reporting graduation rates. (U.S. Department of Education, National Center for Education Statistics, 2020).

By limiting the set of students to those who were accepted to UC, this research employs a variation of the control strategy suggested by Dale and Krueger (2002). It is made less robust, however, by the limited set of UC campuses, and the grouping of them into sets. An additional difficulty is the lack of inclusion of the complete choice set available to the students in the research. Since community colleges are open access, those are a choice for everyone, but a further extension of this research would deal more rigorously with the choice set, perhaps by controlling for UC admission to alternate campuses or combining the dataset with CSU or other data.

Datasets

The main dataset is an administrative dataset of all applicant records to the University of California linked to enrollment and degree records. Identifying information such as name, birthdate, and SSN of the members of the first dataset is submitted to the National Student Clearinghouse (NSC) to produce the second dataset, which tracks where students enroll and if they earn any degrees or credentials. In the 2014 cohort, 96% of the students were matched to NSC records as enrolled in a participating NSC institution in the fall 2014 term. The students who were not found either did not enroll anywhere in the United States, enrolled at institutions that do not participate in NSC, did not match due to data issues, or opted out (also known as "blocking" their data).[1] Overall, this high match rate gives confidence in the results. While 96% of students were found in the fall term immediately after acceptance to UC, this study also looks

[1] As of 2011, more than 99% of public 4-year institutions, about 95% of public 2-year institutions, and 90% of 4-year non-profit institutions participated in NSC, but only about half of U.S. for-profit institutions participated, with participation generally growing over time. Enrollment coverage is about equal for males and females, but lower for Black and Hispanic students compared to White students (other groups were not analyzed) (Dynarski et al., 2015). NSC has identified race/ethnicity differences in the block rate, with Hispanic, nonresident Alien, American Indian, and Asian students having higher rates than Black, Native Hawaiian/Pacific Islander, and White students (*Impact of Directory Information Blocks on StudentTracker Results*, 2017).

at which students received a bachelor's degree within six years. Students who were initially matched may later not be found due to the same issues—they might have transferred to an international or non-participating institution, changed name, or opted out. Though administrative data on students who received a bachelor's from UC were available, they were not used in this analysis. Only NSC bachelor's recipient data were used. Institutions do not always report degrees earned to NSC, and sometimes the degree/certificate title is blank. For this analysis, only degree titles that could be identified as a bachelor's degree were included, so graduation rate estimates may be biased downward.

High school data came from the California Department of Education (CDE). Three separate files were used. The "Unduplicated Student Poverty – Free or Reduced-Price Meals Data 2013–14" file[2] provided the "Adjusted Percent (%) Eligible FRPM (K-12)" percentage used in the analysis. The "Public Schools and Districts" file[3] provided school addresses used in the distance calculations. These addresses were geocoded using ArcGIS to latitude/longitude coordinates. The "Graduates Meeting UC/CSU Entrance Requirements" file[4] for 2013-14 was used to obtain rates of A-G course completion by high school. Unfortunately, high school graduation rates were not available for this cohort of students. CDE has only recently started tracking cohorts from 9th grade in order to calculate high school graduation rates.

CCC, CSU, and UC institution latitude/longitude coordinates were obtained from the Integrated Postsecondary Education Data System (IPEDS) database, as collected by the Institutional Characteristics survey. Distances from the high school to CCC/CSU/UC were calculated using the "haversine" great-circle formula.

Measures

[2] https://www.cde.ca.gov/ds/ad/filessp.asp
[3] https://www.cde.ca.gov/ds/si/ds/pubschls.asp, downloaded January 2021
[4] https://www.cde.ca.gov/ds/ad/filesgradaf.asp

The following background measures are included in the analysis, listed below using Perna's framing of the four contextual layers as referenced in the literature review, and with more details provided in the following table:

- Habitus
    - Demographic characteristics: gender, race/ethnicity
    - Academic preparation/achievement: high school GPA, test scores, A-G courses
    - Social capital: parental education level
    - Supply of resources: family income
- School and community context
    - Free/reduced price meal percentage at the high school
    - Average GPA and test scores of applicants to UC at the high school
    - A-G course completion rate at the high school
- Higher education context
    - Campuses applied to
    - Proximity (distance) to UC, CSU and CCC campuses
    - Choice of initial enrollment (also used as an outcome measure)

The outcome measures used are:

- Choice of institution
- Bachelor's degree attainment (includes any type of bachelor's degree)
- Time to first bachelor's degree

Additional information about the coding and sourcing of the measures is in

Table 1.

Table 1

Variables, definitions, and sources

Individual variables

Variable	Definition	Data set source
Gender	Male, Female, Other/Unknown.	UC undergraduate application, self-reported
Race/Ethnicity	Federal categories: Hispanic/Latinx, African American, American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, White, Two or More Races, Unknown	UC undergraduate application, self-reported
High School GPA	Weighted and capped according to UC rules (*https://admission.universityofcalifornia.edu/admission-requirements/freshman-requirements/gpa-requirement.html*)	UC undergraduate application, self-reported
Test scores	SAT Reasoning Math + Reading + Writing score, or the ACT composite + ACT Writing score converted using the ETS concordance table.	UC undergraduate application database, as reported by testing agencies. Concordance table provided by ETS.
A-G courses completed	Number of high school courses completed, measured in semesters, that are approved toward the UC/CSU admissions subject requirements	UC undergraduate application, self-reported. Non-semester courses are converted to semester equivalents.
Parental education	Highest education level completed by either parent, grouped into the following categories: • No high school, some high school, or high school diploma • Some college or two-year college degree • Four-year college degree • Postgraduate study • Unknown	UC undergraduate application, self-reported

Individual variables

Variable	Definition	Data set source
Family income	Self-reported on the application in dollar amounts, capped at $999,999	UC undergraduate application, self-reported
Admitted UC campuses, grouped	Grouped into: Merced/Riverside/Santa Barbara/Santa Cruz; Davis/Irvine/San Diego; and Berkeley/Los Angeles; ranked by most popular cluster	UC application dataset
College destination choice	Degree-seeking programs, grouped into the following: UC, CCC, other institution, based on the first NSC record found	National Student Clearinghouse (NSC), UC application dataset

School-level variables

Variable	Definition	Data set source
Free/reduced price meal percentage (FRPM), student's high school	"The percent of students eligible for free or reduced price meals (FRPM). [*FRPM Count (K-12)* divided by *Enrollment (K-12)*]."	Based on 2019-20 data file https://www.cde.ca.gov/ds/sd/sd/fsspfrpm.asp
Charter school status	Charter school as of 2013-14.	California Department of Education
A-G completion rate	The percentage of cohort graduates who met A-G course requirements for a UC or CSU school.	2013-14 data file, California Department of Education
Average test scores of applicants to UC	The mean test score (using the procedure outlined above) for that application year	UC application data set
Average GPA of applicants to UC	The mean of high school GPA (using the weighted capped GPA) for that application year	UC application data set
Distance from high school to UC campus	The nearest UC campus admitted to out of the campuses in the group	School addresses from California Department of Education
Distance from high school to closest three CSU campuses	The average distance from the high school to the nearest three CSU campuses	CSU addresses from IPEDS

School-level variables

Variable	Definition	Data set source
Distance from high school to closest three CCC campuses	The average distance from the high school to the nearest three CCC campuses	CCC addresses from IPEDS

Outcome variables

Variable	Definition	Data set source
College destination choice	Degree-seeking programs, grouped into the following: UC, CCC, other institution, based on the first NSC record found	National Student Clearinghouse (NSC), UC application dataset
Degree earned	Degree	National Student Clearinghouse (NSC)
Time to bachelor's degree	Measured in elapsed terms/years from October 1, 2014 to degree awarded date, cut off at September 30, 2020	National Student Clearinghouse (NSC)

Institution Choice and Grouping

The choice of institution is put into six groups: "Same UC" indicates that students enrolled at the campus under consideration. "Other UC" indicates the student enrolled at a different UC campus. "CSU" is any of the California State Universities. "CCC" is any of the California Community Colleges. "Other" includes any other institutions participating in the NSC, 2-year or 4-year, public or private. "No match" indicates that they were not found in the National Student Clearinghouse data within a year after admission.

I grouped students into three categories based on the UC campus to which they were admitted based on the campus' yield rate (the percentage of admits who enroll) for 2014, shown in Figure 4. Subsequent analyses are stratified by these categories. Merced, Santa Cruz, Riverside, and Santa Barbara, with rates ranging from 11% to 20%, are in the first group. San

Diego, Davis, and Irvine, with rates from 23% to 26%, are in the second group. UCLA and Berkeley, with rates of 49% and 52%, are in the third group. The aim of these groups is to very roughly group campuses by popularity, as defined by being campus with the highest yield rate among those to which a student is admitted. Mean high school GPA and test scores were also evaluated as possible alternatives to yield rate for the purpose of grouping. While the ranking of campuses changes slightly using these metrics, the grouping (top two, middle three, and bottom four) does not change with the exception of Santa Barbara for test scores, as shown in Table 2.

Figure 4

Yield rate by campus

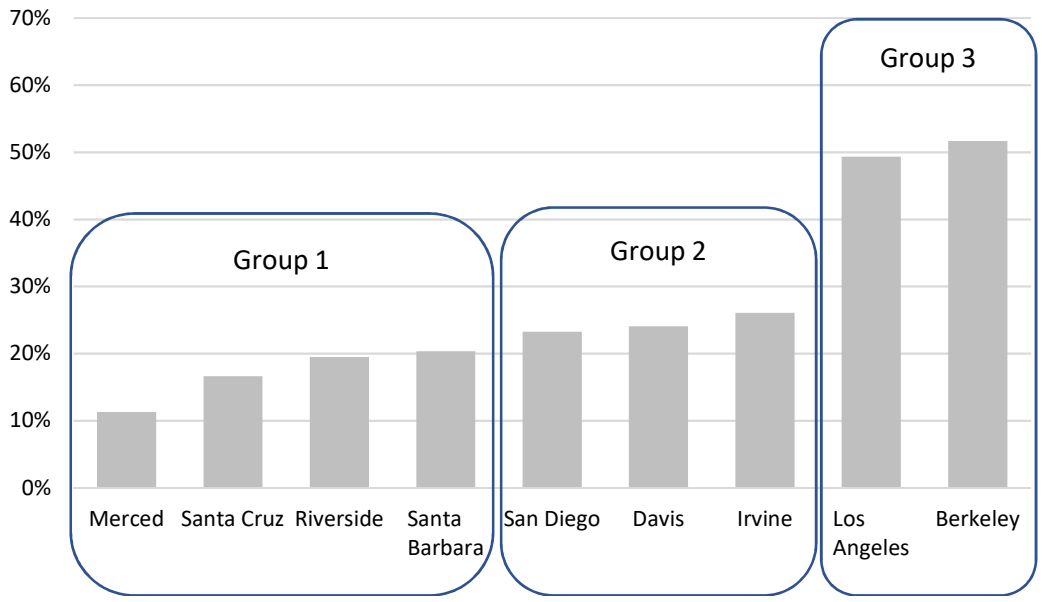


Table 2

Mean test score and high school GPA of admitted students

	Mean HS GPA	HS GPA rank	Mean test score	Test score rank
Merced	3.63	9	1636	9
Riverside	3.78	8	1744	8
Santa Cruz	3.87	7	1796	7
Santa Barbara	4.05	6	1923	4
Irvine	4.08	5	1871	6

	Mean HS GPA	HS GPA rank	Mean test score	Test score rank
Davis	4.12	4	1922	5
San Diego	4.19	3	2011	3
Berkeley	4.21	2	2059	1
UCLA	4.22	1	2034	2

Examining enrollment choice by admitted-campus group reveals some notable differences. While students in group 3 were about 25 percent more likely than students in group 2 and 60 percent more likely than students in group 1 to attend UC, the disparities are much more striking when looking at CSU and CCC. There, students in group 1 were more than ten times as likely to attend CSU or CCC as their peers in group 3. (Individual campus results are available in the Appendix.)

Table 3

Enrollment choice by admitted-campus group

	UC in group	Other UC	CSU	CCC	Other	No Match	N
1: MC RV SB SC	41.6%		24.6%	10.7%	18.2%	4.9%	23,526
2: DV IR SD	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,214
3: BK LA	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,581
UC	50.7%	5.4%	15.1%	6.4%	18.3%	4.1%	55,321

For the purposes of analysis by groups, each student is only counted once, even if they were admitted to multiple campuses within the group. Students who are admitted to campuses in multiple groups are only counted once with group 3 (Berkeley and UCLA) taking precedence over groups 2 (Davis, Irvine, and San Diego) and 1 (Merced, Riverside, Santa Barbara, and Santa Cruz), and group 2 taking precedence over group 1. In other words, a student admitted to campuses in all three groups or in groups 3 and 1 or 3 and 2 will only be analyzed as part of group 3; a student admitted to groups 2 and 1 will only be analyzed as part of group 2. Although

admissions are not strictly transitive, the group 3 institutions are the most academically selective, as shown by Table 2, and the group 2 institutions are more academically selective than group 1. Thus it is more likely that a student who is admitted to group 3 would also be able to obtain admission to group 1, and likewise for group 2 admits applying to group 1 institutions. In fact, of the students admitted to institutions in group 3 who also applied to group 1, 97% were admitted to group 1 institutions. Of the students admitted to institutions in group 2 who also applied to group 1, 91% were admitted to group 1. By only including students once in each group, this design helps to isolate the effects on each group of students; otherwise, the effect on students in group 1 are diluted by students from groups 2 or 3, for example. The overlap among groups and the results of applying this rule are shown in Table 4.

Table 4

Crosstabulation of students who are admitted to multiple UC campus groups

			Overlap with students also admitted to			
		Total admits	Group 3	Group 2	Group 1	**Used in analysis**
Students admitted to	**Group 3**	10,594	--	8,938	6,102	**10,594**
	Group 2	30,165	8,938 (excluded)	--	18,983	**21,227**
	Group 1	43,339	6,102 (excluded)	13,680 (excluded)		**23,557**

For the enrollment choice variable, students are counted in the "UC in group" category if they enrolled at any of the campuses within the group and "Other UC" if they enrolled at a UC campus not a member of the group.

Analysis

The analysis will take two parts. First, a descriptive analysis will explore the differences in the variables of interest by institution choice. Quantitative variables will be binned into categorical ones for ease of interpretation of the tables, but the underlying quantitative values are

retained and used in the regression modeling. A descriptive analysis will be done comparing four and six-year graduation rates by institution choice.

The second part of the analysis will further examine the relationship between institution choice and college graduation by using logistic regression modeling to adjust the raw differences by observable characteristics. For the model predicting graduation, the research will employ a technique of starting with a base model and then adding additional covariates sequentially that correspond to the contextual layers in the theoretical framework. As each layer is added, one can use the pseudo R-squared to assess the relative improvement in the model fit. Observations with missing values for variables in the model being run are excluded. As shown in the Appendix, the full model for group 1 retains 89 percent of its observations, group 2 retains 90 percent, and group 3 retains 88 percent. Given the relatively small share of missing values, no attempt was made at imputing missing values.

Reporting and Interpretation of Results. This research will also report what is known as marginal effects for the graduation prediction. Marginal effects can be interpreted as how the predicted probability of graduation changes as the variable of interest (in this case, college choice) changes, after controlling for the other variables in the model. While different calculations for marginal effects exist, here the average predicted probability is calculated for all students in the dataset by setting the enrollment choice to the specified choice of interest, calculating the predicted probability of graduation using the estimated regression coefficient for each remaining independent variable in the model per student, then averaging the result. The resulting probability is then contrasted against the reference group (UC in group) to calculate the results. The result can be interpreted as the predicted change in graduation rate (measured in percentage points), compared to attending a UC in group. If the marginal effect of attending a

CCC relative to UC in group is -0.25, this means that the model estimates that attending CCC would be associated with a 25 percentage point lower chance of graduating.

Regression techniques also employ tests of statistical significance and fit. In these models, the significance of individual coefficients is tested using the Wald chi-square statistic. This essentially tests whether a particular variable is making a contribution to the model. The results are noted for different levels of statistical significance ($p<0.5$, $p<0.1$, $p<0.001$) to allow the reader to make a judgement about which level of significance to use. The significance of the marginal effects is also presented in the same way, with the significance testing whether the marginal effect of an alternative enrollment compared to UC in group enrollment is statistically significant from zero. Note that the statistical significance of the coefficient may not be the same as the statistical significance of the marginal effect. Because of the way the marginal effect is calculated, two different tests of significance are at play. The change in coefficient on a variable of interest does not depend on the values of the other variables, because the coefficient is calculating the change in log-odds between two theoretical observations which are the same but only differ on the variable of interest. On the other hand, the marginal effect calculation is calculating the average change in probability across all observations if the variable of interest changes, which is dependent on the values of all the other variables.

In terms of the model fit, a pseudo R-squared figure as defined by McFadden is presented. Unlike a linear regression R-squared, which has a clear interpretation as the proportion of variation that is explained, this pseudo R-squared, or others like it, do not have a straightforward connection to predictive efficiency, and should be used with caution and in conjunction with other indices such as the individual coefficients (Peng et al., 2002).

CHAPTER FOUR

RESULTS

Overall, slightly more than half of the admitted freshmen in the sample cohort chose to attend UC. About 15 percent went to CSU and 6 percent to CCC. Eighteen percent went elsewhere and the remainder of about 4 percent were not found in the Clearinghouse data.

Personal-Level Characteristics

Sex and Race/Ethnicity

Overall, females outnumber males in the freshman admit population by a ratio of about 4 to 3, which while disproportionate is still slightly lower than the national average of 3 to 2 (Wells et al., 2011). The distribution of enrollment does not show differences of more than a few percentage points. Females in groups 1 and 2 were less likely to enroll at UC and more likely to enroll at CSU. In group 3, females were more likely to enroll at UC. The differences between groups 1 and 2 and group 3 do not fall in a consistent pattern—the first shows females more likely to turn down UC for a less selective institution (i.e., CSU or CCC), while the second shows the opposite.

Table 5

Enrollment choice by gender

		UC in group	Other UC	CSU	CCC	Other	No Match	N
1: MC, RV, SB, SC	Male	42.8%		23.7%	10.8%	17.8%	4.9%	10,442
	Female	40.6%		25.4%	10.6%	18.5%	4.8%	13,084
	Total	41.6%		24.6%	10.7%	18.2%	4.9%	23,526
2: DV, IR, SD	Male	54.4%	11.0%	10.6%	3.8%	16.9%	3.3%	8,826
	Female	51.8%	10.8%	11.1%	4.8%	17.9%	3.5%	12,388
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,214

		UC in group	Other UC	CSU	CCC	Other	No Match	N
	Male	65.8%	5.5%	1.8%	0.9%	21.6%	4.3%	4,440
3: BK, LA	Female	66.9%	6.5%	2.2%	1.1%	19.5%	3.8%	6,141
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,581
	Male	51.5%	5.2%	14.7%	6.3%	18.1%	4.2%	23,708
All UC	Female	50.1%	5.5%	15.3%	6.5%	18.5%	4.1%	31,613
	Total	50.7%	5.4%	15.1%	6.4%	18.3%	4.1%	55,321

Note. Unknown/missing gender are not shown in the table. "Other UC" is blank for group 1 because any students admitted to groups 2 or 3 are placed in those groups.

In group 1, White students had the lowest UC enrollment rate and American Indian/Alaska Native the highest. Asian, Hispanic, and African American students were all more likely than average to enroll in UC. African American and White students had the lowest CCC enrollment rates, with both of these groups much more likely to choose other institutions. Hispanic students were more likely than average to enroll in CSU or CCC. In group 2, the same patterns held true. In group 3, African American and nonresident students had the highest UC enrollment rate. The patterns observed are consistent with the literature, where non-White students are more likely to enroll in more selective institutions, given that they are admitted.

Table 6

Enrollment choice by race/ethnicity distribution[5]

		UC in group	Other UC	CSU	CCC	Other	No Match	N
1: MC, RV, SB, SC	Afr Am/Black	43.7%		22.0%	7.3%	23.7%	3.3%	778
	AIAN	54.4%		10.9%	10.9%	19.6%	4.4%	46
	Asian	45.6%		24.0%	11.1%	16.2%	3.1%	6,801
	Hispanic	42.7%		28.7%	11.4%	11.2%	6.1%	7,903
	NHPI	36.2%		29.3%	12.9%	16.4%	5.2%	116
	White	35.4%		22.4%	9.3%	28.4%	4.5%	5,584
	Two Or More	38.2%		21.0%	9.9%	26.9%	4.0%	1,252
	Non-Resident	44.0%		17.9%	15.8%	9.9%	12.4%	789
	Total	41.6%		24.7%	10.7%	18.0%	4.8%	23,269
2: DV, IR, SD	Afr Am/Black	53.3%	9.5%	9.8%	3.4%	20.3%	3.7%	379
	AIAN	50.0%	10.7%	14.3%	3.6%	17.9%	3.6%	28
	Asian	65.7%	6.9%	6.3%	3.5%	15.2%	2.5%	7,150
	Hispanic	51.8%	13.9%	13.4%	5.4%	11.7%	3.9%	5,927
	NHPI	45.6%	17.7%	10.1%	7.6%	17.7%	1.3%	79
	White	39.0%	13.6%	14.2%	4.2%	25.9%	3.2%	5,551
	Two Or More	45.4%	12.4%	12.2%	4.3%	21.6%	4.1%	1,134
	Non-Resident	59.3%	4.7%	11.3%	6.6%	7.7%	10.5%	638
	Total	53.0%	11.0%	11.0%	4.4%	17.3%	3.4%	20,886
3: BK & LA	Afr Am/Black	70.9%	3.7%	2.0%	0.3%	20.7%	2.4%	295
	AIAN	55.0%	5.0%		5.0%	25.0%	10.0%	20
	Asian	66.8%	5.8%	1.3%	0.8%	21.8%	3.6%	3,887
	Hispanic	66.5%	8.1%	2.4%	1.7%	17.4%	4.0%	2,370
	NHPI	72.0%	4.0%			12.0%	12.0%	25
	White	63.1%	6.1%	3.1%	0.9%	22.2%	4.6%	2,695
	Two Or More	65.4%	4.3%	2.4%	1.2%	22.7%	4.1%	586
	Non-Resident	86.1%	4.6%	1.4%	0.9%	3.2%	3.9%	439
	Total	66.6%	6.2%	2.1%	1.0%	20.1%	4.0%	10,317

[5] Uses federal race/ethnicity reporting categories. According to federal rules, non-resident aliens (those who are not U.S. citizens, permanent residents, or certain protected visa holders such as refugees) are reported in that category regardless of race/ethnicity. Students identifying Hispanic ethnicity are reported as such regardless of race. American Indian/Alaska Native (AIAN) students each represent less than 0.5% of the population, which complicates drawing any conclusions.

		UC in group	Other UC	CSU	CCC	Other	No Match	N
	Afr Am/Black	51.7%	3.2%	14.7%	4.9%	22.2%	3.2%	1,452
	AIAN	53.2%	4.3%	9.6%	7.5%	20.2%	5.3%	94
	Asian	58.3%	4.0%	11.9%	5.8%	17.0%	3.0%	17,838
	Hispanic	49.5%	6.3%	19.2%	7.8%	12.3%	5.0%	16,200
All	NHPI	43.6%	6.8%	19.1%	9.6%	16.4%	4.6%	220
	White	42.2%	6.7%	15.3%	5.6%	26.2%	4.0%	13,830
	Two Or More	46.3%	5.6%	14.0%	6.1%	24.1%	4.1%	2,972
	Non-Resident	59.1%	2.7%	11.7%	9.2%	7.6%	9.8%	1,866
	Total	50.7%	5.4%	15.2%	6.5%	18.1%	4.1%	54,472

Note. Unknown/missing race/ethnicity are not shown in the table. AIAN=American Indian/Alaska Native; NHPI=Native Hawaiian/Pacific Islander

Parental Education and Family Income

Parental education is based on the highest level of either parent's education as self-reported on the undergraduate application. In group 1, students were most likely to come from families with a high school education or below. In groups 2 and 3, students' parents were most likely to have a postgraduate education. The chances of attending a UC in the group generally declined with increasing parental education (Table 8), with greater percentages choosing to attend other institutions (which would include private and out-of-state colleges and universities). The high school or below and some college/2-year degree group showed comparable results as far as UC in group enrollment, but the high school or below group was more likely to choose CSU in group 1. All three groups also showed a declining preference for CSU or CCC with increasing parental education levels.

Table 7

Distribution of level of highest parent's education by campus group

	HS or below	Some college/2 yr deg	Four-Year Graduate	Postgraduate Study	Unknown
1: MC RV SB SC	32.4%	17.5%	24.4%	24.0%	1.7%
2: DV IR SD	29.0%	16.8%	24.5%	28.4%	1.3%
3: BK LA	23.4%	11.5%	23.4%	40.3%	1.4%
UC	29.4%	16.1%	24.3%	28.8%	1.5%

Table 8

Enrollment choice by level of highest parent's education

	Parent Ed	UC in group	Other UC	CSU	CCC	Other	No match	Grand Total
MC RV SB SC	HS or below	44.6%		29.5%	12.1%	7.6%	6.2%	7,642
	Some college/2 yr deg	45.2%		25.4%	12.2%	13.2%	4.1%	4,110
	Four-Year Graduate	40.2%		23.0%	10.4%	22.3%	4.2%	5,756
	Postgraduate Study	36.6%		19.2%	8.0%	31.8%	4.4%	5,648
	Unknown	38.7%		25.4%	11.5%	19.5%	5.0%	401
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	HS or below	59.8%	12.1%	11.8%	5.1%	7.7%	3.5%	6,151
	Some college/2 yr deg	58.3%	10.9%	12.2%	5.3%	11.1%	2.2%	3,562
	Four-Year Graduate	50.5%	9.7%	11.6%	4.6%	20.5%	3.1%	5,208
	Postgraduate Study	44.6%	10.9%	8.8%	3.0%	28.5%	4.2%	6,023
	Unknown	54.8%	7.8%	7.4%	2.8%	21.9%	5.3%	283
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227
BK LA	HS or below	71.7%	8.2%	2.3%	1.6%	12.9%	3.3%	2,481
	Some college/2 yr deg	71.8%	9.1%	3.0%	1.4%	12.6%	2.1%	1,214
	Four-Year Graduate	68.9%	5.4%	2.1%	1.1%	18.9%	3.7%	2,482
	Postgraduate Study	60.2%	4.6%	1.8%	0.6%	27.9%	5.0%	4,270
	Unknown	67.4%	2.7%	0.7%	0.7%	23.1%	5.4%	147
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	HS or below	60.3%		18.7%	7.8%	8.5%	4.7%	16,274
	Some college/2 yr deg	59.7%		17.1%	8.0%	12.3%	3.1%	8,886
	Four-Year Graduate	54.2%		14.7%	6.4%	21.0%	3.7%	13,446
	Postgraduate Study	51.3%		10.6%	4.1%	29.5%	4.5%	15,941
	Unknown	52.4%		14.9%	6.6%	20.9%	5.2%	831
	Total	56.0%		15.1%	6.4%	18.3%	4.2%	55,378

Family income is also self-reported on the application. Family incomes increased going from group 1 to group 2 to group 3 (as shown in Table 5). Similar to parent education, students in all three groups showed declining enrollment shares at UC as family income increased, with increasing preference for the other category. The preference for CSU and CCC also decreased with income in group 1, but did not show a clear pattern in groups 2 and 3.

Table 9

Family income distribution by campus group

	0 to <30K	30K to <60K	60K to <90K	120K+	Unknown	
1: MC RV SB SC	35.3%	21.4%	12.7%	24.1%	6.5%	100.0%
2: DV IR SD	30.6%	21.5%	14.1%	27.6%	6.2%	100.0%
3: BK LA	25.5%	18.6%	12.7%	34.5%	8.7%	100.0%
UC	31.6%	20.9%	13.3%	27.4%	6.8%	100.0%

Table 10

Enrollment choice by family income group

		UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	0 to <30K	44.8%		28.7%	11.9%	8.5%	6.0%	8,318
	30K to <60K	47.3%		24.1%	11.6%	13.5%	3.5%	5,046
	60K to <90K	40.8%		23.6%	11.1%	20.2%	4.3%	2,995
	120K+	35.3%		20.9%	8.5%	31.1%	4.3%	5,671
	Unknown	30.3%		20.4%	8.7%	34.5%	6.2%	1,527
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	0 to <30K	59.3%	11.7%	11.3%	4.9%	9.0%	3.8%	6,487
	30K to <60K	56.7%	11.4%	10.5%	4.7%	14.0%	2.8%	4,570
	60K to <90K	53.5%	10.3%	11.7%	4.9%	16.7%	2.9%	2,999
	120K+	45.0%	10.2%	11.3%	3.3%	26.8%	3.5%	5,859
	Unknown	41.9%	9.6%	7.4%	4.3%	31.6%	5.1%	1,312
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227

		UC in group	Other UC	CSU	CCC	Other	No match	N
BK LA	0 to <30K	71.9%	7.6%	2.5%	1.5%	12.9%	3.6%	2,699
	30K to <60K	68.7%	7.0%	2.0%	0.8%	17.8%	3.7%	1,968
	60K to <90K	66.1%	6.3%	2.8%	1.1%	20.5%	3.4%	1,344
	120K+	63.1%	5.2%	1.9%	0.9%	24.8%	4.2%	3,657
	Unknown	58.4%	3.2%	1.0%	0.5%	30.8%	6.1%	926
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	0 to <30K	59.9%		18.2%	7.7%	9.4%	4.8%	17,504
	30K to <60K	60.3%		15.0%	7.0%	14.4%	3.3%	11,584
	60K to <90K	56.0%		14.9%	6.8%	18.8%	3.6%	7,338
	120K+	50.9%		12.6%	4.6%	27.9%	3.9%	15,187
	Unknown	45.4%		11.1%	5.2%	32.6%	5.8%	3,765
	Total	56.0%		15.1%	6.4%	18.3%	4.2%	55,378

Academic Preparation

Courses that satisfy UC/CSU requirements for admission are colloquially known as "A-G" courses. For the purposes of this analysis, they are represented in semesters. Looking at Table 11, students completed increasing numbers of these courses going from group 1 to 2 to 3. With increasing A-G course completion came declining rates of enrolling in UC, CSU, and CCC across all three groups, with increasing shares of students choosing other institutions.

Table 11

Distribution of A-G (semester) courses taken by campus group

	<45	45 to <50	50 to <55	55+	Unknown
1: MC RV SB SC	44.0%	31.8%	16.8%	7.5%	0.0%
2: DV IR SD	36.5%	33.0%	21.1%	9.5%	0.0%
3: BK LA	23.5%	31.7%	27.6%	17.2%	0.1%
UC	37.2%	32.2%	20.5%	10.1%	0.0%

Table 12

Enrollment choice by A-G courses completed

		UC in group	Other UC	CSU	CCC	Other	No match	N
1: MC RV SB SC	<45	42.1%		28.5%	11.8%	12.8%	4.9%	10,356
	45 to <50	41.8%		23.8%	10.7%	19.2%	4.6%	7,495
	50 to <55	41.6%		19.6%	8.4%	25.3%	5.0%	3,951
	55+	37.7%		17.2%	9.9%	29.4%	5.9%	1,755
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
2: DV IR SD	<45	54.5%	13.0%	13.0%	5.0%	11.7%	2.9%	7,738
	45 to <50	54.3%	10.6%	10.7%	4.0%	17.1%	3.4%	6,994
	50 to <55	50.7%	9.3%	8.7%	4.0%	23.6%	3.8%	4,474
	55+	46.9%	7.7%	8.7%	4.2%	27.7%	4.9%	2,021
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227
3: BK LA	<45	72.3%	8.9%	2.4%	1.2%	12.1%	3.1%	2,497
	45 to <50	69.0%	6.9%	2.2%	1.2%	17.7%	3.1%	3,354
	50 to <55	63.6%	4.6%	1.7%	0.9%	24.4%	4.8%	2,919
	55+	57.7%	3.5%	2.0%	0.7%	30.7%	5.5%	1,824
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<45	56.4%		19.5%	7.9%	12.3%	3.9%	20,591
	45 to <50	57.3%		14.6%	6.3%	18.1%	3.8%	17,843
	50 to <55	55.7%		10.7%	4.7%	24.4%	4.5%	11,344
	55+	51.4%		9.2%	4.8%	29.2%	5.4%	5,600
	Total	56.0%		15.1%	6.4%	18.3%	4.2%	55,378

Note: The 9 students with unknown A-G are not shown in the above table.

Just as with A-G, GPAs and test scores also increased going from group 1 to 2 to 3. Groups 2 and 3 showed declining preference for UC as GPAs or test scores increased, but this same pattern was not reflected in group 1. Looking at the overall pattern at UC obscures these trends, because of how the share of students are distributed by GPA and test score. The trends for all three of the academic preparation areas all seem to indicate that UC and the other California public options become less desirable with increasing preparation, which follows logically under the assumption that these students would have more options available to them.

Table 13

Distribution of high school GPA (weighted, capped) by campus group

	<3.4	3.4 to <3.8	3.8 to <4.2	4.2+	Unknown	
1: MC RV SB SC	19.6%	46.7%	31.0%	2.4%	0.4%	100.0%
2: DV IR SD	1.7%	10.2%	63.2%	24.5%	0.4%	100.0%
3: BK LA	1.0%	3.8%	29.1%	65.6%	0.5%	100.0%
UC	9.2%	24.5%	43.0%	22.9%	0.4%	100.0%

Note: Unknown GPA may be due to incomplete information at the time of initial application that was later rectified with individual UC campuses applied to and not part of the systemwide dataset.

Table 14

Enrollment choice by high school GPA

		UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	<3.4	38.7%		27.2%	14.3%	14.1%	5.7%	4,611
	3.4 to <3.8	42.4%		25.4%	11.0%	16.6%	4.6%	11,003
	3.8 to <4.2	42.8%		22.4%	8.2%	22.1%	4.5%	7,296
	4.2+	34.3%		19.7%	6.9%	32.5%	6.7%	554
	Unknown	39.8%		11.8%	20.4%	18.3%	9.7%	93
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	<3.4	66.7%	5.7%	10.8%	3.1%	9.4%	4.3%	351
	3.4 to <3.8	58.3%	10.4%	11.3%	5.3%	10.5%	4.3%	2,161
	3.8 to <4.2	53.1%	11.8%	10.6%	4.5%	16.7%	3.3%	13,418
	4.2+	49.2%	9.3%	11.7%	3.7%	23.0%	3.1%	5,204
	Unknown	51.6%	9.7%	8.6%	7.5%	12.9%	9.7%	93
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227
BK LA	<3.4	92.7%	0.9%	0.9%		5.5%		109
	3.4 to <3.8	87.2%	2.7%	1.0%	1.2%	5.7%	2.2%	405
	3.8 to <4.2	74.3%	5.4%	2.4%	1.4%	13.6%	3.0%	3,082
	4.2+	61.1%	6.8%	2.1%	0.9%	24.6%	4.6%	6,944
	Unknown	75.9%	1.9%			14.8%	7.4%	54
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<3.4	42.2%		25.5%	13.2%	13.6%	5.5%	5,071
	3.4 to <3.8	48.0%		22.4%	9.8%	15.3%	4.5%	13,569
	3.8 to <4.2	60.0%		13.1%	5.2%	17.9%	3.7%	23,796
	4.2+	62.6%		6.8%	2.3%	24.3%	4.1%	12,702
	Unknown	56.7%		7.9%	10.8%	15.4%	9.2%	240
	Total	56.0%		15.1%	6.4%	18.3%	4.1%	55,378

Table 15

Test score distribution by campus group

	<1500	1500 to <1800	1800 to <2100	2100+	Unknown	
1: MC RV SB SC	22.4%	40.3%	31.0%	5.5%	0.8%	100.0%
2: DV IR SD	10.5%	31.7%	40.3%	17.1%	0.5%	100.0%
3: BK LA	4.0%	17.6%	32.1%	46.2%	0.2%	100.0%
UC	14.3%	32.7%	34.8%	17.7%	0.6%	100.0%

Table 16

Enrollment choice by test score

		UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	<1500	41.4%		32.1%	13.2%	6.4%	7.0%	5,270
	1500 to <1800	43.3%		26.8%	11.4%	14.6%	4.0%	9,498
	1800 to <2100	40.2%		19.1%	8.9%	27.7%	4.0%	7,300
	2100+	40.9%		9.7%	4.7%	38.6%	6.1%	1,298
	Unknown	22.0%		27.8%	17.3%	20.4%	12.6%	191
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	<1500	58.8%	10.1%	15.9%	6.3%	4.7%	4.2%	2,229
	1500 to <1800	57.8%	12.1%	13.1%	5.4%	8.7%	2.9%	6,725
	1800 to <2100	51.5%	11.6%	10.1%	3.7%	20.0%	3.1%	8,553
	2100+	44.0%	7.9%	5.4%	2.5%	35.6%	4.7%	3,622
	Unknown	32.7%	5.1%	23.5%	13.3%	23.5%	2.0%	98
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227
BK LA	<1500	82.8%	6.9%	2.9%	2.4%	3.6%	1.4%	419
	1500 to <1800	79.5%	9.3%	2.6%	1.3%	5.9%	1.4%	1,864
	1800 to <2100	71.1%	6.7%	2.8%	1.3%	14.8%	3.3%	3,396
	2100+	56.6%	4.5%	1.4%	0.6%	31.3%	5.7%	4,895
	Unknown	85.0%				10.0%	5.0%	20
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<1500	51.7%		26.0%	10.7%	5.8%	5.9%	7,918
	1500 to <1800	57.9%		19.2%	8.1%	11.5%	3.3%	18,087
	1800 to <2100	57.0%		12.3%	5.3%	22.0%	3.5%	19,249
	2100+	55.0%		3.9%	1.8%	33.9%	5.4%	9,815
	Unknown	31.1%		24.6%	14.9%	20.7%	8.7%	309
	Total	56.0%		15.1%	6.4%	18.3%	4.2%	55,378

School-Level Characteristics

Academic metrics

Group 3 stands out from groups 1 and 2 in having a lower share of students from the high schools with the lowest A-G completion rates and a higher share from the schools with the highest rates. Across all three groups, the preference for UC, CSU, and CCC declines with increasing high school A-G completion rates.

Table 17

Distribution of high school-wide A-G completion rates, based on school rate in 2013-14

	<40%	40% to <60%	60% to <80%	80% to 100%	Unknown	
1: MC RV SB SC	20.8%	40.0%	26.2%	11.1%	2.0%	100.0%
2: DV IR SD	21.5%	39.6%	25.7%	11.2%	2.0%	100.0%
3: BK LA	18.5%	36.7%	29.0%	14.1%	1.6%	100.0%
UC	20.6%	39.2%	26.5%	11.7%	1.9%	100.0%

Table 18

Enrollment choice by school-wide A-G completion rate

		UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	<40%	44.0%		27.7%	13.0%	9.5%	5.7%	4,906
	40% to <60%	43.1%		26.3%	11.2%	15.2%	4.3%	9,395
	60% to <80%	39.6%		22.3%	9.4%	24.7%	4.1%	6,166
	80% to 100%	36.6%		18.2%	8.1%	30.6%	6.5%	2,621
	Unknown	41.4%		26.7%	10.0%	13.4%	8.5%	469
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	<40%	53.9%	13.6%	14.1%	5.9%	9.3%	3.2%	4,538
	40% to <60%	55.3%	11.2%	11.5%	4.3%	14.6%	3.0%	8,418
	60% to <80%	51.5%	9.5%	8.7%	3.5%	23.4%	3.4%	5,460
	80% to 100%	45.5%	8.3%	7.6%	3.3%	30.2%	5.0%	2,390
	Unknown	53.4%	9.3%	11.9%	6.2%	14.3%	5.0%	421
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227

		UC in group	Other UC	CSU	CCC	Other	No match	N
BK LA	<40%	70.2%	9.0%	3.7%	1.6%	12.4%	3.1%	1,957
	40% to <60%	68.4%	7.2%	2.2%	1.1%	17.3%	3.8%	3,891
	60% to <80%	64.3%	4.1%	1.4%	0.7%	25.1%	4.5%	3,081
	80% to 100%	59.7%	3.8%	0.9%	0.5%	30.2%	4.9%	1,492
	Unknown	71.1%	5.8%	4.0%	2.9%	15.0%	1.2%	173
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<40%	59.4%		18.2%	8.2%	9.9%	4.3%	11,401
	40% to <60%	58.0%		16.3%	6.7%	15.3%	3.7%	21,704
	60% to <80%	53.6%		12.9%	5.4%	24.3%	3.9%	14,707
	80% to 100%	49.1%		10.3%	4.6%	30.4%	5.6%	6,503
	Unknown	55.6%		17.1%	7.3%	14.0%	5.9%	1,063
	Total	56.0%		15.1%	6.4%	18.3%	4.1%	55,378

Socioeconomic status

Group 3 had a larger share of students from high schools with less than 25% students receiving free or reduced price meals (FRPM), but the other remaining categories were fairly similar, and not much variation can be seen between group 1 and group 2. Just as with A-G rates, but in the opposite direction, students coming from schools with increasing FRPM rates were more likely to choose UC, CSU, or CCC.

Table 19

Distribution of school-wide percent eligible for free or reduced price lunch, based on school rate in 2013-14

	<25%	25% to <50%	50% to <75%	75% to 100%	Unknown	Grand Total
1: MC RV SB SC	33.6%	23.8%	21.5%	20.2%	0.9%	100.0%
2: DV IR SD	33.2%	23.2%	20.7%	22.2%	0.7%	100.0%
3: BK LA	39.8%	21.4%	18.7%	19.5%	0.7%	100.0%
UC	34.6%	23.1%	20.7%	20.8%	0.8%	100.0%

Table 20

Enrollment choice by school-wide free/reduced price lunch rate

		UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	<25%	37.1%		19.8%	9.4%	29.6%	4.2%	7,918
	25% to <50%	42.9%		23.5%	11.2%	18.5%	3.9%	5,607
	50% to <75%	46.1%		26.3%	11.6%	11.7%	4.4%	5,056
	75% to 100%	42.7%		32.4%	11.5%	5.8%	7.5%	4,757
	Unknown	41.6%		24.7%	9.1%	16.4%	8.2%	219
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	<25%	47.5%	10.0%	8.0%	3.2%	27.6%	3.8%	7,065
	25% to <50%	51.5%	10.2%	11.6%	4.6%	19.1%	2.9%	4,920
	50% to <75%	57.3%	12.0%	12.5%	4.7%	11.4%	2.1%	4,383
	75% to 100%	58.4%	12.2%	12.9%	5.5%	6.4%	4.7%	4,710
	Unknown	52.3%	8.1%	12.8%	6.0%	16.1%	4.7%	149
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227
BK LA	<25%	63.1%	4.0%	1.2%	0.6%	26.8%	4.3%	4,212
	25% to <50%	65.2%	6.4%	2.6%	0.9%	20.8%	4.0%	2,266
	50% to <75%	68.8%	6.9%	2.5%	1.3%	17.0%	3.6%	1,982
	75% to 100%	71.6%	9.4%	2.9%	1.7%	10.7%	3.8%	2,057
	Unknown	76.6%	7.8%	2.6%	1.3%	11.7%		77
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<25%	51.2%		11.4%	5.2%	28.2%	4.0%	19,195
	25% to <50%	55.2%		15.2%	6.8%	19.2%	3.5%	12,793
	50% to <75%	60.1%		16.9%	7.2%	12.5%	3.4%	11,421
	75% to 100%	60.9%		19.2%	7.3%	6.9%	5.7%	11,524
	Unknown	55.3%		16.9%	6.7%	15.5%	5.6%	445
	Total	56.0%		15.1%	6.4%	18.3%	4.1%	55,378

The share of students from a charter school was the highest in group 1 and the lowest in group 2. Not much difference in institutional choice can be seen between students from a charter school and those from other public high schools.

Table 21

Share of admitted students coming from a charter school

	No	Yes	Grand Total
1: MC RV SB SC	92.7%	7.4%	100.0%
2: DV IR SD	93.2%	6.8%	100.0%
3: BK LA	93.0%	7.0%	100.0%
UC	92.9%	7.1%	100.0%

Table 22

Enrollment choice by charter high school status

	Charter School	UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	No	41%		25%	11%	18%	5%	21,826
	Yes	43%		23%	11%	16%	8%	1,731
	Total	42%		25%	11%	18%	5%	23,557
DV IR SD	No	53%	11%	11%	4%	18%	3%	19,780
	Yes	54%	10%	10%	5%	16%	4%	1,447
	Total	53%	11%	11%	4%	17%	3%	21,227
BK LA	No	66%	6%	2%	1%	21%	4%	9,856
	Yes	67%	6%	2%	1%	18%	5%	738
	Total	66%	6%	2%	1%	20%	4%	10,594
UC	No	56%		15%	6%	18%	4%	51,462
	Yes	56%		15%	7%	16%	6%	3,916
	Total	56%		15%	6%	18%	4%	55,378

Distance

For each student, three measures of distance in the higher education context were calculated. The first was the mean distance from the student's high school to the nearest three CCC campuses. The second was the mean distance from the student's high school to the nearest three CSU campuses. The third was the distance from the student's high school to the nearest UC that they were admitted to, among the UCs in the UC campus group under consideration.

Group 3 seems to show slightly more students from high schools nearer to CCCs and fewer from those further, which may be a reflection of those students coming from more

urbanized areas. As the distance to CCC increased, students were more likely to attend UC in group 1, whereas the opposite was true in groups 2 and 3. Somewhat surprisingly, the group with the largest CCC distance (20+ miles) also demonstrated more likelihood to attend CCC, which may also be due to a general lack of opportunities and resources in those regions.

Table 23

Distribution of high school distance to nearest 3 CCCs, in miles

	<10	10 to <15	15 to <20	20+	
1: MC RV SB SC	32.6%	32.5%	14.8%	20.1%	100.0%
2: DV IR SD	33.3%	31.6%	15.2%	19.9%	100.0%
3: BK LA	35.9%	30.9%	15.2%	18.1%	100.0%
UC	33.5%	31.8%	15.1%	19.6%	100.0%

Table 24

Enrollment choice by distance to CCC, in miles

		UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	<10	39.7%		25.6%	10.4%	18.3%	6.1%	7,675
	10 to <15	43.1%		23.4%	10.4%	19.0%	4.1%	7,652
	15 to <20	40.6%		25.2%	9.4%	21.2%	3.6%	3,494
	20+	43.0%		24.7%	12.8%	14.5%	5.1%	4,736
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	<10	55.4%	8.8%	9.4%	4.1%	17.8%	4.6%	7,065
	10 to <15	55.3%	10.8%	10.1%	3.7%	17.6%	2.6%	6,708
	15 to <20	48.9%	12.1%	12.6%	4.1%	19.2%	3.1%	3,236
	20+	47.9%	13.6%	13.4%	6.3%	15.6%	3.2%	4,218
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227
BK LA	<10	66.4%	5.2%	1.5%	0.8%	21.1%	5.0%	3,806
	10 to <15	67.2%	5.6%	1.8%	1.0%	21.1%	3.3%	3,270
	15 to <20	65.9%	7.5%	2.2%	0.8%	20.2%	3.4%	1,606
	20+	65.2%	7.7%	3.6%	1.7%	18.2%	3.6%	1,912
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<10	55.6%		14.5%	6.0%	18.7%	5.3%	18,546
	10 to <15	57.4%		14.3%	6.1%	18.8%	3.4%	17,630
	15 to <20	54.9%		15.9%	5.7%	20.2%	3.4%	8,336
	20+	55.4%		16.6%	8.3%	15.6%	4.1%	10,866
	<10	39.7%		25.6%	10.4%	18.3%	6.1%	55,378

The three UC campus groups were approximately comparable in looking at the distribution of distance to CSU. As the distance to CSU increased, students in groups 2 and 3 were more likely to attend UC, but this was not true for group 1. Group 1 students nearest to CSU (<20 miles) were more likely to attend CSU, but the group furthest away (60+ miles) also showed higher than average enrollment rates at CSU for groups 1, 2, and 3.

Greater variation is seen for the distance to UC, with students attending CSU or CCC tending to attend high school further from the admitted UC campus.

Table 25

Distribution of high school distance to nearest 3 CSUs, in miles

	<20	20 to <40	40 to <60	60+
1: MC RV SB SC	14.1%	46.7%	15.8%	23.4%
2: DV IR SD	15.0%	44.0%	16.0%	25.0%
3: BK LA	14.1%	48.3%	16.0%	21.5%
UC	14.5%	46.0%	15.9%	23.7%

Table 26

Enrollment choice by distance to CSU, in miles

		UC in group	Other UC	CSU	CCC	Other	No match	N
MC RV SB SC	<20	41.9%		30.6%	9.6%	12.4%	5.5%	3,324
	20 to <40	41.9%		21.4%	10.2%	21.5%	5.0%	11,007
	40 to <60	39.8%		23.6%	11.4%	21.2%	4.1%	3,712
	60+	42.0%		28.2%	12.1%	13.0%	4.7%	5,514
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557
DV IR SD	<20	60.9%	8.8%	11.4%	4.0%	11.3%	3.7%	3,191
	20 to <40	52.9%	10.8%	7.8%	3.8%	20.7%	3.9%	9,339
	40 to <60	48.7%	12.5%	11.5%	4.1%	20.3%	2.9%	3,395
	60+	50.7%	11.3%	15.6%	5.7%	13.8%	2.9%	5,302
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227

		UC in group	Other UC	CSU	CCC	Other	No match	N
BK LA	<20	69.4%	5.5%	1.5%	1.1%	18.1%	4.5%	1,497
	20 to <40	66.2%	4.4%	1.4%	0.7%	22.9%	4.5%	5,118
	40 to <60	66.8%	7.1%	1.7%	0.8%	20.5%	3.1%	1,699
	60+	64.5%	9.6%	4.5%	1.8%	16.4%	3.3%	2,280
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<20	59.1%		17.5%	5.8%	13.0%	4.6%	8,012
	20 to <40	55.7%		12.4%	5.9%	21.5%	4.5%	25,464
	40 to <60	54.6%		14.7%	6.5%	20.7%	3.4%	8,806
	60+	55.7%		19.0%	7.7%	13.9%	3.7%	13,096
	Total	56.0%		15.1%	6.4%	18.3%	4.2%	55,378

Students admitted to group 1 were more likely to come from the furthest group of high schools from those UC campuses (120+ miles), whereas students admitted to groups 2 and 3 were the most likely to come from the <40 mile group. In groups 1 and 2, the preference to attend UC declined as distance increased, but in group 3, it remained more constant.

Table 27

Distribution of high school distance to nearest UC admitted to in group, in miles

	<40	40 to <80	80 to <120	120+	
1: MC RV SB SC	22.3%	26.7%	15.0%	36.0%	100.0%
2: DV IR SD	35.2%	24.8%	11.7%	28.3%	100.0%
3: BK LA	41.8%	18.2%	9.5%	30.4%	100.0%
UC	38.7%	25.1%	11.8%	24.4%	100.0%

Table 28

Enrollment choice by distance to UC, in miles

		UC in group	Other UC	CSU	CCC	Other	No match	N
1: MC RV SB SC	<40	50.7%		21.8%	7.9%	16.1%	3.4%	5,262
	40 to <80	44.4%		24.0%	10.3%	16.0%	5.3%	6,293
	80 to <120	38.9%		26.2%	12.9%	18.0%	4.0%	3,531
	120+	34.9%		26.3%	11.9%	21.2%	5.8%	8,471
	Total	41.6%		24.7%	10.7%	18.2%	4.9%	23,557

		UC in group	Other UC	CSU	CCC	Other	No match	N
2: DV IR SD	<40	60.9%	10.0%	9.7%	3.6%	12.7%	3.1%	7,478
	40 to <80	54.5%	10.3%	9.7%	4.3%	17.8%	3.4%	5,263
	80 to <120	49.6%	10.0%	10.1%	4.0%	21.9%	4.4%	2,481
	120+	42.9%	12.9%	13.9%	5.6%	21.4%	3.4%	6,005
	Total	52.9%	10.9%	10.9%	4.4%	17.5%	3.4%	21,227
3: BK LA	<40	67.6%	4.3%	1.4%	0.9%	21.4%	4.6%	4,433
	40 to <80	65.0%	6.1%	2.2%	0.8%	21.8%	4.2%	1,926
	80 to <120	62.5%	8.7%	2.5%	1.4%	21.4%	3.6%	1,011
	120+	66.7%	7.8%	3.0%	1.2%	18.1%	3.2%	3,224
	Total	66.4%	6.1%	2.1%	1.0%	20.4%	4.0%	10,594
UC	<40	66.4%		10.0%	3.7%	16.4%	3.5%	21,437
	40 to <80	56.2%		15.4%	6.8%	17.4%	4.3%	13,918
	80 to <120	48.8%		18.6%	8.8%	19.6%	4.2%	6,533
	120+	42.7%		21.2%	9.2%	21.8%	5.1%	13,490
	Total	56.0%		15.1%	6.4%	18.3%	4.2%	55,378

Longitudinal analysis

Graduation Rates and Time-to-Degree

One of the research questions asks whether students who were admitted to UC have differing bachelor's graduation rates by the type of institution they initially attend. Overall, about two-thirds of the students who attended UC graduated in four years, ranging from 58 percent in group 1 to 76 percent in group 3. In comparison, about 40 percent of those who attended CSU and 22 percent of those who attended CCC graduated within four years. The other group had the highest overall 4-year graduation rate, at 71 percent, and unsurprisingly, only 14 percent of those who were not initially matched and found enrolling anywhere after UC admission graduated. Six-year graduation rates were higher, with graduation rates for the students admitted to any UC who attended UC, CSU, or other all above 80 percent. Even at six years, only 55 percent of those who initially chose CCC had graduated. Graduation rates were highest for students in group 3,

declining to group 2 and group 1. In all three groups, the other institution category had the highest graduation rates, followed by UC in group, then CSU, then CCC. Other UC graduation rates were higher than CSU for group 3 but lower than CSU for group 2. Initially attending a CCC was associated with in a substantial decline in the chances of graduation. Interestingly, group 2 students show a boost in graduation rates for attending a UC in group 1.

Table 29

Percent of 2014 cohort earning a bachelor's degree within 4 and 6 years

	UC in group	Other UC	CSU	CCC	Other	No Match	All
			Graduate in 4 years				
1: MC RV SB SC	58.3%		36.5%	18.8%	63.7%	9.3%	47.3%
2: DV IR SD	64.8%	67.9%	47.8%	27.7%	73.6%	14.3%	61.5%
3: BK LA	76.1%	74.1%	49.5%	43.0%	79.7%	28.0%	73.9%
UC	65.7%		40.0%	21.8%	70.7%	14.3%	57.8%
			Graduate in 6 years				
1: MC RV SB SC	79.6%		78.3%	52.6%	81.4%	20.9%	73.9%
2: DV IR SD	85.8%	85.0%	86.4%	60.3%	88.2%	22.7%	82.9%
3: BK LA	90.1%	89.8%	86.5%	66.4%	90.7%	33.6%	87.7%
UC	84.8%		80.8%	55.1%	85.8%	23.8%	80.0%

Defined as degrees earned prior to October 1, 2018 for four years and October 1, 2020 for six years.

The following table shows the time to degree by both campus group and enrollment choice. Groups 1 and 2 have larger increases in going from five to six years than group 3. CSU and CCC also display larger increases in the same time frame. This suggests that the overall graduation rates might continue to improve beyond six years, which could be a subject of future study. Six years was chosen as the cutoff for this study because it is a nationally accepted benchmark of graduation rates. Looking at mean years to graduation for those who graduated,

those who attended other institutions had the shortest time to degree, followed by UC, then no match, then CSU, then CCC.

Table 30

Distribution of years to degree, by campus group and enrollment choice

	<=3	<=3.5	<=4	<=4.5	<=5	<=5.5	<=6	Did not grad in 6		Mean years	Median years
Camp Group											
1: MC RV SB SC	1.8%	6.1%	47.3%	56.0%	67.6%	70.2%	73.9%	26.1%	100.0%	4.0	3.7
2: DV IR SD	2.8%	9.1%	61.5%	69.1%	79.0%	80.5%	82.9%	17.1%	100.0%	3.9	3.7
3: BK LA	2.9%	9.0%	73.9%	80.3%	85.7%	86.5%	87.7%	12.3%	100.0%	3.8	3.7
UC	2.4%	7.8%	57.8%	65.6%	75.5%	77.3%	80.0%	20.0%	100.0%	3.9	3.7
Enr. Choice											
UC in group	2.7%	9.3%	65.7%	73.7%	81.9%	83.2%	84.8%	15.2%	100.0%	3.9	3.7
Other UC	3.4%	10.8%	69.3%	76.7%	83.7%	84.6%	86.0%	14.0%	100.0%	3.8	3.7
CSU	1.6%	4.8%	40.0%	53.0%	71.5%	75.5%	80.8%	19.2%	100.0%	4.2	4.2
CCC	1.0%	2.7%	21.8%	28.1%	43.2%	47.6%	55.1%	44.9%	100.0%	4.4	4.5
Other	3.0%	9.1%	70.7%	75.7%	82.8%	83.8%	85.8%	14.2%	100.0%	3.8	3.6
No match	0.4%	1.2%	14.3%	16.2%	20.5%	21.3%	23.8%	76.2%	100.0%	4.1	3.7

Table 31

Distribution of years to degree, by campus group and enrollment choice, conditional on graduation in six years

	<=3	<=3.5	<=4	<=4.5	<=5	<=5.5	<=6
Campus Group							
1: MC RV SB SC	2.4%	8.3%	64.0%	75.8%	91.5%	95.0%	100%
2: DV IR SD	3.4%	11.0%	74.2%	83.4%	95.3%	97.1%	100%
3: BK LA	3.3%	10.3%	84.3%	91.6%	97.7%	98.6%	100%
UC	3.0%	9.8%	72.3%	82.0%	94.4%	96.6%	100%
Enr. Choice							
UC in group	3.2%	11.0%	77.5%	86.9%	96.6%	98.1%	100%
Other UC	4.0%	12.6%	80.6%	89.2%	97.3%	98.4%	100%
CSU	2.0%	5.9%	49.5%	65.6%	88.5%	93.4%	100%
CCC	1.8%	4.9%	39.6%	51.0%	78.4%	86.4%	100%
Other	3.5%	10.6%	82.4%	88.2%	96.5%	97.7%	100%
No match	1.7%	5.0%	60.1%	68.1%	86.1%	89.5%	100%

Model predicting CCC attendance

Given the large discrepancy between CCC graduation rates compared to the other groups, I next fit a logistic regression incorporating all of the predictor variables using CCC enrollment as the outcome variable, for UC as a whole and for each campus group. For simplicity of presentation, the following table only shows the direction and statistical significance of coefficients on the predictor variables, omitting those that were not statistically significant at the $p<0.05$ level. A positive (+) sign indicates the predictor is associated with greater propensity to attend CCC after controlling for other variables, and a negative sign (–) indicates a lesser propensity. Due to the smaller number of students choosing CCC in group two, and the extremely small number in group 3, very few results of statistical significance were obtained. The full set statistical coefficients and standard errors are presented in the Appendix.

For race/ethnicity, African American students were less likely than White students to choose CCC, while Asian and Non-Resident students were more likely. Only one level of parent education (some college) had a statistically significant and positive effect, and only for UC as a whole. Increasing family income was associated with a decreasing likelihood of CCC attendance, similar to what was found in the descriptive analysis. All the individual academic preparation variables also matched the descriptive analysis even after other controls were included in the model, with higher preparation leading to lower CCC enrollment. High school A-G rate also showed the same pattern, but interestingly, FRPM was in the opposite direction as expected and as shown in the descriptive analysis. Instead of higher FRPM predicting greater preference for CCC, it was associated with a declining preference. This may be due to FRPM being also correlated with other factors in the model such as income and academic preparation. Also counterintuitive was that higher high school quality, as measured by average UC applicant GPA,

was associated to increasing preference for CCC. More intuitively, further distance to UC and CSU was associated with student enrollment in CCC, even after controlling for other variables. No statistically significant results were found for gender, other race/ethnicity or parent education categories, or average HS test scores of UC applicants, which may likely be due to their correlation with other factors in the model. The pseudo r-squared values reported suggests that many other unobserved factors not in the model also play a role in selection for CCC attendance.

Table 32

Significant logistic regression results predicting CCC enrollment

	All	**Group 1: MC RV SB SC**	**Group 2: DV IR SD**	**Group 3: BK LA**
African American/Black (compared to White)	−***	−***		
Asian (compared to White)		+*		
Non-Resident (compared to White)	+**	+***		
Parent Ed: Some College (compared to HS and below)	+*			
Family Income	−**	−*		
High School GPA	−***	−***		
A-G Courses	−*			
Test Score	−***	−***	−**	
HS A-G Rate	−***	−***	−*	
HS FRPM Rate	−***	−**		
Avg HS GPA of UC Applicants	+***	+***		
Distance to UC	+***	+***	+**	
Distance to CSU	+***	+**	+*	
Distance to CCC		−*		
HS Charter School	+*			
Observations	49,573	9,310^	19,163	21,051
Pseudo R2	0.0638	0.0322	0.0220	0.0239

*** p<0.001, ** p<0.01, * p<0.05.

^ 49 observations dropped because CCC attendance is perfectly predicted by one of the values of the variables, making it mathematically impossible to estimate regression coefficients. In other

words, everyone with unknown gender or American Indian/Alaska Native or Native American/Pacific Islander ethnicity also did not attend CCC.

Empirical Modeling

To model the effects of the initial enrollment choice on the chances of earning a bachelor's degree within four and six years, I calculated logistic regression models. Six models were calculated that progressively incorporate additional variables along the contextual layers presented earlier.

Table 33

Logistic regression models

		Model					
Category	**Variables included**	**A**	**B**	**C**	**D**	**E**	**F**
Higher education context	Initial enrollment choice [6]	X	X	X	X	X	X
Demographic	Gender [3] Ethnicity [8]		X	X	X	X	X
Social/cultural capital and resources	Parent education [5] Family income			X	X	X	X
Academic preparation and achievement	High school GPA Test score, equated A-G courses completed				X	X	X
School and community context	High school A-G completion rate High school FRPM Mean HS GPA Mean HS test score Charter school status					X	X
Higher education context	Distance from HS to nearest UC in group Average distance from HS to nearest 3 CSU campuses Average distance from HS to nearest 3 CCC campuses						X

For the regression, "UC in group" was used as the reference against which these coefficients were calculated. Figure 5 shows the regression results represented as marginal effects. Marginal effects can be interpreted as exploring how the predicted probability of

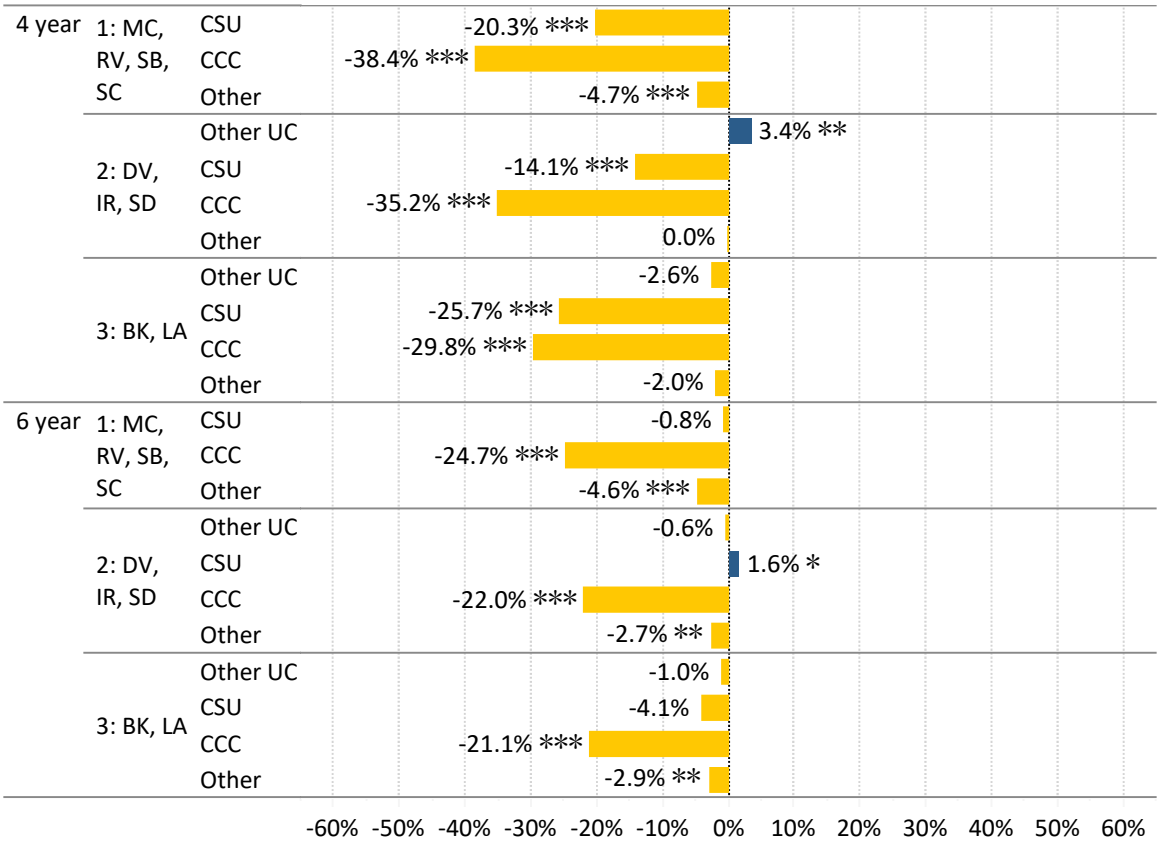
graduation changes as the variable of interest (in this case, college choice) changes, after controlling for the other variables in the model. While different calculations for marginal effects exist, here the average predicted probability is calculated for all students in the dataset by setting the enrollment choice to the specified choice of interest, calculating the predicted probability of graduation using the estimated regression coefficient for each remaining independent variable in the model per student, then averaging the result. The resulting probability is then contrasted against the reference group (UC in group) to calculate the results shown. The result can be interpreted as the predicted change in graduation rate (measured in percentage points), compared to attending a UC in group. If the marginal effect of attending a CCC is -0.25, this means that the model estimates that attending CCC would lower one's chance of graduating by 25 percentage points. The level of significance tests if the effect is significantly different from zero—in other words, if there is a statistically significant difference in the marginal effect between attending a UC in group compared to the choice shown. Further discussion of the methodology can be found in the research design section.

Figure 5 shows the marginal effects for only the full (complete) model where all the controls have been included. For example, reading from the top, students in group 1 (MC, RV, SB, SC) who attend CSU have a 20.3 percentage point lower chance of graduating in four years in this model that includes all the controls. Those who attended CCC had a graduation rate that was lower by 38.4 percentage points. The results show that attending another UC compared to UC in group had a significant positive effect at only at 4 years and only for group 2 (DV, IR, SD). Attending CSU was negatively associated with 4-year graduation for all groups, with group 3 seeing the largest effect and group 2 seeing the smallest effect. At six years, CSU attendees from group 2 gained a slight boost of less than 2 percentage points, while results were

statistically insignificant for other groups. Attending a CCC had large negative marginal effects across all three groups at both four and six years. The negative effect was largest for group 1 and smallest for group 3. Not attending a California public institution (the other group) had statistically significant negative effects at six years for all groups, but only for group 1 at four years. As expected, students who were not initially found attending any institution had a much lower chance of graduating, but those students are not shown in the graph; results can be found in the appendix.

Figure 5

Difference in marginal effect compared to UC in group, full model (F) only

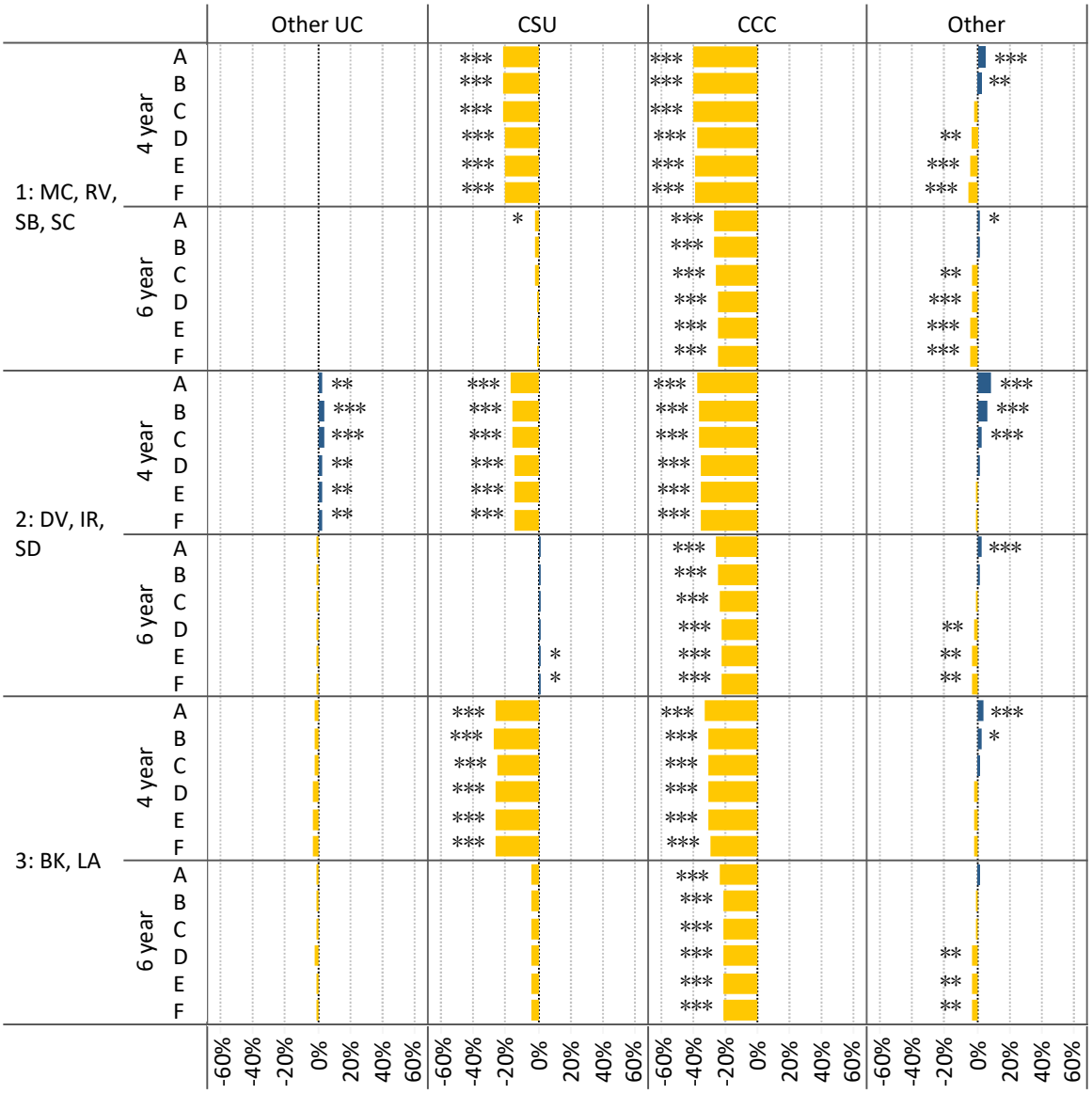


*** p<0.001, ** p<0.01, * p<0.05

Figure 6 shows the marginal effects and significance for each of the models. Generally, the marginal effect is seen to decline as variables are added to the model; however, in some of the groups in the other category, the effect is observed to change sign. The negative association of CCC attendance with graduation rates at both four and six years, and the negative association with CSU attendance on rates at four years dominate the figure. This is true even after all the controls in the model have been added, and especially visible in the 4-year graduation models.

Figure 6

Difference in marginal effect compared to UC in group



*** p<0.001, ** p<0.01, * p<0.05

In conclusion, the main findings of interest are the relationship between CCC attendance and lower 4- and 6-year graduation rates, and a similar relationship between CSU attendance and lower 4-year graduation rates, even after controlling for individual and school-level factors. Also

of interest is the shift in the association with attending an “other” institution from positive in the base model with no factors to negative once all the controls were taken into account.

CHAPTER FIVE

DISCUSSION

Review of the Study

This study posed two research questions. The first asked what factors are associated with the initial enrollment choice of freshmen admitted to UC. The second asked how that choice of enrollment is associated with a student's probability of graduating with a bachelor's degree within four and six years.

Prior to addressing the first research question, a key unexpected finding was the large variation seen in the choice of CSU and especially CCC enrollment by UC campus and campus group, with students admitted to the least selective UC campuses over ten times as likely to attend CCC as those admitted to the most selective group. This may be explained by a number of hypotheses. Students may have wanted to attend a more selective UC in the beginning, and feel that the transfer pathway could grant that second chance. Students who lack the academic preparation to be admitted into more-selective UCs may be more likely to also lack other types of capital, agency, or confidence needed to navigate things such as applying for financial aid or securing housing that are unnecessary for CCC enrollment. The lack of resources and capital may also mean that unexpected shocks, such as personal or family financial or health setbacks, are less easily weathered, and deter students from the full-time, in-person model that UC, unlike CCC, is structured around.

The descriptive results to the first research question were in line with the extant research. Generally, students from minoritized (non-White) backgrounds were more likely to attend any of the three California public institution options. It may be that White students feel more comfortable attending out-of-state institutions that tend to have lower shares of minoritized

students compared to California public institutions, or that they are more successful at securing enrollment at these institutions due to legacy admissions or other racial inequities in the admissions processes. White students were also generally more likely to choose CSU or CCC over UC compared to students of color. This corroborates other findings that students of color are more likely to choose institutions of higher selectivity, perhaps because of a perceived additional value of education as opening doors or providing credentials and access toward greater social capital.

Hispanic/Latinx students were more likely than Asian or African American students to "trade down" in institution quality as assessed by overall six-year graduation rates. In other words, Hispanic/Latinx students are more likely to turn down Berkeley or UCLA for one of the other UC's, and to turn down Davis, Irvine, or San Diego for the UC institutions with the lowest graduation rates. Furthermore, they are more likely to turn down any UC for a CSU or CCC, which have even lower graduation rates on average. While the top CSU campuses have comparable graduation rates to the lowest UC campuses, CSU campuses that have similar selectivity (as measured by SAT scores) to the least selective UC campuses have lower graduation rates than those UC campuses (Bleemer, 2021a). This is in line with the empirical findings of Kurlaender (2006) that Latino students were more likely than their peers to begin at community college, and invites further study into the role of social capital in access as addressed by González, Stoner, and Jovel (2003).

Family income, parent education, academic preparation all followed the same general pattern. Increasing levels of each of these were associated with lower likelihood of students enrolling in UC, CSU, or CCC. This is consistent with the idea that students with more capital, whether economic, cultural, or social, will have additional possibilities. They apply to more

institutions (Hoxby & Avery, 2012), can more easily navigate admissions processes, and can attain acceptance to more institutions with greater academic preparation. At the high school level, the patterns were analogous. With decreasing shares of students eligible for free/reduced price lunch came decreasing preference for UC, CSU, and CCC, and the same was true for increasing A-G completion rates and average test scores. Charter school status showed no clear patterns, and distance to CCC, CSU or UC also showed mixed results.

For the second research question, findings show that students admitted to UC generally experience high six-year graduation rates regardless of where they choose to enroll, with the exception of CCC. The first finding of interest is that after controlling for context, there is only a miniscule, statistically non-significant difference in completion at six years between those who attend the more selective and less selective UC campuses, for those who were admitted to both. In other words, the observed graduation rate differences among UC campuses may be more of a function of student background rather than value added by the institution. Likewise, the differences in graduation rates at six years for students choosing CSU were quite small and non-significant or marginally-significant once controlling for background. This suggests that pre-college academic preparation, as measured by a student's acceptance to UC, bodes well for future academic success. The finding that fairly large differences exist in CSU enrollees at four years but are largely gone by six deserve more research; structural factors may be at work.

As far as the large differences seen in CCC graduation rates, there are undoubtedly unobserved factors affecting both selection into CCC as well as graduation rates. These findings call for additional qualitative follow-up with students who select CCC to find out the reasons for the choice.

Limitations and Options for Further Research

Missing Variables and Data Quality

Aside from non-quantitative factors, several data limitations are present in this study. Self-reported data can suffer from various biases, including not understanding what is being asked or deliberately misrepresenting oneself. In the case of race/ethnicity, confusion may exist around the federally mandated questions and categories, and despite the fact that UC does not consider it in admissions, applicants may believe that disclosing or not disclosing may provide an advantage in the process. Family income and parent education are other areas where applicants may not fully understand their situation, or desire to misrepresent themselves to obtain an advantage. Unfortunately, FAFSA data were not available for this analysis for both technical and student privacy reasons. Also for privacy reasons, the student's high school address was used instead of their home address. This may lead to bias both in rural areas where students live a long distance from their school and in large urban that offer busing, charter, or specialty high schools a distance away from the student's home. A-G courses, GPA, and test scores, although self-reported, are likely of better quality because the student knows these are subject to verification and transcript analysis.

The data relied on degrees and award dates as reported to the National Student Clearinghouse. A small number of NSC records indicated that a student had earned some kind of degree, award or certificate, but the degree name was missing, likely due to incorrect reporting by the institution. This could result in underestimation of graduation rates, leading to bias if one type of institution is worse at reporting. Another limitation is the reliance on the date of degree awarded as reported to NSC. Though institutions run on different schedules, such as semester or quarter, for the purposes of this research one cutoff date had to be picked for the purposes of

standardization. This differs from 4-year or 6-year graduation rates that are reported publicly according to federal definitions, because in that case each institution is able to make its own calculation as to the cutoff of four or six years from initial enrollment.

Insufficient Detail and Oversimplification

This study attempted but ultimately discarded information about the major to which a student applied at UC, which would be interesting to pursue with further research. If a particular major may lead to higher earnings, a student may choose a less-selective school where they are able to undertake study in that major (Dale & Krueger, 2002). An analysis by major was complicated by a standardized list of major across campuses and the large share (at least a third) of students who apply undeclared. Moreover, the role a student's major plays in admission is difficult to observe from this researcher's perspective. Certain majors may reside in entirely different colleges (such as a college of Chemistry or Engineering) and thus the major is paramount in the admission's decision, whereas many are just part of a general college of Letters and Sciences. Also unobservable is any information about the student's preferences and choice set when it comes to major, or what kind of major the student initially chose when attending a non-UC campus.

Further research might also explore the use of a longer time-to-graduation, particularly for community college students who might be attending part-time or moving among multiple institutions. While there are valid policy reasons to encourage timely graduation, such as loss of earnings and higher fixed costs, students might also be legitimately choosing a longer path, and in that case the result of a longer time to degree cannot be considered a "penalty".

The institutional groupings used in this study are coarse and do not offer the opportunity to distinguish among the diversity of UC campuses, CSU campuses, CCC institutions, and

especially the "other" category. Although individual campuses were present in the data, it would also have greatly complicated the analysis and interpretation, especially since information about which of these campuses were available or under consideration by the student was not available for this analysis. A more sophisticated analysis could take into account the choice set available to students by using which UC campuses they applied to and were accepted to.

Statistical Validity

The results appear to show a large penalty to community college attendance for otherwise well-qualified students who choose to begin their education there. The model undoubtedly suffers from endogeneity. One can easily imagine a number of situations that would affect both college choice and graduation rates. For example, a student might face a family or health situation that would lead them to enroll at a CCC that is closer to home and offers part-time attendance options. Such a situation would likely impact graduation rates as well. As another example, while family income is part of the model, it does not capture situations such as debt or shocks after the application is submitted such as loss of income or addition of family members to support.

Potential Shortcomings

By accounting for background factors that affect choice, this study explores if institutional factors are associated with college outcomes. While using application and admission as signals limits and clarifies the scope of the study, it also ignores additional factors. Some students may "aim too high" in the college admissions process, leading them to be denied and end up attending a community college even though they may have been admitted at a four-year institution. Others may be well-qualified and prepared but present themselves poorly on the application. All applicants are subject to the stochasticity of the admissions process—if they had

applied on another day, perhaps assigned to another reader, the outcomes may have been different.

Situating the Research and the Researcher

Generally, little thought is given to positionality in quantitative research. The potential for bias is very present, however, even with seemingly "objective" methodologies used in quantitative research.

For this research, I acknowledge that my position as a researcher in the University of California system office gives me little exposure to actual student stories or experiences. Villenas (1996) points out three ways in which the ethnographer acts as a colonizer of the researched: "By objectifying the subjectivities of the researched, by assuming authority, and by not questioning their own privileged positions." This critique can apply not just to ethnographers but to the quantitative research here. The power of data to generalize can also be the power to objectify, gloss over and ignore nuance. The notion of reducing a person to a set of measured figures itself is problematic. This sort of quantitative research does not involve consent or even acknowledgement—the students are anonymous, unwitting participants, without any say in how they are interpreted and analyzed.

Quantitative research can cast a sort of authority that deteriorates under further scrutiny. As Hurtado and colleagues point out, one cannot claim to hold everything equal in order to control for or isolate the effects of characteristics, given the reality of how they work together and appear in tandem (Hurtado et al., 1997). For example, results that say race plays no effect if controlling for family income and wealth and parental education ignores how those things are shaped by race. Or, as Kim points out, even a neutral finding that a particular policy has no effect

on African Americans and Latinx students must be viewed in the context of how it had a positive effect on Asian American and White students (Kim, 2004).

Quantitative research, though used here and the most common approach I employ in my work context, is only part of the story. Mixed methods needs to be present in the institutional researcher's toolkit (Laanan & Jain, 2016). For example, a finding of differences among groups might be interesting, but without a qualitative component, it is hard to make sense of the meaning (Teranishi et al., 2004).

Policy Relevance and Suggestions for Future Research

Structure growth in transfer pathways to minimize diversion from UC to CCC

Given the finding of lower graduation rates for UC admits who start at CCC, plans for growing the transfer pathway need to consider to what extent they are democratizing access instead of diverting promising students. This study addresses the "diversion" dimension of the CCC debate, as the students in this study were all admitted to first or second tier research universities with some choosing to enroll in community colleges. Policies keeping new freshman enrollment static while growing transfer enrollment can very well result in diversion as long as demand continues to increase from demographic factors, increasing academic achievement, and a growing "college for all" culture. In the decades since the inception of the Master Plan, when college enrollment in California was about equally divided between 2-year and 4-year institutions, 2-year enrollment has expanded far more, even after accounting for growth in vocational and non-credit programs (Geiser & Atkinson, 2013). Since 2013, when the cohort under study applied, academic preparation and institutional selectivity has also continued to climb at UC institutions with demand growing faster than supply, especially at the more-selective UC campuses. Admissions to CSU has also grown more selective, with higher GPA

cutoffs for many popular majors and even several entire campuses (Reddy & Ryan, 2021). While it is true that the students in the study were all admitted to UC and thus not diverted from a lack of capacity, students with similar academic preparation today may very well find themselves denied admission due to growing selectivity and plateauing capacity. This is compounded by the finding that students with lower levels of academic preparation, admitted to the less selective UCs, are more likely to choose CCC. In other words, these are students more likely to be on the margins of admissions, and as standards rise, they may find themselves shut out.

Reduce potential barriers diverting students into community colleges

While this research does not attempt to identify any causal reasons for selecting into community college, previous research has identified numerous factors that are worth examining, given the finding that students who start at community college have a lower chance of earning a bachelor's in six years. The patterns found in the descriptive and regression analyses are telling: decreasing socioeconomic status and academic preparation are both associated with greater likelihood to choose CCC. This suggests that there may be a host of information barriers at play for students from lower socioeconomic backgrounds or less resourced high schools that may influence college choice.

Financial aid policies are worth examining, both in terms of the complexity of applying for and obtaining aid and the amount of aid provided. Given that low-income students and students from under-resourced high schools may stand to benefit the most from attending and graduating from selective institutions (Black et al., 2020); it is unfortunate that these students are more likely to end up in CCC. As discussed in the literature review, financial aid policies amounts can be quite influential on influencing college attendance. Simplifying the application process, increasing aid amounts, and reducing uncertainty through policies such as 4-year aid

guarantees or cohort-based tuition may be of value for students that select CCC for financial reasons.

Students may face unexpected personal shocks or have particular circumstances that divert them into CCC. UC undergraduate programs are designed around full-time, in-person synchronous experiences, which can be difficult for parents, working students, students with health issues, and others. This is in contrast to CCC, which offers both part-time and asynchronous online options. While the UC model may be partly responsible for its higher graduation rates, students for whom their obstacles are temporary may benefit from deferment after admission. UC policies regarding deferral of admissions range from campus to campus. For example, UC Berkeley, UC San Diego, and UCLA all state that requests for deferrals are rarely approved (*FAQs | Office of Undergraduate Admissions*, n.d.); (*Frequently Asked Questions*, n.d.); (*Accepting Your Offer of Admission — Freshmen*, n.d.). While deferments present challenges for enrollment planning, viewing the characteristics of students who decline UC for CCC through a socioeconomic equity lens may motivate examination and reconsideration of these policies and further research into whether they could provide a beneficial alternative to attending CCC.

Relevance to students

The results from this research suggests that students should carefully consider whether turning down UC for a CCC will be the best for their educational goals. As mentioned, one motivation for choosing the CCC pathway may be to eventually earn a bachelor's degree from a more-selective and thus prestigious UC campus or major compared to the campus admitted to as a freshman. This is in line with the "second chance" idea of the transfer pathway. This research

is unable to identify students with these motives, so it cannot be stated whether there is any penalty to them, but it is worth exploring in future research.

The finding that UC graduation rates plateau more quickly than those of UC admits who attend CSU seems to mirror overall CSU graduation rates, which more than double between four years and six years (*Graduation Rates and Degrees Earned*, 2020). While graduation rates are nearly equal at six years, the CSU entrants are more likely to take more than four years, which may represent an added cost to the student in tuition and fees and lost earnings.

Also worth further study is the finding that the other institution category, which seems to be beneficial in boosting graduation rates, turns out to have the opposite effect after controlling for the background variables in the research. It is hard to say anything conclusive about this category since it acts as a catch-all, but further research could disaggregate it and explore the results.

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APPENDIX

Table 34

Institutional enrollment choice of admitted freshmen

		Institution of enrollment						
		Same UC	Other UC	CSU	CCC	Other	No Match	Total
Campus admitted to	Any UC	25%	37%	10%	6%	19%	3%	120,054
	Berkeley (BK)	52%	17%	2%	1%	24%	4%	6,217
	Davis (DV)	25%	41%	7%	4%	20%	3%	15,840
	Irvine (IR)	25%	45%	8%	5%	15%	3%	16,900
	Los Angeles (LA)	46%	23%	2%	1%	25%	4%	7,959
	Merced (MC)	14%	28%	23%	17%	13%	4%	9,540
	Riverside (RV)	22%	34%	17%	10%	14%	3%	16,552
	San Diego (SD)	23%	43%	5%	3%	23%	3%	14,102
	Santa Barbara (SB)	22%	43%	8%	5%	20%	3%	16,767
	Santa Cruz (SC)	19%	37%	14%	8%	19%	3%	16,177

Note. Students admitted to multiple campuses are counted multiple times in the "Any UC" row. The unduplicated counts are in Table 3.

Table 35

Logistic regression model of initial CCC attendance

VARIABLES	UC	BK	DV	MC
African American/Black	-0.696***	-1.108	-0.440	-0.551***
	(0.140)	(1.043)	(0.309)	(0.160)
American Indian/Alaska Native	-0.185	Omitted	-0.374	0.124
	(0.436)		(1.032)	(0.489)
Asian	0.0356	-0.117	-0.148	0.140*
	(0.0562)	(0.305)	(0.105)	(0.0690)
Hispanic/Latino	-0.0660	0.0348	-0.0212	-0.0330
	(0.0604)	(0.334)	(0.114)	(0.0731)
Native Hawaiian/Other Pacific Islander	0.110	Omitted	0.363	0.128
	(0.259)		(0.474)	(0.305)
Non-Resident	0.259**	-0.247	0.291	0.407***
	(0.100)	(0.573)	(0.196)	(0.121)

VARIABLES	UC	BK	DV	MC
Two Or More Races	-0.0732	-0.244	-0.107	-0.0228
	(0.0944)	(0.549)	(0.178)	(0.114)
Unknown Race/Ethnicity	0.0351	-0.439	0.0619	0.0985
	(0.188)	(1.030)	(0.325)	(0.241)
Female	-0.0155	0.0219	0.127	-0.0427
	(0.0387)	(0.216)	(0.0758)	(0.0464)
Unknown Gender	0.542	Omitted	1.617	0.277
	(0.469)		(0.856)	(0.571)
Parent Ed: Some College	0.134*	-0.243	0.185	0.0903
	(0.0546)	(0.338)	(0.105)	(0.0655)
Parent Ed: 4-year graduate	0.115	-0.134	0.174	0.0376
	(0.0590)	(0.334)	(0.114)	(0.0708)
Parent Ed: Postgraduate Study	-0.114	-0.548	-0.119	-0.128
	(0.0698)	(0.383)	(0.135)	(0.0832)
Family Income	-6.45e-07**	1.28e-07	-4.25e-07	-7.80e-07*
	(2.47e-07)	(1.09e-06)	(4.66e-07)	(3.06e-07)
High School GPA	-1.237***	0.120	-0.277	-0.737***
	(0.0612)	(0.590)	(0.174)	(0.0812)
A-G Courses	-0.00784*	0.00905	0.00437	-0.00744
	(0.00354)	(0.0187)	(0.00665)	(0.00435)
Test Score	-0.00118***	-0.000217	-0.000728**	-0.000712***
	(0.000111)	(0.000676)	(0.000225)	(0.000137)
HS A-G Rate	-0.873***	-0.587	-0.627*	-0.935***
	(0.136)	(0.763)	(0.257)	(0.167)
HS FRPM Rate	-0.509***	0.321	-0.178	-0.586**
	(0.150)	(0.845)	(0.292)	(0.180)
Avg HS GPA of UC Applicants	0.868***	-0.406	0.476	0.850***
	(0.204)	(1.054)	(0.379)	(0.252)
Avg Test Score of UC Applicants	-1.76e-05	-0.000527	-0.000416	-0.000319
	(0.000246)	(0.00140)	(0.000483)	(0.000296)
Distance to UC	0.00135***	0.00111	0.000784**	0.00102***
	(0.000157)	(0.000764)	(0.000248)	(0.000190)
Distance to CCC	-0.00354	0.00356	-0.00182	-0.00579*
	(0.00217)	(0.0110)	(0.00385)	(0.00275)
Distance to CSU	0.00384***	0.00487	0.00486*	0.00369**
	(0.00105)	(0.00566)	(0.00191)	(0.00130)
HS Charter School	0.163*	-0.118	0.177	0.173
	(0.0805)	(0.473)	(0.152)	(0.0977)
Constant	1.613*	-2.545	-2.058	-0.0664
	(0.780)	(4.436)	(1.498)	(0.974)
Observations	49,573	9,310	19,163	21,051
Pseudo R^2	0.0638	0.0322	0.0220	0.0239

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 36

Logistic regression outcomes: Merced/Riverside/Santa Barbara/Santa Cruz

	A	B	C	D	E	F
Outcome: Graduate in six years						
CSU	-0.0800*	-0.0768	-0.0813	-0.0258	-0.0504	-0.0504
	(0.0405)	(0.0411)	(0.0425)	(0.0434)	(0.0444)	(0.0446)
CCC	-1.259***	-1.288***	-1.288***	-1.226***	-1.274***	-1.274***
	(0.0471)	(0.0479)	(0.0498)	(0.0508)	(0.0520)	(0.0522)
Other	0.109*	0.0120	-0.167**	-0.203***	-0.286***	-0.288***
	(0.0466)	(0.0477)	(0.0514)	(0.0525)	(0.0537)	(0.0539)
No match	-2.698***	-2.700***	-2.742***	-2.752***	-2.749***	-2.749***
	(0.0769)	(0.0780)	(0.0824)	(0.0841)	(0.0855)	(0.0855)
Pseudo R^2	0.0851	0.104	0.109	0.121	0.131	0.131
Outcome: Graduate in four years						
CSU	-0.887***	-0.922***	-0.930***	-0.877***	-0.910***	-0.909***
	(0.0341)	(0.0348)	(0.0363)	(0.0370)	(0.0378)	(0.0379)
CCC	-1.798***	-1.855***	-1.875***	-1.819***	-1.863***	-1.861***
	(0.0549)	(0.0558)	(0.0581)	(0.0591)	(0.0601)	(0.0602)
Other	0.230***	0.110**	-0.0818	-0.142**	-0.208***	-0.211***
	(0.0378)	(0.0390)	(0.0425)	(0.0436)	(0.0445)	(0.0447)
No match	-2.606***	-2.631***	-2.724***	-2.732***	-2.725***	-2.726***
	(0.104)	(0.105)	(0.112)	(0.113)	(0.114)	(0.114)
Pseudo R2	0.0888	0.112	0.120	0.136	0.145	0.146
Observations	23,557	23,557	21,767	21,497	21,058	21,051

*** p<0.001, ** p<0.01, * p<0.05 "UC in group" attendance is treated as the reference group.

Standard errors in parentheses. Pseudo R-squared reported is McFadden (1974).

Table 37

Marginal effects: Merced/Riverside/Santa Barbara/Santa Cruz

	Outcome: Graduate in six years					
	A	B	C	D	E	F
CSU	-0.0133*	-0.0124	-0.0128	-0.00398	-0.00755	-0.00755
	(0.00677)	(0.00665)	(0.00676)	(0.00670)	(0.00669)	(0.00672)
CCC	-0.270***	-0.268***	-0.262***	-0.243***	-0.247***	-0.247***
	(0.0107)	(0.0106)	(0.0108)	(0.0108)	(0.0108)	(0.0109)
Other	0.0172*	0.00189	-0.0269**	-0.0328***	-0.0456***	-0.0459***
	(0.00721)	(0.00748)	(0.00849)	(0.00870)	(0.00883)	(0.00887)
No match	-0.588***	-0.576***	-0.577***	-0.570***	-0.561***	-0.561***
	(0.0127)	(0.0131)	(0.0137)	(0.0140)	(0.0145)	(0.0145)
	Outcome: Graduate in four years					
CSU	-0.218***	-0.218***	-0.217***	-0.199***	-0.204***	-0.203***
	(0.00805)	(0.00793)	(0.00816)	(0.00820)	(0.00823)	(0.00826)
CCC	-0.395***	-0.396***	-0.397***	-0.379***	-0.384***	-0.384***
	(0.00923)	(0.00919)	(0.00955)	(0.00989)	(0.00996)	(0.00999)
Other	0.0546***	0.0256**	-0.0189	-0.0320**	-0.0463***	-0.0469***
	(0.00888)	(0.00899)	(0.00983)	(0.00986)	(0.00989)	(0.00993)
No match	-0.489***	-0.488***	-0.496***	-0.489***	-0.490***	-0.490***
	(0.00993)	(0.0103)	(0.0106)	(0.0108)	(0.0113)	(0.0113)

*** p<0.001, ** p<0.01, * p<0.05

"UC in group" attendance is treated as the reference group.

Standard errors in parentheses. Pseudo R-squared reported is McFadden (1974).

Table 38

Logistic regression outcomes: Davis/Irvine/San Diego

	A	B	C	D	E	F
	Outcome: Graduate in six years					
Other UC	-0.0626	-0.00424	-0.00601	-0.0515	-0.0597	-0.0554
	(0.0641)	(0.0657)	(0.0680)	(0.0689)	(0.0706)	(0.0708)
CSU	0.0541	0.120	0.0941	0.126	0.144*	0.153*
	(0.0664)	(0.0679)	(0.0695)	(0.0710)	(0.0732)	(0.0734)
CCC	-1.375***	-1.380***	-1.373***	-1.375***	-1.413***	-1.404***
	(0.0723)	(0.0747)	(0.0781)	(0.0801)	(0.0824)	(0.0827)
Other	0.214***	0.105	-0.0581	-0.196**	-0.232***	-0.229***
	(0.0576)	(0.0591)	(0.0636)	(0.0661)	(0.0679)	(0.0682)
No match	-3.023***	-3.070***	-3.188***	-3.321***	-3.349***	-3.347***
	(0.0926)	(0.0950)	(0.103)	(0.106)	(0.108)	(0.108)
Pseudo R^2	0.0881	0.121	0.129	0.148	0.164	0.164
	Outcome: Graduate in four years					
Other UC	0.138**	0.199***	0.192***	0.168**	0.173**	0.176**
	(0.0487)	(0.0504)	(0.0524)	(0.0532)	(0.0543)	(0.0544)
CSU	-0.701***	-0.685***	-0.705***	-0.687***	-0.674***	-0.662***
	(0.0460)	(0.0479)	(0.0497)	(0.0508)	(0.0518)	(0.0520)
CCC	-1.571***	-1.607***	-1.642***	-1.655***	-1.666***	-1.657***
	(0.0760)	(0.0779)	(0.0818)	(0.0838)	(0.0853)	(0.0854)
Other	0.412***	0.319***	0.168***	0.0299	-0.000524	-0.00151
	(0.0421)	(0.0436)	(0.0472)	(0.0489)	(0.0499)	(0.0501)
No match	-2.403***	-2.419***	-2.518***	-2.632***	-2.635***	-2.637***
	(0.108)	(0.109)	(0.117)	(0.119)	(0.121)	(0.121)
Pseudo R^2	0.0581	0.0930	0.105	0.124	0.135	0.136
Observations	21,227	21,227	19,743	19,565	19,173	19,163

"UC in group" attendance is treated as the reference group.

Standard errors in parentheses. Pseudo R-squared reported is McFadden (1974).

*** p<0.001, ** p<0.01, * p<0.05

Table 39

Marginal effects: Davis/Irvine/San Diego

	A	B	C	D	E	F
	Outcome: Graduate in six years					
Other UC	-0.00782	-0.000503	-0.000699	-0.00584	-0.00655	-0.00607
	(0.00812)	(0.00780)	(0.00792)	(0.00788)	(0.00783)	(0.00784)
CSU	0.00649	0.0137	0.0106	0.0135	0.0148*	0.0157*
	(0.00785)	(0.00752)	(0.00766)	(0.00739)	(0.00730)	(0.00730)
CCC	-0.254***	-0.241***	-0.233***	-0.222***	-0.222***	-0.220***
	(0.0164)	(0.0159)	(0.0161)	(0.0158)	(0.0158)	(0.0159)
Other	0.0242***	0.0120	-0.00687	-0.0232**	-0.0268**	-0.0265**
	(0.00624)	(0.00663)	(0.00760)	(0.00810)	(0.00816)	(0.00819)
No match	-0.631***	-0.614***	-0.623***	-0.629***	-0.622***	-0.622***
	(0.0159)	(0.0164)	(0.0170)	(0.0168)	(0.0174)	(0.0174)
	Outcome: Graduate in four years					
Other UC	0.0309**	0.0418***	0.0395***	0.0334**	0.0336**	0.0341**
	(0.0107)	(0.0104)	(0.0106)	(0.0104)	(0.0104)	(0.0104)
CSU	-0.171***	-0.158***	-0.159***	-0.149***	-0.143***	-0.141***
	(0.0113)	(0.0112)	(0.0113)	(0.0112)	(0.0112)	(0.0113)
CCC	-0.371***	-0.363***	-0.363***	-0.357***	-0.354***	-0.352***
	(0.0154)	(0.0154)	(0.0159)	(0.0162)	(0.0164)	(0.0165)
Other	0.0874***	0.0657***	0.0347***	0.00606	-0.000104	-0.000301
	(0.00853)	(0.00874)	(0.00963)	(0.00990)	(0.00993)	(0.00998)
No match	-0.505***	-0.495***	-0.502***	-0.510***	-0.507***	-0.507***
	(0.0137)	(0.0144)	(0.0148)	(0.0145)	(0.0150)	(0.0150)

"UC in group" attendance is treated as the reference group.

Standard errors in parentheses. Pseudo R-squared reported is McFadden (1974).

*** p<0.001, ** p<0.01, * p<0.05

Table 40

Logistic regression outcomes: Berkeley/Los Angeles

	Outcome: Graduate in six years					
	A	B	C	D	E	F
Other UC	-0.0347	-0.0230	-0.0267	-0.146	-0.124	-0.117
	(0.136)	(0.137)	(0.140)	(0.142)	(0.144)	(0.144)
CSU	-0.355	-0.384	-0.383	-0.476*	-0.441*	-0.437*
	(0.200)	(0.203)	(0.207)	(0.209)	(0.214)	(0.215)
CCC	-1.532***	-1.469***	-1.464***	-1.526***	-1.584***	-1.570***
	(0.208)	(0.214)	(0.220)	(0.224)	(0.229)	(0.229)
Other	0.0679	-0.00177	-0.0706	-0.293**	-0.331***	-0.329***
	(0.0842)	(0.0856)	(0.0924)	(0.0982)	(0.0995)	(0.0996)
No match	-2.890***	-2.993***	-3.040***	-3.273***	-3.307***	-3.307***
	(0.111)	(0.113)	(0.123)	(0.129)	(0.131)	(0.131)
Pseudo R^2	0.0971	0.119	0.118	0.136	0.148	0.148
	Outcome: Graduate in four years					
Other UC	-0.108	-0.0993	-0.0934	-0.180	-0.162	-0.151
	(0.0939)	(0.0958)	(0.0980)	(0.0996)	(0.101)	(0.101)
CSU	-1.176***	-1.238***	-1.171***	-1.250***	-1.270***	-1.261***
	(0.137)	(0.140)	(0.144)	(0.146)	(0.149)	(0.150)
CCC	-1.440***	-1.409***	-1.402***	-1.460***	-1.456***	-1.440***
	(0.197)	(0.202)	(0.209)	(0.212)	(0.218)	(0.219)
Other	0.212***	0.152*	0.113	-0.103	-0.117	-0.116
	(0.0603)	(0.0617)	(0.0671)	(0.0708)	(0.0717)	(0.0718)
No match	-2.104***	-2.191***	-2.262***	-2.482***	-2.490***	-2.491***
	(0.112)	(0.114)	(0.125)	(0.128)	(0.129)	(0.129)
Pseudo R^2	0.0453	0.0736	0.0786	0.0948	0.102	0.103
Observations	10,594	10,594	9,583	9,524	9,364	9,359

"UC in group" attendance is treated as the reference group.

Standard errors in parentheses. Pseudo R-squared reported is McFadden (1974).

*** p<0.001, ** p<0.01, * p<0.05

Table 41

Marginal effects: Berkeley/Los Angeles

	Outcome: Graduate in six years					
	A	B	C	D	E	F
Other UC	-0.00313	-0.00201	-0.00232	-0.0124	-0.0102	-0.00961
	(0.0124)	(0.0121)	(0.0122)	(0.0126)	(0.0123)	(0.0123)
CSU	-0.0364	-0.0386	-0.0381	-0.0459	-0.0409	-0.0405
	(0.0232)	(0.0231)	(0.0234)	(0.0235)	(0.0228)	(0.0228)
CCC	-0.238***	-0.214***	-0.210***	-0.209***	-0.214***	-0.211***
	(0.0458)	(0.0435)	(0.0442)	(0.0431)	(0.0438)	(0.0437)
Other	0.00588	-0.000154	-0.00624	-0.0264**	-0.0295**	-0.0293**
	(0.00718)	(0.00742)	(0.00829)	(0.00939)	(0.00947)	(0.00948)
No match	-0.565***	-0.565***	-0.570***	-0.595***	-0.591***	-0.591***
	(0.0233)	(0.0230)	(0.0246)	(0.0239)	(0.0241)	(0.0241)
	Outcome: Graduate in four years					
Other UC	-0.0201	-0.0178	-0.0166	-0.0311	-0.0274	-0.0256
	(0.0180)	(0.0175)	(0.0177)	(0.0177)	(0.0176)	(0.0176)
CSU	-0.265***	-0.268***	-0.250***	-0.258***	-0.259***	-0.257***
	(0.0339)	(0.0333)	(0.0338)	(0.0334)	(0.0338)	(0.0340)
CCC	-0.331***	-0.309***	-0.304***	-0.306***	-0.302***	-0.298***
	(0.0481)	(0.0480)	(0.0491)	(0.0488)	(0.0498)	(0.0499)
Other	0.0363***	0.0256*	0.0192	-0.0174	-0.0196	-0.0195
	(0.0100)	(0.0102)	(0.0112)	(0.0121)	(0.0122)	(0.0122)
No match	-0.481***	-0.482***	-0.491***	-0.522***	-0.520***	-0.519***
	(0.0224)	(0.0222)	(0.0234)	(0.0224)	(0.0225)	(0.0226)

"UC in group" attendance is treated as the reference group.

Standard errors in parentheses. Pseudo R-squared reported is McFadden (1974).

*** p<0.001, ** p<0.01, * p<0.05