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Geography of Opportunity for Transfer: Exploring the Spatial Contexts Surrounding Students at Sunshine Community College

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Geography of Opportunity for Transfer: Exploring the Spatial Contexts Surrounding Students at Sunshine Community College

A dissertation submitted in partial satisfaction of the

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in Education

by

Diana Delatour Lopez

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ABSTRACT OF THE DISSERTATION

Geography of Opportunity for Transfer: Exploring the Spatial Contexts Surrounding Students at Sunshine Community College

by

Diana Delatour Lopez

Doctor of Philosophy in Education

University of California, Los Angeles, 2023

Professor Cecilia Rios-Aguilar, Chair

While residents of Los Angeles County appear to have access to seemingly endless postsecondary opportunities within their proximity, the geography of opportunity for accessible options of higher education leading to bachelor's degrees in the area requires further exploration. This case study explores the spatial contexts and 3-year transfer successes of students attending Sunshine Community College (SCC). Spatial quantitative methods and Geographic Information Systems (GIS) software are used to combine Census American Community Survey (ACS) data on educational attainment with student-level data from the institution and the characteristics of surrounding institutions of higher education from IPEDS to explore the relationship between transfer completion and the geography of college opportunity for community college students. An index was calculated to represent the geography of college opportunity (GCO) surrounding each

student within their 5-mile spatial contexts and descriptive and inferential analyses run to inform our understanding of the concept of geography of opportunity and its relation to community college transfer. Several variables calculated in the creation of the GCO Index show a statistically significant negative weak relationship with transfer. For instance, students who are surrounded by fewer institutions of higher education have higher 3-year transfer rates and students who have more institutions of higher education in their vicinity have lower transfer rates. The inclusion of for-profit institutions help account for such findings and, as such, recommendations for future research considerations include exercising caution when including for-profit institutions in the analysis of geography of college opportunity. The results of this study will inform ways to better support students in their persistence toward overall educational goals of transfer and degree attainment and to enhance support structures for students from a range of spatial contexts seeking timely and cost-effective completion outcomes.

Keywords: community college students, geography of college opportunity, transfer, spatial contexts, GIS

The dissertation of Diana Delatour Lopez is approved.

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To Sophia

I applied to this program when you were just a dream,
I finish this dissertation with you in my arms

May your many angels – near and far –
surround you with light as you find your path in this world, my love

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VITA

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CHAPTER 1: INTRODUCTION

As we drove up the hill with the car packed to the brim with anything that might help me create a home away from home, a familiar song from my childhood started playing on the radio:

> There are places I remember / All my life, though some have changed / Some forever not for better / Some have gone and some remain… Though I know I'll never lose affection / For people and things that went before / I know I'll often stop and think about them / In my life, I love you more

In mere seconds, The Beatles (1965) broke down the facade of bravery I had built up since the day I learned I was admitted to my dream school with the condition that I attend a summer bridge program following high school graduation. The few friends of mine who were admitted directly to a four-year college would start later in the fall. I would move away from home at just seventeen years of age, months shy of officially becoming an adult. Most of my peers had plans to work part-time and attend the local community college while living at home – aiming to transfer within two years. A few would enroll in community colleges outside of the area in the hopes of transferring to specific institutions of interest.

I felt so fortunate to be admitted to UC Santa Cruz. The two other universities I applied to–which I naively considered back-ups with my limited college knowledge–offered swift rejections. I was so eager to be encouraged to think critically and to be challenged academically after years of attending a high school where college prep courses were of poor quality and the few students from my graduating class who were eligible to attend bachelor's granting institutions did not necessarily apply during junior year or matriculate following high school graduation. With few counselors available to guide us in what could have been years of preparation for college, the next step for most of my peers would be community college with the

expectation of an affordable path to a bachelor's degree. Despite my wonderful experiences with our local college up until that point, I did not get the sense that it would provide the college experience I so longed for – or that attending for two years would, indeed, lead to transfer.

Growing up with a community college just a few miles away had its benefits. I attended an adjacent preschool led by practitioners studying child development at the college. I was able to learn pottery and ballet folklórico through summer classes and workshops that helped me express my creativity through culturally relevant arts. I saw my friends act in plays put on by the performing arts program and I visited the planetarium on class field trips to gain a better understanding of the universe. I gathered with the community at the track for the annual Relay for Life. When I needed to repeat a course in high school, I was able to retake it at the local college over the summer, likely contributing to both my case for college readiness and the increase in self-esteem that comes from passing one's first college class.

I eagerly awaited the day I could begin my college education. I was fortunate enough to have a teacher early on who respected and cared for us enough to have high expectations and teach us critical thinking skills. As a result, I knew that there was more to education than what I was experiencing, and I became convinced that the place to get the education I yearned for was a University of California campus. Counselors, peers, teachers, and parents tempered expectations – if 4-year college admission did not come through we could always attend community college for two years and transfer. However, a mere 1.8% of those who started at the local community college that year would transfer within two years and only 7.3% would transfer within three years (CCC Data Mart).

As much as I was ready for the next level of education, I was not eager to leave home. UC Santa Cruz was the closest University of California campus at 45 minutes by car and it felt a

world away. Yet, it was close enough that I could hitch a ride home on the weekends or shop for study snacks in bulk at the local Costco during periodic family visits. It was close enough that during the year my father commuted into town for work we were able to meet occasionally for dinner. It was close enough so there was no question whether I would make it home for each holiday. I was fortunate to have access to a research university, where I could gain the skills I wanted and needed, without completely disconnecting from my sense of home and community.

However, as argued in *Moving Up Without Losing Your Way: The Ethical Costs of Upward Mobility* (Morton, 2019), some of us must choose between postsecondary education and our communities – the ones that sustain us and the ones that we sustain. Others do not need to weigh such a trade off – the educational and career opportunities that follow are available in our backyards or perhaps we are not part of communities that sustain or rely on us. Either way, we may believe that to learn and grow we need to experience that which is outside of our immediate vicinity. There was always a concern from my college counselors that I would go home almost every weekend. But I couldn't really see doing it any other way. It would not have been worth doing any other way given my values at that stage in life. A few of my peers lived at home and commuted to UCSC. I couldn't really see doing that either given that I didn't have a driver's license and because I had started to create that home away from home – not because of the things in the car, but because of the people I connected with and the relationships with friends that would grow stronger as we struggled and grew together.

I was ultimately able to get that college experience that so many transfer hopefuls dream of when they enter a community college, and it changed my life. A more nuanced understanding of the spatial contexts from which students successfully transfer from community college could help identify areas of intervention and further research to support more students in achieving

transfer in the future. This dissertation explores the geography of opportunity for transfer for students attending a community college in Los Angeles County. The following section provides relevant background of the community college system in the United States, and California in particular, in order to set the foundation for the study.

Background

Students from a range of backgrounds and spatial contexts attend community colleges. As of Fall 2018, two-year public colleges accounted for the enrollment of approximately 1 in 3 first-time degree or certificate-seeking students in the United States[1] (U.S. Department of Education, National Center for Education Statistics, 2022, Table 305.10). Many are post-traditional students who attend part-time (66%), are over 22 years of age (43%), identify as Hispanic (27%) or Black (12%), and balance academic pursuits with work and/or family commitments (AACC, 2023). Their paths through college are often not as linear as the common narrative of a "traditional" college student who moves directly from high school to a bachelor's granting institution. For example, some students "swirl" through higher education, attending multiple institutions as they pursue a bachelor's degree (i.e., McCormick, 2003; Goldrick-Rab, 2006).

Approximately 2.1 million students enrolled in the California Community College (CCC) system in 2018-19 (Launch Board). During the same academic year, over half of community college students in California (58.4%) indicated an academic goal of graduating with a two and/or four-year degree and one in four students with such goals (25.4%) attended institutions in

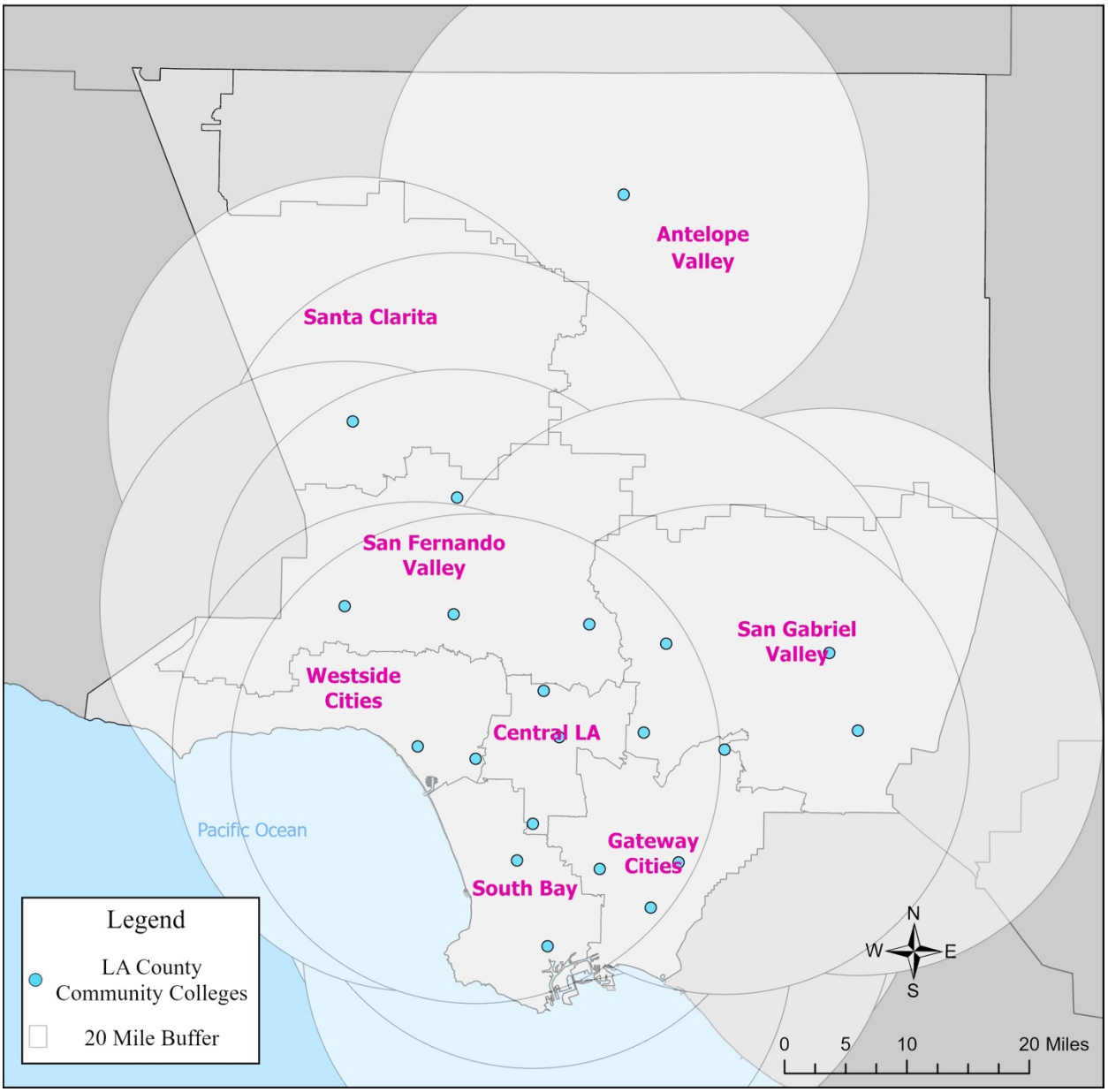
[1] An even greater proportion attend community colleges - this percentage is likely to be higher when accounting for those community colleges which offer one or more bachelor's degrees.

the Los Angeles area[2] (Launch Board). California residents are not restricted to attend the community college in closest proximity to their home though most community college students (79%) attend college within 20 miles of home (Sponsler & Hillman, 2016), making Los Angeles County an interesting case with most areas having seemingly proximal access to at least a few community colleges within a 20-mile radius (see Figure 1).

[2] Defined here as the California Community College Chancellor's Office (CCCCO) "microregion" of Los Angeles

Figure 1

Los Angeles County Community Colleges - 20 Mile Radius



Data Source: NCES Integrated Postsecondary Education Data System (IPEDS), 2013

However, even traveling a few miles in the LA area can take a significant amount of time depending on the time of day, the flow of traffic, work and family responsibilities, access to various modes of transportation, and a number of other factors. Nevertheless, students may take classes at various campuses given the geographic clustering of institutions or even travel out of their way to attend colleges which offer the programs needed to achieve their educational and professional goals.

While the precise designation has varied throughout the years, “junior”, “city”, and “community” colleges in California have a history dating back to the early 1900s (Brint & Karabel, 1989). In 1960, the California Master Plan for higher education outlined the distinct purposes of the state systems of higher education with junior colleges providing broad access to vocational training and lower division education “through but not beyond the fourteenth grade level” (California State Department of Education, 1960). These functions were distinct from the more exclusive and otherwise focused California State University (CSU) and University of California (UC) campuses. Though the initial framing of institutions as junior colleges linked them linguistically to universities which would in theory provide the advanced years of college instruction for transfer students, the shift to the term community college signaled a broader purpose that the institutions served beyond a path to a four-year degree (Brint & Karabel, 1989).

In recent years, the Vision for Success put forward by CCC Chancellor Eloy Ortiz Oakley acknowledged the critical role of California Community Colleges in transfer and access to bachelor’s degrees. “Our system of public higher education was explicitly designed for most degree-seeking students to get their start at a CCC, making the transfer process between CCCs and public universities critically important to the overall output of the broader California system”

(CCCCO, 2017, pg. 4). Indeed, the state needs to produce more college graduates for the growing economy and changing landscape (Johnson et al., 2015).

However, what are still often referred to as "two-year" institutions are only in rare instances providing a path to transfer within two years' time. As an example, we turn to data derived from the CCC Data Mart which reports the number of students who transfer to a four-year institution. In order to calculate the transfer rate for a given year, the transfer cohort includes only those students showing "behavioral intent to transfer [as] first-time college students with a minimum of 12 units earned who attempted a transfer level math or English course" (Data Mart, Transfer Cohort Methodology). By this calculation, a mere 2.6% of the 2013-14 entering cohort transferred to a four-year institution within two years while 39.6% transferred within six years of their initial enrollment at a California Community College (Data Mart, 2023). While the 2-year transfer rate might be concerning to both students aspiring to pursue an efficient pathway to transfer and to policy makers interested in increasing bachelor's degree attainment in the state, 3-6 year transfer rates are more often cited in part due to the high proportion of students who attend community colleges part-time. Indeed, this study focuses on students transferring within three years because it is the more relevant metric given that it is unreasonable to expect students to transfer within two years while attending part-time, as so many do. Yet, the spatial contexts surrounding efficient pathways to transfer within three years are worth exploring even in their rarity (10.2% across the system in 2013, Data Mart, 2023), given the potential benefits to both the individual students and the surrounding economy.

With two in five students transferring within six years, policy changes were clearly warranted in order to support the aspirations and educational attainment of students who attended CCCs. While students at broad access institutions should certainly be supported in degree

completion and transfer within the time frame that is right for them, there are real consequences to completing the degree within longer periods of time. As noted in the Vision for Success:

> Because students come to the CCCs with a variety of educational goals and life circumstances, there is no specific timeframe for completion that is appropriate for every student. Still, the system-wide average is considerably longer than the two-year timeframe for degrees and transfer preparation that was expected by the architects of the system and is still envisioned by many students and their parents today. When students stay in community college for many years, they delay their entry into the workforce and miss out on income, both in the short term and over the course of their lifetimes (CCCCO, 2017, pg. 10).

There are also financial aid implications for students who take several years to complete their associate's degree and rely on financial aid to pursue a bachelor's degree. For instance, the Federal Pell Grant has a maximum of the equivalent of six years of funding which can be a concern for students who attend multiple institutions and take years to transfer to a four-year institution (Campbell et al., 2015). But students often encounter barriers to transfer – for instance, not being able to enroll in the classes needed whether the enrollment is impacted or restricted due to placement requirements (CCCCO, 2017). Fortunately, many recent policy changes in recent years have started to address these issues. AB 705 cleared the way for many students to enroll directly in college-level coursework which could ease a path to transfer if they passed the equivalent class in high school (Campaign for College Opportunity, 2019). Four-year institutions have also developed transfer agreements, guaranteeing admission to students who complete certain requirements.

Rationale for Study

In the midst of such reforms, we lack a sufficient understanding of the educational paths and spatial contexts of students who manage, against the odds, to transfer to a four-year institution within three years. This study focuses on transfer within three years among the 2013 entering cohort at a community college with above average transfer and completion rates. Specifically, we look at the geographical contexts and opportunities for higher education access available to students within their proximity.

We need to better understand the educational paths and spatial contexts of students who transfer from California Community Colleges. As a crucial part of the nation's economy, the state needs to enable the attainment of college degrees for its diverse population. In fact, the governor has pushed the University of California to ease the path to transfer (State of California, 2023) and the Chancellor of the CCC system has advocated for increased completion through his Vision for Success (CCCCO, 2017). Approximately 7 in 10 students in the system are from "diverse ethnic backgrounds" (CCCCO, 2023). So, if we are looking to diversify and further educate the workforce, one key area of focus is understanding and supporting CCC students' paths to efficient transfer. In light of this, we need to develop a better understanding of students who have successfully transferred within three years.

Furthermore, recent research has called for increased attention to spatial inequality in higher education in general (Hillman & Weichman, 2016; Hillman, 2017; Rios-Aguilar & Titus, 2018) and for community college students in particular (Reyes et al., 2019; Rios-Aguilar et al., 2018). The intersection of the transfer and spatial inequities is in need of further exploration. This study will contribute to existing literature by exploring the local accessibility of college or "geography of college opportunity" in Los Angeles County and zooming in on the spatial

contexts of students attending one community college for a more detailed understanding of the backgrounds and surrounding educational opportunities associated with three-year transfer success.

This research ultimately seeks to uncover ways to better support students in their persistence toward overall educational goals and, more specifically, toward timely and cost-effective degree attainment. There is a need to understand the contexts of students who successfully transferred within three years. My contribution will be to explore the geography of opportunity for transfer within Los Angeles County using the case of a cohort of students from one community college - integrating regional context, institutional data, and national data to inform future institutional efforts to facilitate 3-year transfer in the future. Gaining a better understanding of the transfer success of community college students could also help inform efforts to increase the number of college graduates in California.

Understanding community college students in more depth could be helpful for 2-year and 4-year sector practitioners as they seek to create and sustain environments that work well for the students they seek to serve, as well as administrators and policymakers who may better structure the system to support diverse students who are interested in pursuing higher education. As the field seeks to understand college choice and college access in depth, we often miss the important spatial contexts within which students make decisions regarding whether and how to attend college. We need to consider the spatial contexts in order to obtain a more complete picture of the various dimensions in the college decision making processes for students who attend community college. While students appear to have many options for college attendance in the Los Angeles area, the geography of opportunity and accessibility to these options may be inequitably distributed. Therefore, an exploration of the geography of college opportunity for

transfer is needed to consider what students in Los Angeles really have access to and the contexts of students who are able to transfer successfully within three years' time.

Research Questions

This study explores the contexts of students who successfully transferred within three years from a community college in Los Angeles County in order to develop a more nuanced understanding of geography of college opportunity and inform efforts to increase transfer velocity in California. As such, this study investigates the following research questions:

1. What is the geography of college opportunity that surrounds students who transfer within 3 years?
2. Is there a relationship between geography of college opportunity and 3-year transfer?
    a. To what extent does 3-year transfer success vary by local access to higher education?
    b. To what extent does 3-year transfer success vary by closeness to Sunshine Community College (SCC)?

In alignment with the case study approach, exploring the questions above will help inform how 3-year transfer success from a community college with an above average transfer rate can shed light on the concept of geography of college opportunity.

The following chapter reviews the literature related to this topic, identifies more precisely the gap in the research that this dissertation will fill, and outlines the conceptual and theoretical frameworks that ground this research.

CHAPTER 2: LITERATURE AND FRAMEWORKS

Foundational to this study are the two relatively disconnected research areas of community college students and geography of opportunity. This chapter includes a review of the literature on each topic and highlights a few emerging studies at their intersection. I ultimately argue that, given extant literature, exploring the relationship between transfer success and the local educational opportunity surrounding community college students is a novel contribution to the field.

Literature

Decisions to Attend Community College, Student Aspirations, and Persistence to Outcome

This section outlines foundational literature regarding community college choice, student aspirations, and persistence to outcome which helped inform our research questions.

The literature on college choice explores various stages of the process including whether and how decisions are made to pursue a college education in the first place (e.g., McDonough, 1997; Cabrera & La Nasa, 2000; Grodsky & Riegle-Crumb, 2010), how prospective students decide where to apply (e.g., Perna & Titus, 2005; Pérez & McDonough, 2008), what is important to them (e.g., Iloh & Tierney, 2014), and the institution they ultimately attend (e.g., Cox, 2016). Such research is vital to our understanding of the individual and structural processes surrounding entry into higher education, a long-held avenue for social mobility in the United States (Romano & Eddy, 2017). In addition, several models exist for explaining college choice (e.g., Hossler & Gallagher, 1987; Perna, 2006) and college persistence (e.g., Milem & Berger, 1997). However, many models of college choice do not account for the lived experiences of low-income and/or underrepresented students (Cox, 2016). Of relevance to this research topic, students may make the choice to attend college and the choice of where to attend several times throughout the years

that follow high school (Cox, 2016), often attending higher education in non-linear ways (Goldrick-Rab, 2006).

In contribution to the rich body of literature on college choice, some scholars have encouraged the field of higher education to consider the processes of students whose experiences are not reflected in prevalent models of college choice (e.g., Cox, 2016). Such arguments are especially relevant during a time when the "traditional" college student is no longer the norm (Deil-Amen, 2015). Scholars (e.g., Jepsen & Montgomery, 2009) have problematized the notion of college choice as it relates to "non-traditional" students who may experience more geographically constrained options than many models suggest. The decision of where to attend is all but made for students who have personal and external constraints or are otherwise rooted in their communities (Hillman, 2016).

Next, we consider how post-traditional students decide to attend community college, complicating the notion that all students have a choice among endless possibilities. Following that, we turn to the literature on the role of aspirations in college choice and the types of institutions community college students would like to attend. In this section, we explore the role of staying close to home in this choice process for students who are rooted in their communities. The literature shows that the option to choose between colleges is a privilege not extended to the majority of students who ultimately attend community college and there are many sociospatial contextual factors which contribute to students' sense of spatial imagination as they consider possibilities for college attendance.

Decisions to Attend Community College

Post-traditional students have a range of considerations when they choose whether to attend college and where. Ranging from financial affordability, proximity to home, where they

think they can meet their academic and career goals, what will help them meet long and short-term goals, they have a range of considerations. There are some themes that have emerged from the literature, however. First, the decision whether or not to attend is one that students may make in conjunction with their perceived options for example, in the case of undocumented students (Pérez, 2010). This can be impacted by those around them that help shape the sense of possibilities (Martinez, 2012). Next, financial considerations are high on the list of things people consider when thinking about where to attend college. This links to geography because many post-traditional students have jobs, some of which pay the bills, help pay for school as job training, or need to be held on to for other non-academic reasons – they are the priority and need to remain the priority for some students and are often not flexible geographically. Finally, among the reasons for post-traditional students to attend community college are their family commitments (e.g., caregiver, supporting in other ways). Students will need to balance all of these commitments in order to successfully navigate their academic lives. As will be explored in more detail in the conceptual framework section, it is a big ask for some students to go "away" to college, even for those who do not go too far in terms of distance but add another large commitment to those areas that already require quite a bit of time and attention.

Community College Student Aspirations

There is a wide body of research that explores how college aspirations develop. However, for the purposes of this study, I will focus on the research that considers the role of college proximity. Most California community college students are interested in obtaining a degree (Launch Board). Therefore, the college choice process may be iterative where students decide to attend a particular community college until they can transfer to another institution. Many of these students want to attend college locally and are interested in pursuing what is perceived as a more

affordable option (Somers et al., 2006). Community colleges are available to many students locally, enabling them to enroll while keeping their jobs and meeting family commitments, for example. Students may have weighed their "options" including those of local for-profit colleges and online colleges and decided this was their best choice (Iloh & Tierney, 2014). We must also consider their geography of opportunity and how that may help shape their sense of possibility. Some students with colleges in proximity want to attend close to home, whatever that might mean for them given their access to efficient and affordable transportation.

Summary

Many students seek a college education within close proximity to home (Jepsen & Montgomery, 2009; Lee & Pirog, 2023). Some may have had the option to attend a four-year college directly but chose to stay close or even go far to attend a community college as a strategy for transfer (Park & Assalone, 2019). In the exploration of the geography of opportunity and transfer success of community college students, it is important to inform research efforts with the background on college choice because many community college students experience this in ways not accounted for and this foundation helps ground research surrounding those whose initial aspirations and continuously developing aspirations may contribute to their transfer interest.

Geography of Opportunity in Education

For decades, scholars in various fields and disciplines including public health, sociology, and political science have researched the role of geography, space, and/or place as it relates to structures of opportunity (Tate, 2008). In more recent history, the field of education was encouraged to take note of the importance of this area of study following Tate's (2008) American Educational Research Association (AERA) presidential address where he argued that

education scholars should seek to understand the ways in which geography influences opportunity. Geography of opportunity as a concept "suggests that where individuals live affects their opportunities and life outcomes" (Rosenbaum, 1995, p. 231). Indeed, since 2008 the field of education has seen various efforts to uncover geographical inequities, from research on school choice and charter schools (Bell, 2009; Heing, 2009), to rich descriptions of the opportunity within a community including education as one component (Fernandez, et al., 2013; Tate & Jones, 2017).

Scholars have used a range of approaches to study geography of opportunity, and much has been learned throughout the years of research in this area. Notably, in his asset-based research on two "low-opportunity" Detroit neighborhoods, Green (2015) encourages researchers to simultaneously engage geography of opportunity and opportunity in geography in order to achieve the parallel goals of identifying spaces of inequity and identifying the strengths within a community. Green (2015) both appreciates research which focuses on uncovering systemic inequities and cautions against studies that make recommendations which hold up a white, middle-class, suburban lifestyle as the American standard. On the contrary, it is the conditions that provide for the structures of opportunity that should be improved for equity and, together with research that identifies community assets, scholars can more clearly identify areas for movement on social justice (Green, 2015). While this is clearly a fine line to walk, the overall point is well taken: we must find ways to identify underlying sociospatial inequities in education with an end goal of making recommendations that can move the needle on rectifying identified inequalities.

Spatial, geographical, and place-based research in higher education has expanded within the last decade. Turley (2009) examined the role of college proximity in college going and found

a relationship between the number of colleges within proximity to home and the likelihood of a student applying to college. In addition, among their findings on research regarding the relationship between selective college applications and college proximity to home, Griffith & Rothstein (2009) found a positive relationship between distance to the closest two-year institution and applications to a four-year institution.

Hillman (2016) took studying proximity in college access a step further in his national analysis of institutions of higher education within commuting zones and the identification of college education "deserts" with differences in proximal access by race/ethnicity and educational attainment. In a follow-up paper for the American Council on Education (ACE), Hillman & Weichman (2016) argue that place matters, especially for post-traditional students and point to the importance of community colleges in education deserts as a sector that enrolls "over half of all students who live in education deserts" (p. 10). In addition, Sponsler & Hillman (2016) highlight the inequalities that persist as policy efforts focus on increasing college knowledge so that students may find the best fit in their decision making process while, in reality, most choices are constrained to geographically accessible institutions of higher education. They report that nationally 79% of those who attend community colleges and 53% of students attending public four-year institutions "enroll within just 20 miles from home" (Sponsler & Hillman, 2016, p. 2). With the vast majority of community college students enrolling within close proximity to home, this research has the potential to contribute to our understanding of the role of geography of college opportunity in relation to transfer as students are likely to be attending from what they consider home in contrast to what we might see for students attending a 4-year residential university away from home.

Emphasis on the need to conduct spatial research in higher education is evident in recent years. In 2017, Hillman published a chapter which outlined how higher education researchers could utilize geospatial analysis to better understand the college choice processes that "place-bound" students face. He concludes his argument that researchers would be wise to engage in such research by stating "Geography can be destiny for students, where opportunities may be widely available in some communities and few (or nonexistent) in others" (Hillman, 2017, p. 566).

In a recent special issue on spatial research specific to the field of higher education, Rios-Aguilar & Titus (2018) encourage the field to consider new ways of using "spatial lenses, technologies, and analyses (SLT&A)" to examine inequities, especially as they relate to marginalized student populations. Indeed, when discussing the geography of opportunity for students in higher education we cannot neglect to consider the connection between where students attend, how they attend college, and where they see themselves in the future in relation to their career aspirations. There are implications for the opportunities that exist for them within their geographic regions if they intend to continue living in the same community following graduation. Rios-Aguilar et al. (2018) outline a spatial research agenda for community colleges to identify mismatches between the local labor market and credentials and how such inconsistencies may contribute to further inequities for students by race/ethnicity. In addition, Reyes et al. (2019) consider the ways students attend community college in Houston in relation to the local labor market and their aspirations.

Geography of opportunity, spatial research, sociospatial lenses, and critical geography are employed throughout educational research to learn more about the connection between space and opportunity. To add to the existing literature, this study explores the Los Angeles County context

to see how institutions and surrounding social structures can better support degree completion of community college students. Taking a spatial quantitative exploratory approach which integrates local context for each student and institutional data will help shed light on our understanding of the geography of college opportunity.

Theoretical and Conceptual Frameworks

Critical Geographic College Access

Particularly relevant to the proposed study is Dache-Gerbino's (2018) Critical Geographic College Access (CGCA) framework which "combines critical geographic theories such as power geometry and spatial mismatch together to understand local college proximity for urban residents" (p. 98). Dache-Gerbino (2018) draws upon prior research and theory by Turley (2009) and Soja (1989), among others, outlining a framework which builds upon critical geographic principles and college access proximity research. She applies the CGCA framework to a study which analyzes American Community Survey and IPEDS data using various spatial statistical analyses and ultimately highlights college deserts and college oases within the sociohistorically situated context of the City of Rochester, New York and the surrounding Monroe County (Dache-Gerbino, 2018).

The CGCA framework informs this study by providing a model for considering college access and choice beyond proximity analysis alone. While the field has benefited from proximity studies which illuminate the connection between local college availability and both the decision to attend college and the decision to attend a college close to home (e.g., Turley, 2009), Dache-Gerbino (2018) argues for the benefit of additional layers of context and criticality in such

research. In this study, student contexts will be defined not by pre-defined geographies–such as neighborhoods, cities, or counties–but by the 5-mile radius that surrounds them.

Ethical Costs of College Attendance

Morton's (2019) research on strivers - first-generation and/or low-income students who seek a path out of the economic circumstances to which they were born - illuminates the ethical costs endured by students in their pursuit of upward mobility. Distinct from the non-ethical costs that students are typically expected to endure (i.e., forgo short-term fun at a party for long-term gains provided by a college degree), ethical goods and, conversely, the costs associated with the loss of these goods, are characterized by those which are "particular" and "not easily replaced" (i.e., a relationship with a close family friend) (Morton, 2019, p. 25). The narratives typically associated with upward mobility do not detail the various ethical costs the striver has endured, thus skewing the path for those who expect to follow without core personal, familial, and communal sacrifices (Morton, 2019).

Such framing has a clear relevance to what the research tells us regarding the various commitments post-traditional students navigate in and out of college. Morton (2019) notes, "In order to seek a better life for themselves, strivers must often enter different communities - those in which opportunities for advancement are available" (p. 7). While students included in this study attended one community college, educational aspirations related to transfer may necessitate a change of location from where they call home. In addition, some may make trade-offs in order to attend a college with above average transfer rates. Learning about students who travel outside of their spatial contexts to navigate opportunities within Los Angeles County, a large metropolitan area with seemingly endless opportunities, will help us disentangle the complex

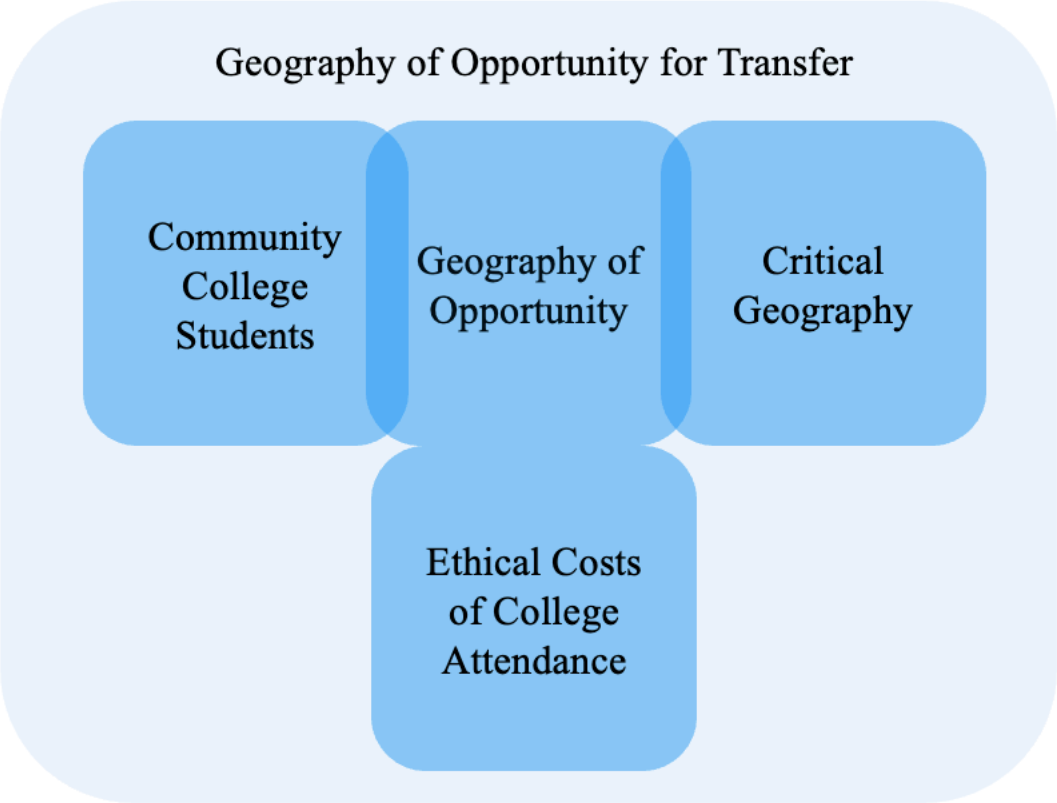
ways that geography of college opportunity manifests for students in their pursuit of transfer to a four-year institution.

Summary

The literature shows an interesting area for research exploration at the intersection between geography of college opportunity and community college student persistence to transfer.

Figure 2

Areas of Study Related to this Research



Furthermore, this study draws from frameworks regarding critical geographic college access and the ethical costs of college attendance to ground the research study. The following chapter will

outline the methods used to conduct the study which draws from various bodies of literature to put forth a unique contribution (see Figure 2).

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

Given the extant literature reviewed in the previous chapter, there is a clear need for research which explores the connection between the geography of college opportunity and transfer success for students attending community college. This study spatially contextualizes transfer trajectories for a cohort of students attending a community college in Southern California. The embedded single-case study is driven by research questions exploring the geography of college opportunity of community college students in relation to 3-year transfer success. By pairing local context with institutional student-level data, we can learn how students from different spatial contexts attend and progress through community college and identify points for intervention to support transfer success. This chapter includes the rationale for undertaking a case study and the resulting research design, including the sources of data and the key variables under consideration. In addition, I detail the approach to data analysis and outline additional considerations such as validity and limitations of the study.

Methodological Approach

Case Study

This geography of college opportunity study requires a method which rigorously accounts for the context surrounding the transfer trajectories of community college students. The research question above is best answered with the case study method in part due to the need to bring in data from multiple sources and explore the experiences of a cohort in depth in relation to their surrounding contexts. The process of exploring what I refer to henceforth as the geography of opportunity for transfer among community college students is best examined within spatial contexts, thus aligning with a single-embedded case study design.

In social science research, the case study is defined as a "research method generally used to investigate a contemporary phenomenon in depth and in its real-world context" (Yin 2018, p. 286). While Yin (2018) acknowledges that overlapping options exist when selecting the appropriate research method for a given question, he outlines three conditions under which undertaking case study research is particularly advantageous: a) the research question attempts to explain a phenomenon by asking a "how" or "why" question, b) the phenomenon of interest is contemporary (not best served by a historical study), and c) the researcher does not control the events (as they would in an experiment). This study meets all three criteria and therefore the case study method is not only applicable–as several approaches could be–it is especially suitable.

According to Yin (2018), this mode of inquiry has a few main types. Researchers may choose to pursue a single or multiple case study and a holistic or embedded design. Single case studies are appropriate when a study examines a case which is critical, extreme, common, longitudinal, or revelatory (Yin, 2018). As detailed below, in order to research the role of the geography of opportunity for transfer, I selected an institution with a relatively high transfer rate, potentially attracting students from throughout the surrounding region. The cohort in this study may therefore be viewed as an extreme case among community college students, which is fitting for a single-case study design. The study is further structured into an embedded design in order to examine the specific subunits of interest of transfer rates and spatial contexts in additional depth without losing focus on the larger task of exploring the phenomenon within its context (Yin, 2018).

Furthermore, while some researchers focus on using qualitative research with the case study method (Yazan, 2015), Yin maintains that case studies can be mixed methods, qualitative, or quantitative in nature (2018). This study utilizes quantitative data on students, institutions, and

spatial contexts. While case studies can be used to investigate quantitative data, this mode of inquiry is employed differently than typical quantitative studies. Given that single-case studies consist of a sole data point for the purposes of analysis, the number of variables in this particular mode of inquiry will exceed the number of cases (Yin, 2018). This means that many of the usual quantitative data analyses should not be run in this mode of inquiry due to limited variation in the unit(s) of analysis (Yin, 2018). The approach to analysis is further detailed later in this chapter but it is worth noting at this stage that analytic generalizations (as opposed to statistical inferences to a larger population) are expected to arise from this case study research (Yin, 2018). As Yin (2018) points out, one feature of case study research is that it draws on various sources to triangulate findings within a particular context. Detailed contextual variables can provide insight not otherwise available with other methods. With careful adherence to the guidelines and principles of quality case study research, a thorough and rigorous research study can provide insight into the geography of opportunity for community college transfer.

Research Design

An embedded single-case study research design is utilized to explore the phenomenon of interest (geography of opportunity for transfer) within a particular context (Los Angeles County). This study explores 3-year transfer success for a cohort of students who first enrolled at Sunshine Community College (or SCC, a pseudonym) in Fall 2013. In this section, I outline the research questions, the criteria for a successful study, and define the case.

This study considers the following research questions:

1. What is the geography of college opportunity that surrounds students who transfer within 3 years?
2. Is there a relationship between geography of college opportunity and 3-year transfer?

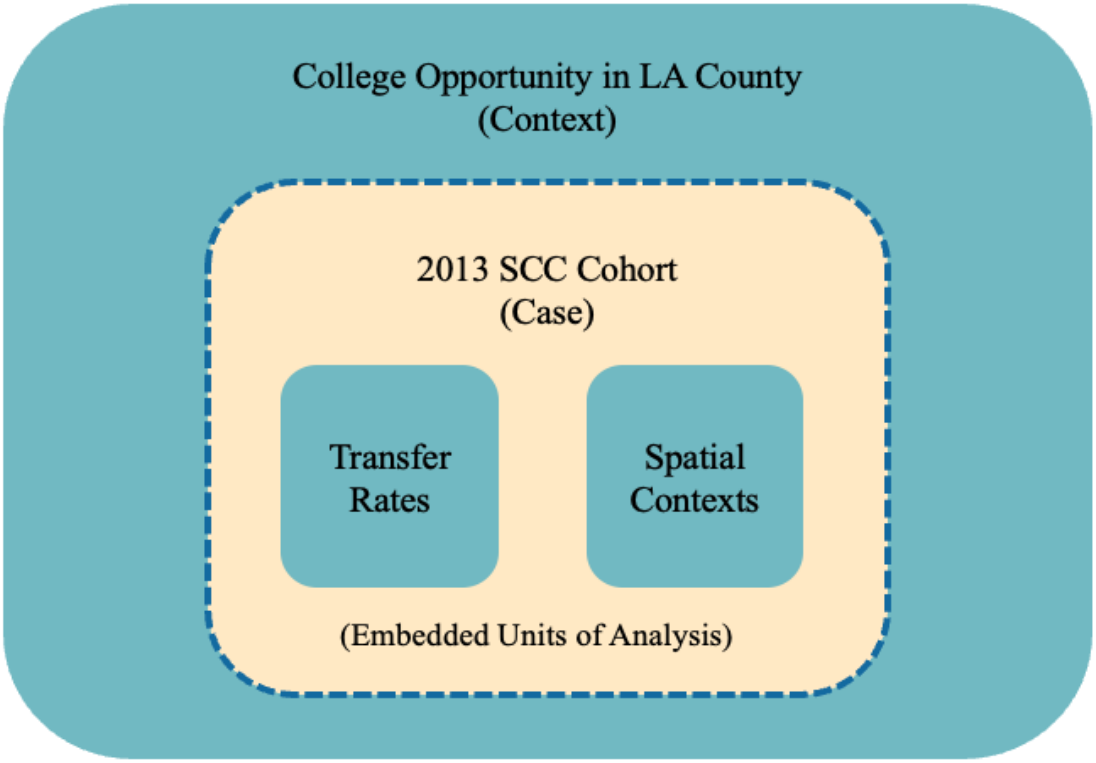
a. To what extent does 3-year transfer success vary by local access to higher education?
b. To what extent does 3-year transfer success vary by closeness to Sunshine Community College (SCC)?

Exploring the questions above will help inform how 3-year transfer success from a community college with an above average transfer rate can shed light on the concept of geography of college opportunity.

As exploratory research, this case study does not include explicit propositions. However, as Yin (2018) recommends, I instead include here the purpose of the exploratory study and criteria for success. The purpose of the study is to explore the transfer trajectories of community college students in relation to their geographies of college opportunity. As detailed below, in order to explore this, I selected a community college that attracts students from beyond the immediate vicinity to more clearly show the role of geography of opportunity for transfer. In addition, focusing on whether students achieved transfer within three years will illuminate whether and how students from different contexts experience transfer within a specific span of time. This research will be successful if we can a) operationalize student-specific geographies of college opportunity throughout Los Angeles County, b) understand which geographies of opportunity are associated with 3-year transfer success and c) develop informed areas for future research informed by this exploratory endeavor. The nature of this approach will not result in a causal explanation or a deterministic attribution of spatial opportunity in relation to transfer success. On the contrary, this approach is meant to inform our understanding of the geography of college opportunity and identify potential assets as well as areas to focus resources for students associated with particular areas.

Figure 3

Embedded Single-Case Study Design



Defining the case, as well as the surrounding boundaries, is an important component of case study design in part due to feasibility – we can successfully research rigorously in depth within certain bounds (Yin, 2018). The phenomenon of interest in this study is geography of opportunity for transfer. The case or "unit of analysis" in this study is a cohort of community college students. As with any case study, it is important to define certain boundaries in order for the researcher to stay focused on the particular case while in the midst of navigating data from multiple sources and often several variables (Yin, 2018).

In order to bound the case, a few key criteria were considered. First, the study was limited to a cohort of students attending one community college in Los Angeles County. Given

the topic of study, it was important to choose an institution with students attending from different geographic contexts. An institution with a relatively high transfer rate was chosen in part for this reason (see the more detailed description of site selection below). In addition, an entering cohort of students was selected to enact a temporal bounding of the case. This study centered on students who were noted to be degree-seeking in order to focus on those with an interest in degree completion and/or transfer, as opposed to taking a course or two. The case was further bounded by Los Angeles County even though some students were from the Greater Los Angeles Area (i.e., Orange County). However, since spatial context is so important to this study, it was important to bound the selection of students to those who reside in L.A. County to focus this study further on the geography of opportunity for transfer in Los Angeles. The surrounding context for this cohort of students is LA County and for each student we are interested in the 5-mile radius from their home.

Site Selection

Due to the density of community colleges in the region, Los Angeles was a clear area of consideration early on. An initial review showed that Los Angeles County has over 20 community colleges, many of which are affiliated with the Los Angeles Community College District. The boundary lines of Los Angeles city proper were, however, inappropriate bounds for this study as "LA" community colleges are scattered throughout surrounding cities (e.g., West Los Angeles College in Culver City and Los Angeles Harbor College in Wilmington). LA County includes the City of Los Angeles as well as the many cities and unincorporated towns which make up the fabric of what is commonly referred to as "LA". Therefore, we use the terms

"Los Angeles", "Los Angeles County", and "LA area" interchangeably here to refer to the general area of interest included within LA County boundary lines.

In order to examine the geography of opportunity for transfer, this study focuses on a cohort of students attending a specific institution. The site of this study is Sunshine Community College (SCC), a pseudonym for an institution in the Los Angeles area. SCC is of particular interest because, according to the institution's website, it has high levels of transfer when compared with other community colleges across the state. The institution ranks highly by various measures including transfer to University of California and California State University campuses and on various equity metrics, attracting students from across the Greater Los Angeles Area and enrolling over 30,000 students a year. Over half of the students who enroll in the range of associate degree, certificate, and non-credit offerings at SCC attend part-time and/or receive some kind of tuition support. While not all SCC students seek to transfer to a bachelor's granting institution, many do seek to transfer and do so successfully within several years as evidenced by the institution's track record. SCC is consistently above average for overall six-year transfer in the state and within the microregion of Los Angeles / Orange County (Launchboard May 2023). Furthermore, the institution ranked in the top 5 for overall six-year transfer in LA County in the years leading up to and including the 2013 entering cohort (CCC Data Mart). Given the interest in exploring the geography of opportunity of community college students in Los Angeles, SCC is a particularly interesting case because students may go out of their way to attend a community college with a reputation for transfer success and therefore attend from a range of spatial contexts.

Data Collection

As mentioned earlier in this chapter, there was a need to explore many sources and variables in order to explore the geography of opportunity for transfer. I also took care to include in the initial analysis some variables associated with Dache's (2018) taxonomy of college deserts and oases in an effort to shed light on the ways the concepts of spatial mismatch and power geometry show up in the geography of opportunity for transfer. The data for this study was therefore collected from a range of sources. This section outlines data obtained for the cohort and surrounding spatial context.

Student Cohort

This case study focuses on the 2013 entering cohort of Sunshine Community College. The deidentified student-level data came from the institution and included variables regarding transfer and completion outcomes, demographics (e.g., age, race, gender), and whether students received need-based aid. Scrambled geocoded student addresses were utilized to connect student location to surrounding context variables. Nearly 7,000 students entered SCC in the 2013-14 fall term. As detailed further in the descriptive analysis of Chapter 4, the dataset under analysis consists of 2,907 students in order to focus on first-time, degree-seeking students, with precise location data available, enrolled in at least 12 units during their time at SCC, were at least 18 years of age, unduplicated in the dataset, and who were also located within the spatial context of LA County. I reviewed the term the student first started at SCC, whether they intended to complete a degree, and part-time or full-time status. Regarding transfer success, variables detailing the units attempted, award earned, transfer, and outcome within three years were most helpful. Over three-quarters of students received need-based aid and over half of the students in this cohort identify as Hispanic or Latina/o/x (see Table 1 for additional cohort demographics).

Spatial Context

Publicly available data informs our understanding of college opportunity within the region of interest. The U.S. Census American Community Survey (ACS) 2013 5-year estimates provide census tract level demographics such as population, median household income, and educational attainment. The National Center for Education Statistics Integrated Postsecondary Education Data System (IPEDS) provides 2013 data regarding the accessibility of higher education institutions to provide insight into educational opportunity in the area. IPEDS data included admissions rates, affordability, geographic location, and transfer acceptance for institutions within LA County. This data was not limited to community colleges or by sector (i.e., non-profit/for-profit, public/private), as it was important to gain an overall understanding of the college opportunity that existed within the region at the time of this study. In addition, the California Community College Data Mart system provided more detailed information on transfer rates within the statewide system. Distance to SCC, the closest community college in the area, the outcome rates at the closest community college were calculated in ArcGIS to inform our sense of college opportunity in a given area (Chapter 4 provides additional detail on each variable and how they were calculated). Shapefiles were obtained through the U.S. Census TIGER/Line Shapefiles website for 2013 and from the LA County Enterprise GIS Data Hub.

Data Analysis

Critical Spatial Inductive Approach

As a first step in analyzing the research, I explored the data. Some visuals such as hot spots shedding light on examples of spatial mismatch and power geometry and other related

tables were helpful in this regard, as detailed further in the findings section. Next, I decided that it was most appropriate to use an inductive general research strategy (Yin, 2018) given the embedded design and the quantitative nature of the case study. Throughout the process, I considered rival explanations to the patterns that emerged and incorporated variables to consider those when possible (Yin, 2018).

Defining Boundaries

In order to explore the geography of opportunity for transfer, there was a need to identify and assign students to local geographic areas within LA County. Borders were imported into ArcGIS software in the form of shapefiles which are defined as a "vector data storage format for storing the location, shape, and attributes of geographic features" (Law & Collins, 2015, pp. 775). I reviewed publicly available shapefiles at the national, state, county, and local levels and chose to utilize the polygon boundaries of the United States, California, and Los Angeles County in foundational base maps. The Los Angeles County shapefile was particularly helpful in the early stages of this research during a spatial join which provided the basis for selecting students who were located within the county.

As previously mentioned, American Community Survey spatial context data was available at the census tract level. Census tracts consist of approximately 4,000 residents and are designed to "provide a stable set of geographic units for the presentation of statistical data" (U.S. Census Bureau, 2023). While this more granular ACS data was of interest, it required spatial aggregation in order to analyze it at a more meaningful level for the purposes of this study. A spatial join in ArcGIS would overlay census tracts with other larger boundaries such as neighborhoods and regions. The best publicly available neighborhood-like boundaries without

publishing restrictions for LA County at the time of this study came from LA County GIS. However, neighborhoods did not capture the geographies of interest for this study upon further analysis as they restricted the area of interest too far and so I ultimately decided to create 5-mile buffers around each student to represent their spatial contexts. The website housed open data on Countywide Statistical Areas (CSAs) for cities and neighborhoods as well as Workforce Regions. Together, these shapefiles delineate effective, though admittedly imperfect, boundaries for the purpose of analyzing the local educational contexts and opportunities of SCC students.

Geospatial Mapping

Following the collection of student-level, institutional, and ACS data, I explored the datasets in R open-source software by running descriptives and verifying the quality and condition of the data. In order to prepare the datasets for spatial analysis, I cleaned and merged them to create files with one row per student in alignment with principles of data science (Wickham & Grolemund, 2017). The mutate and summarise functions in R facilitated data manipulation as I created new variables of interest via disaggregation and recoding. The transfer data required calculation from a variable on the date students began attending a four-year institution through data SCC received from the National Student Clearinghouse.

Descriptive analysis was particularly appropriate due to the goal of exploring and describing the geography of college opportunity in Los Angeles. Correlation tables were used to review relationships between variables of interest. I also used ArcGIS software by Esri to map the geography of college opportunity and calculate hot spots as appropriate. Following the initial findings, it seemed appropriate to create an index for college opportunity to more succinctly and visually convey the resources in each context based on the literature and relevant variables

available. Confidentiality was key in reporting the findings of the study and special measures were taken given the visual representations of the results. Geocoded address data was scrambled to ensure the individual student addresses were not identifiable.

Additional Considerations

Positionality

During my doctoral studies, I have engaged in research regarding community college access and equity. My understanding of community college student experiences is informed not only by academic articles but by interviewing community college students, teaching transfer students, and assisting in a course on the sociology of community colleges.

In addition, my family, friends, and I benefitted from the coursework and community programming available at our local community college. Though I attended a four-year university directly following high school, I attended the local college when I needed to retake pre-calculus in high school and to complete a general education requirement while home from UC Santa Cruz over the summer. It was where I was introduced to what would later become a passion for statistics, and it gave me the foundation I needed to begin tutoring my peers in statistical methods and engaging in research as an undergraduate.

Over the years, I came to realize what a profound impact an open-access public college can have on a community and how fortunate I was to have access to a local institution of higher education. I often reflect on the opportunities I was fortunate to have growing up in an area with a local community college as well as a California State University 30 minutes away and a University of California 45 minutes away. Going away to college was challenging but it did not fully entail saying goodbye to the community I was linked with as I attended a UC close to

home, visited as often as possible, and lived at home during academic breaks. I know that there are many opportunities that were afforded to others by growing up just north in Silicon Valley, for example, that I did not benefit from but there are also many opportunities that I did enjoy in comparison to the "educational deserts" described by Hillman (2016).

However, I am also aware of the shortcomings that many experience in relation to the community college system. Between anecdotal stories from peers who attended and took many years to transfer to a bachelor's granting institution, if at all, and my research background, it is clear that the institutions do not always meet their potential as open access points leading to cost-effective degrees via transfer. Structural issues from challenges obtaining financial aid (Campbell et al., 2015) to accessing quality academic counseling (Tovar, 2015) can inhibit students from reaching their academic goals. That being said, I maintain faith in the potential of such institutions, given the good work they currently engage in for and with the local community with the resources available to them, and given the huge potential of the diverse students who gravitate to them year after year.

Validity and Reliability

Construct validity involves ensuring concepts are examined using appropriate measures (Yin, 2018). I operationalize the terms geography of college opportunity and transfer earlier in this chapter as a first step to establishing construct validity. Variable selection and the measures for geography of opportunity for transfer were informed by the literature. In alignment with case study methodology, this research draws from various sources to triangulate the measurement of the concept of geography of opportunity for transfer (Yin, 2018). For instance, 3-year transfer rates were calculated within the institutional dataset and cross-referenced with CCC Data Mart

which hosts publicly available data on all California community colleges along with the literature on 3-year transfer rates at community colleges in general. External validity, or the generalizability of the findings, is addressed in the research design as I seek to use the findings to inform the concept of geography of opportunity and make analytic generalizations, as opposed to a statistical generalization applying to larger student population (Yin, 2018). In addition, I detail the procedures and methods of the study to ensure reliability, or that if another researcher tried to replicate the same study, they would obtain the same results (Yin, 2018).

Limitations

Even the most well-designed studies have their limitations. In the case of this research, I encountered a few key limitations detailed here. First, while I had access to student-level data that could be calculated into a binary transfer within three years variable, I was unable to gage initial individual interest in transfer with the institutional data available. Ideally, research on a cohort's 3-year transfer rate would be able to account for students who entered the institution with a desire to transfer. In the absence of data on transfer interest, I cross-referenced the student-level information with the data available through the CCC Data Mart. This repository includes institutional transfer rates calculated uses six years of data in alignment with Riley Bahr et al. (2005) to determine a "behavioral intent to transfer" among the cohort (CCC Data Mart). In addition, I focused my analysis on those who successfully transferred from SCC within three years. This is also aligned with a more asset-based approach as I avoid a tendency to attribute non-transfer as a personal deficit of students who may have, for example, encountered structural barriers to transfer or changed their educational goals since indicating an initial interest in transfer.

Furthermore, I would have liked to incorporate the analysis of 3-year transfer for students from multiple SCC cohorts. Additional cohorts could lend richer insight into our understanding of 3-year transfer in relation to geography of college opportunity as certain patterns could become more salient with the added dimension of multiple cohorts over time. However, I decided to focus on the 2013 SCC cohort for a few reasons. As mentioned above, the CCC Data Mart transfer rate was critical in the triangulation of the data. It was important to choose a cohort with six years of data available in order to have access to these calculations. In addition, this cohort was particularly intriguing in part because of the potential to explore transfer rates up to six years in future research without the intersection of the COVID-19 pandemic data which would likely skew the overall findings. This particular study is so reliant on the home distance from SCC that future findings building on this research would be disrupted by an era of remote and hybrid learning.

Finally, the sole use of home address geolocation data to pinpoint where students are "from" is a limitation of the study. Some students did not have a home address on file leading them to be excluded from the analysis. The starting point of current home addresses is also not terribly nuanced and would ideally be triangulated with multiple sources of data for a better understanding of the student's starting point in relation to the location of SCC. Future research may find high school addresses and even a survey asking where students usually commute from (in case it is a nearby job, for example) to add an additional and helpful dimension to research on the geography of opportunity for transfer. In the absence of more detailed data such as this, home addresses are a sufficient proxy for starting point and are the most replicable for future studies.

Chapter 4 outlines the findings of the study outlined above and Chapter 5 considers how examining spatial contexts in relation to transfer helps advance our understanding of the concept of geography of college opportunity.

CHAPTER 4: FINDINGS

This study sought to explore the spatial contexts of students from the 2013 entering cohort of Sunshine Community College (SCC) in relation to their transfer outcomes. We focused specifically on whether students transferred within three years in order to account for those who transfer within 150% of "normal" completion time of what is often referred to as a "2-year" degree. The following chapter outlines the results of the study. First, descriptive statistics inform a more detailed and foundational understanding of the 2013 entering cohort. Next, we describe the geography of college opportunity that surrounds students who transfer within three years. Finally, this chapter concludes with findings from the exploration of a potential relationship between indicators of geography of college opportunity and 3-year transfer. In the discussion and conclusion chapter that follows, we explore the implications of these findings as we seek to expand our understanding of the concept of geography of opportunity in relation to community college transfer.

Descriptive Statistics

This section provides a demographic and academic overview of the SCC students included in the analysis, disaggregated by 3-year transfer status. In addition, we begin to explore the spatial contexts from which students attend SCC.

Student Demographic Characteristics

This research focuses on the spatial contexts and transfer outcomes of 2,907 students who entered SCC in Fall 2013. Given the interest in transfer outcomes along with other considerations outlined in the previous chapter, the initial dataset of over 6,000 students was

cleaned and filtered to focus on first-time, degree-seeking students, with location data available, who resided within LA County, enrolled in at least 12 units, were at least 18 years of age, and were unduplicated in the dataset. The resulting cohort of interest - henceforth referred to as the "cohort" - consists of 2,907 community college students who were potentially interested in transfer and for whom spatial contexts can be explored. As shown in Table 1, the cohort is comprised of a similar proportion of male and female students. The majority of students in the entering cohort (64.7%) are 18 years of age and most (75.7%) received need-based financial aid. A few racial/ethnic groups make up the majority of students in the cohort with three out of four students listed as either Latina/o/x (53.6%) or Asian (22.5%).

In order to answer the research questions, the 2,907 students were split into two subgroups: Transferred within 3yrs and Did Not Transfer within 3yrs. Those who transferred within three years may have transferred to a four-year institution within 1, 2, or 3 years of beginning their studies at SCC in Fall 2013. Those who did not transfer within three years may have transferred within 4-6 years or may not have transferred at all. While we do not have a specific variable which indicates transfer interest, both subgroups of students were first-time, degree-seeking, and completed at least 12 units as aligned with other metrics of determining a cohort of students potentially interested in transfer (see Chapter 3). As Table 1 shows the majority of those who transferred within three years were female (51.2%) while the majority of those who did not transfer were male (51.9%). Of the students who transferred, 65.0% received need-based financial aid, whereas 77.4% of students who did not transfer received need-based financial aid. Those who transferred within three years were overwhelmingly 18 years of age (79.1%) when they started at SCC. They were also slightly younger on average (mean = 18.8)

compared to those who did not transfer within three years (mean = 19.8), though both subgroups tended to be young (see Appendix A).

Table 1

Demographic Characteristics of SCC 2013 First-Time Cohort by Transfer Outcome

	Overall (n = 2,907)		Transferred within 3yrs (n = 412)		Did Not Transfer within 3yrs (n = 2,495)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Gender						
Female	1,410	48.5%	211	51.2%	1,199	48.1%
Male	1,497	51.5%	201	48.8%	1,296	51.9%
Age						
18	1,880	64.7%	326	79.1%	1,554	62.3%
19-23	788	27.1%	69	16.7%	719	28.8%
24+	239	8.2%	17	4.1%	222	8.9%
Need-Based Aid Received						
Yes	2,200	75.7%	268	65.0%	1,932	77.4%
No	707	24.3%	144	35.0%	563	22.6%
Race/Ethnicity						
Asian	654	22.5%	187	45.4%	467	18.7%
Black or African American	95	3.3%	7	1.7%	88	3.5%
Hispanic/Latino	1,558	53.6%	108	26.2%	1,450	58.1%
American Indian or Alaska Native	2	0.1%	0	0.0%	2	0.1%
Native Hawaiian or Other Pacific Islander	6	0.2%	0	0.0%	6	0.2%
Two or More Races	79	2.7%	16	3.9%	63	2.5%
White, Non-Hispanic	370	12.7%	93	22.6%	277	11.1%
Unknown	143	4.9%	1	0.2%	142	5.7%

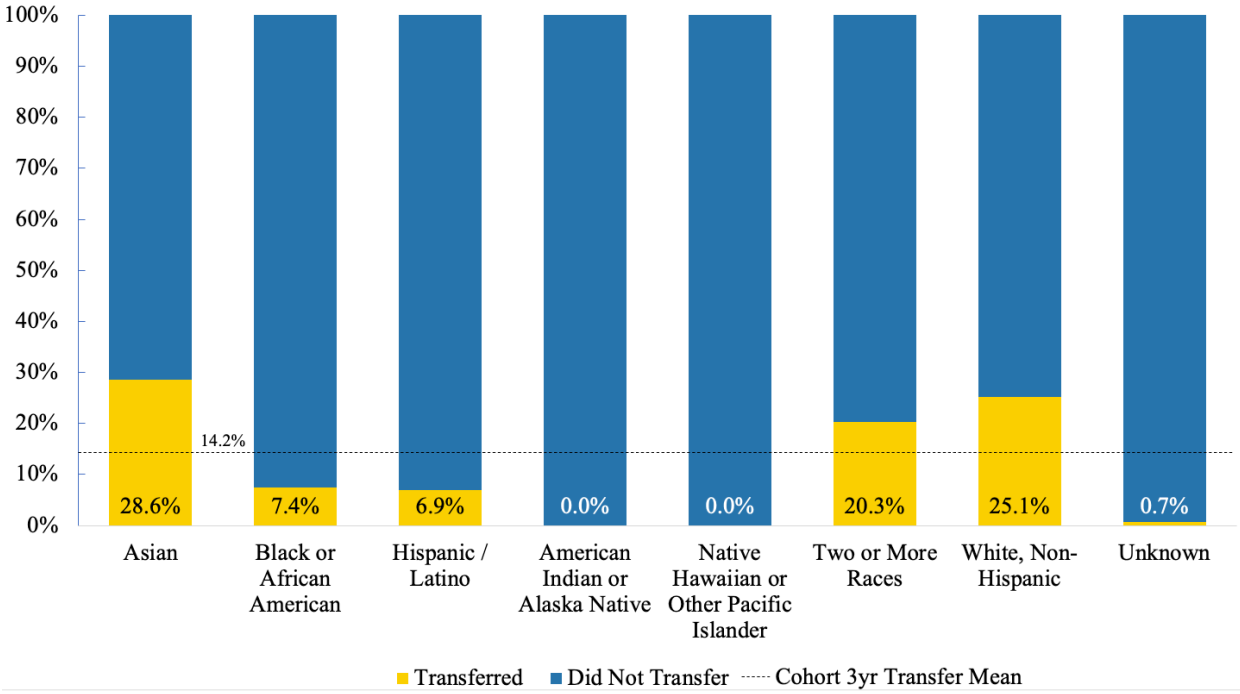
In terms of racial/ethnic representation among the subgroups, Table 1 above shows that while among the cohort 53.6% of students are from a Latina/o/x background, they represent

26.2% of all who transferred within three years. Similarly, Black/African American students comprise 3.3% of the overall cohort but 1.7% of those who transfer within three years. In contrast, Asian students account for 22.5% of the overall cohort and 45.4% of those who transfer. Similarly, White, non-Hispanic students comprise 12.7% of the cohort and 22.6% of those who transfer in three years.

In order to understand this disparity further, Figure 4 shows the proportion of students from each racial/ethnic background who transferred within three years. Students from Asian (26.8%), White, non-Hispanic (25.1%), and Two or More Races (20.3%) backgrounds have higher than average transfer rates when compared with the overall cohort of interest (14.2%). In contrast, students from Black/African American (7.4%), Latina/o/x (6.9%), Unknown (0.7%), American Indian/Alaska Native (0.0%), and Native Hawaiian/Pacific Islander (0.0%) backgrounds have lower than average transfer rates when compared to the overall cohort (14.2%). The percentages affiliated with American Indian/Alaska Native and Native Hawaiian/Pacific Islander students should be interpreted within the context of their low representation in the cohort of interest (n = 2 and n = 6, respectively). Nevertheless, it is worth noting that none of the students from these backgrounds were supported to an outcome of transfer within 3 years' time.

Figure 4

Three-Year Transfer Status by Race/Ethnicity (n = 2,907)



In anticipation of the shift later in this chapter to focus on the geography of college opportunity surrounding the subgroup of those who transferred within three years, it is worth noting that the 412 students will diverge demographically from the overall cohort of 2,907. However, this is not a concern given that the aim of this research is not to generalize from a sample to an overall population. On the contrary, as will later be discussed in the final chapter in more depth, distinctions between subgroups point to potential areas of growth and opportunities for the institution to support students of various backgrounds to efficient pathways of transfer within three years' time.

Student Academics and Outcomes

Next, we explore the academic characteristics and outcomes for the 2013 cohort. As outlined in Table 2, the majority of students in the overall cohort of interest (57.0%) attended SCC full-time. When we examine the proportion of full-time to part-time students broken down by subgroup, we see that a comparatively higher segment of the students who successfully transferred within three years attended full-time (77.9% vs. 53.6%). In terms of GPA, the overall cohort shows 18.5% of students with a GPA of 3.0. However, when examined by subgroup we see that those who transferred had GPAs above 3.0 (55.8%) at a higher rate compared with those who did not transfer (12.3%). In fact, an inverse pattern appears to occur when we compare those who did not transfer with GPAs below 2.0 (56.4%) compared to those with GPAs below 2.0 who transferred within three years (8.7%).

The cohort overall had a broad range of units attempted. The subgroups show that those who transfer have a higher rate of attempting 60 or more units (81.1%) when compared with their counterparts who did not transfer within three years (46.9%). Interestingly, 18.9% of the first-time students who successfully transferred within three years attempted less than 60 units. While junior-level transfer to the University of California system requires 60 semester units[3], students may transfer as lower-division students to the UC under special circumstances or to other four-year institutions including private institutions and out-of-state universities which may have different transfer admission requirements. In addition, Table 2 shows the breakdown of those who passed gateway English and Math classes within the first year. Students who transferred within three years passed both English and Math gateway courses in their first year at

[3] https://admission.universityofcalifornia.edu/counselors/preparing-transfer-students/transfer-requirements.html

higher rates (65.5% and 64.8%, respectively) compared to their peers who did not transfer within three years (28.4% and 22.6%, respectively). Such a discrepancy begins to shed light not only on yet another indicator of how the subgroups differ in terms of their academic progress but also the importance of the forthcoming legislation at the time to reimagine remediation within the California Community College system in an attempt to address structural inequities.

Table 2

Academic Characteristics of SCC 2013 First-Time Cohort by Transfer Outcome

	Overall (n = 2,907)		Transferred within 3yrs (n = 412)		Did Not Transfer within 3yrs (n = 2,495)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time Status						
Full-Time	1,658	57.0%	321	77.9%	1,337	53.6%
Part-Time	1,249	43.0%	91	22.1%	1,158	46.4%
GPA						
> 3.0	537	18.5%	230	55.8%	307	12.3%
2.0 to 3.0	927	31.9%	146	35.4%	781	31.3%
< 2.0	1,443	49.6%	36	8.7%	1,407	56.4%
Units Attempted						
< 30	690	23.7%	45	10.9%	645	25.9%
30 to 59	711	24.5%	33	8.0%	678	27.2%
60 to 90	679	23.4%	199	48.3%	480	19.2%
> 90	827	28.4%	135	32.8%	692	27.7%
Passed Gateway English in Year 1	979	33.7%	270	65.5%	709	28.4%
Passed Gateway Math in Year 1	831	28.6%	267	64.8%	564	22.6%

Next, we explore the 3-year outcomes of the 2013 SCC cohort. As shown in Table 3, the vast majority of the cohort (76.6%) did not transfer or earn an award (degree or certificate) within three years. For the purposes of this study, we are particularly interested in the 14.2% of students in the cohort who transferred within three years. A more detailed breakdown shows that 8.4% of the cohort transferred and 5.7% of the cohort transferred and earned an award within three years. Furthermore, it is helpful to note for the larger context of this study that an additional 9.2% of students in the cohort did not transfer within three years but did earn an award. This serves to rightly complicate our ideas of the subgroup who did not transfer. That is to say, this cohort of students who were all potentially interested in transfer may have ultimately achieved their desired outcome of earning an award and are not represented as such in the subgroup divisions of transfer/non-transfer.

Table 3

3-Year Outcomes of SCC 2013 Cohort (n = 2,907)

	Freq.	Percent
Award within 3 Years	435	15.0%
Award Only	268	9.2%
Award and Transfer	167	5.7%
Transfer within 3 Years	412	14.2%
Transfer Only	245	8.4%
Transfer and Award	167	5.7%
Outcome within 3 Years		
Award and/or Transfer	680	23.4%
No Award and/or Transfer	2,227	76.6%

Spatial Characteristics of Cohort

Table 4 outlines the distance from a student's home address to SCC and to the closest community college in miles. On average, students traveled approximately 7 miles to attend Sunshine Community College but their closest community college was on average closer at 3 miles away. SCC was the closest community college for only one-third (34.6%) of the cohort. Students who transferred within three years lived in proximity to SCC - as opposed to other community colleges - at higher rates (41.5%) compared to their counterparts who did not transfer within three years (33.5%).

Table 4

Proximity Characteristics of SCC 2013 First-Time Cohort (n = 2,907)

	Median	Mean	SD	Min	Max
Distance to Sunshine Community College					
Cohort	6.1	7.2	4.9	0.1	37.6
Transferred within 3 Years	5.3	6.8	5.0	0.2	33.4
Did Not Transfer within 3 Years	6.3	7.3	4.9	0.1	37.6
Distance to Closest Community College					
Cohort	3.3	3.3	1.5	0.1	15.7
Transferred within 3 Years	3.5	3.5	1.6	0.2	15.7
Did Not Transfer within 3 Years	3.2	3.3	1.4	0.1	12.2

	n	Freq.	Percent
SCC is the Closest Community College			

Cohort	2,907	1,006	34.6%
Transferred within 3 Years	412	171	41.5%
Did Not Transfer within 3 Years	2,495	835	33.5%

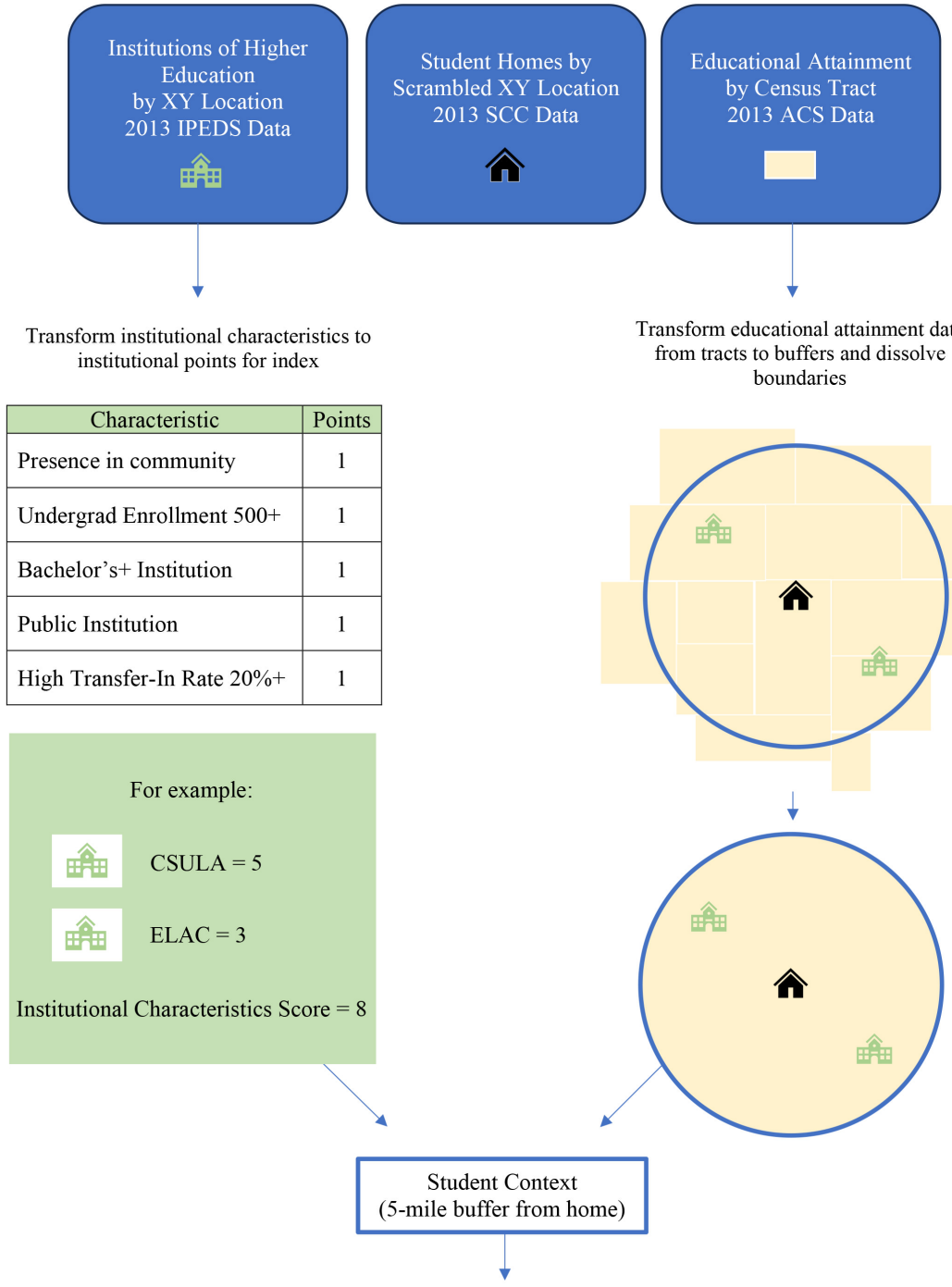
Now that we have examined the cohort in depth with descriptive statistics, we turn to the findings for each research question.

Research Question 1: What is the geography of college opportunity that surrounds students who transfer within 3 years?

In order to answer the first research question, I created an index for college opportunity which was assigned to each student based on the postsecondary opportunities that surrounded them. The index for geography of college opportunity for the purposes of this study was comprised of the higher education institutions and the educational attainment within the 5-mile radius that surrounded student home addresses. In order to calculate this, a 5-mile buffer was generated around each student's address in ArcGIS in order to create the polygon of interest. Then, these polygons were overlayed with a) point data on institutions of higher education from IPEDS and b) polygons based on census tracts populated with educational attainment data from the 2013 5-year estimates of the U.S. Census American Community Survey (see Figure 5).

Figure 5

Calculation of GCO Index Scores



Characteristic	Points
Presence in community	1
Undergrad Enrollment 500+	1
Bachelor's+ Institution	1
Public Institution	1
High Transfer-In Rate 20%+	1

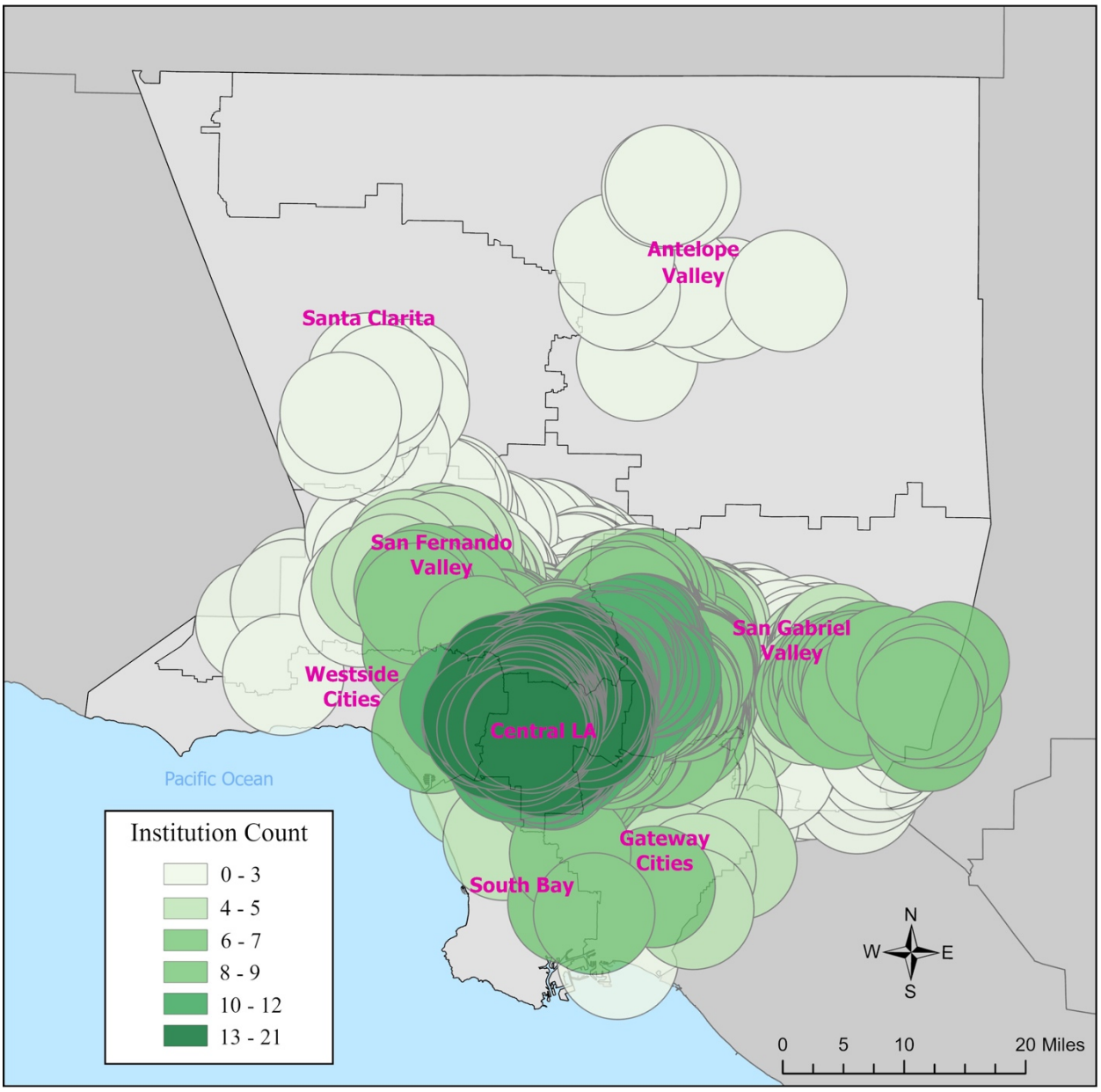
The Geography of College Opportunity (GCO) Index Score was then calculated for each student as follows:

$$\frac{\left[\frac{Student\ Context\ Institutional\ Characteristics\ Score}{Cohort\ Max\ Institutional\ Characteristics\ Score} + \frac{Student\ Context\ Population\ with\ Bachelor's\ Degree}{Cohort\ Max\ Population\ with\ Bachelor's\ Degree}\right]}{2}$$

I conducted a one-to-many spatial join to connect the institution points to buffers representing students' surrounding contexts (see Figure 6). In order to populate each 5-mile buffer with the educational attainment estimates, I first conducted a pairwise intersect in ArcGIS that overlayed the census tracts and the buffers to match areas of overlap. I then calculated the area of the buffers in square miles, the area of each census tract, and the proportion of each census tract included within each buffer. With this information I was ultimately able to estimate the number of people living within each 5-mile buffer with an educational attainment of bachelor's degree or higher after running the dissolve geoprocessing analysis to compile the portions of each census tract that fell within each 5-mile buffer along with the associated educational attainment data (see Figure 7).

Figure 6

Institutional Density within Student Contexts

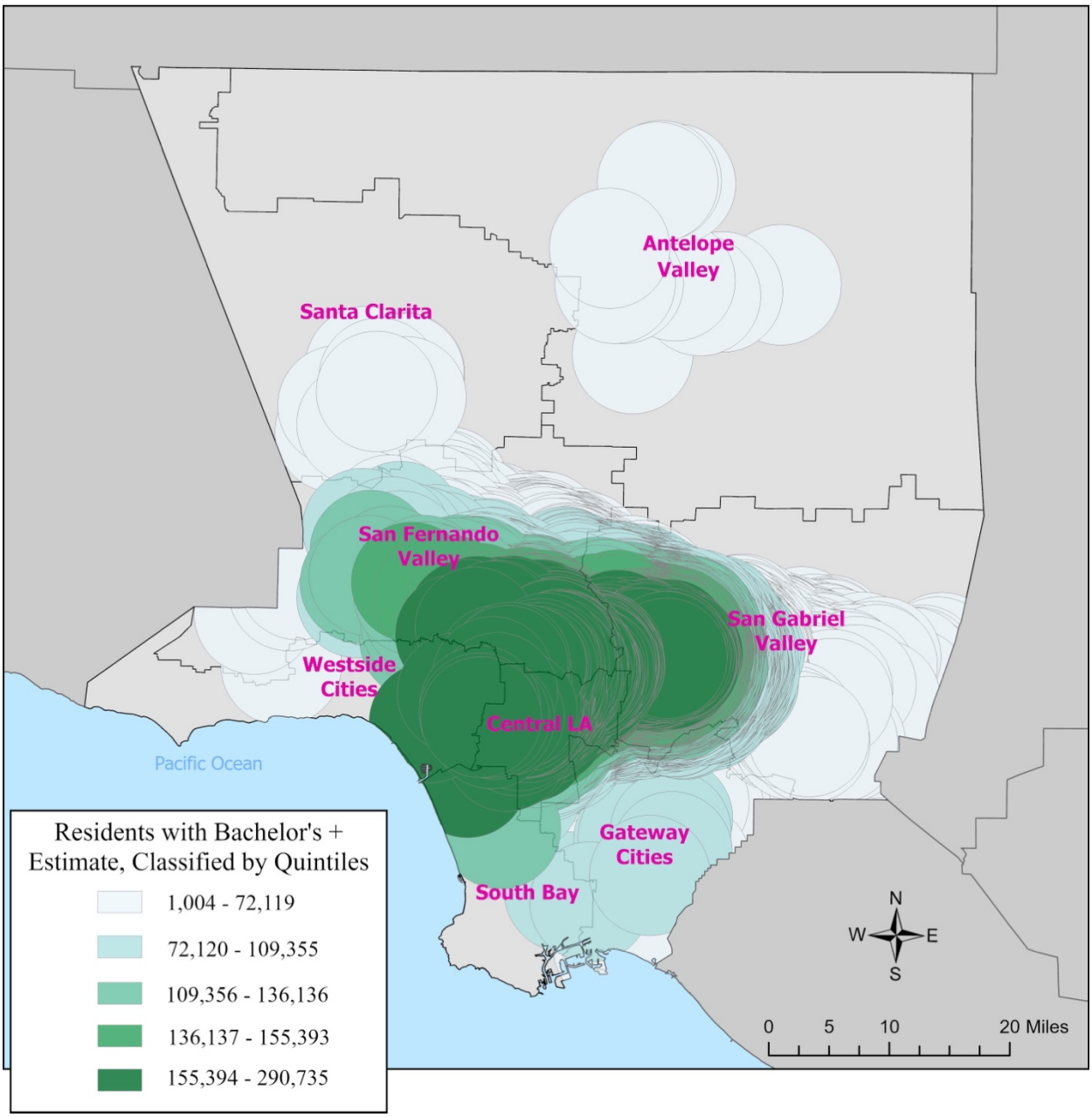


Data Sources: SCC Institutional Data – 2013 Cohort; IPEDS 2013

This figure shows the student contexts with the highest number of institutions of higher education in dark green and the lowest number of institutions within proximity in light green.

Figure 7

Bachelor's or Higher Density within Student Contexts



Data Sources: SCC Institutional Data – 2013 Cohort; ACS 5-Year Estimates 2013

Educational attainment in terms of population estimates of those age 25 or older with a bachelor's degree or higher by student context. Higher populations of bachelor's degree attainment are in dark green.

However, the more relevant metric for this research was the educational attainment within student contexts in relation to other student contexts in order to see if those with more proximal opportunity, broadly defined, were associated with higher levels of 3-year transfer than those with comparatively lower levels of educational opportunity, in this case, educational attainment in their area. Therefore, I identified the highest number of people estimated to have bachelor's degrees or above within a 5-mile radius of a student's home (290,735) and divided all aggregated educational attainment estimates within each 5-mile buffer by the highest number to result in values 0 to 1 for each student with 1 equating to the highest educational attainment and 0 the lowest educational attainment area when compared to all other student contexts. This also standardized the units for the next step of creating the index to combine higher education opportunity in terms of the institutions within student proximity.

The opportunity for college education provided by institutions within each student context was based on five indicators:

- Presence in the community (at least some in-person programs)
- Undergraduate enrollment 500+
- Bachelor's or above granting institution
- Public institution
- High transfer-in rate (20%+)

Students received one point for each indicator associated with each institution within their spatial context. For example, if a student lived within a 5-mile radius of just one institution but that

institution was UCLA, they would receive an overall institutional score of 5 points. If another student lived within 5 miles of California State University, Los Angeles and East Los Angeles College, they would have a total of 8 points. Similar to the educational attainment variable described above, the institutional characteristics points were then standardized into a score from 0 to 1 with a score of 1 indicating the maximum institutional characteristic points that an SCC student had in their vicinity.

Presence in the community was selected so that a) each institution included in the analysis would receive at least one point and b) to account for the importance of the presence of institutions with in-person offerings in the community. Undergraduate enrollment of 500+ and Bachelor's or Above were determined following a review of the characteristics of the myriad institutions that could be included in the dataset as I wanted to give weight to the potential for a student to benefit from undergraduate enrollment at the institution in the context of college opportunity. Public institutions of higher education received a point as a preliminary attempt to account for accessibility and potentially lower cost of attendance. Finally, institutions with high transfer-in rates received a point with the measure of "high" defined by IPEDS as 20% or higher to account for accessibility of 4-year institutions at the stage of transfer.

Table 5

Geography of College Opportunity Indicators for Students who Transferred within 3 Years (n = 412)

	Median	Mean	SD	Min	Max
Number of Institutions of Higher Education within Proximity	5	5.82	3.95	0	20
Sum of Higher Education Institution Characteristic Points	13	14.03	8.68	0	42
Score for Adults 25+ with Bachelor's Degree or Above within Proximity	0.424	0.411	0.152	0.004	0.952
Score for Institutional Characteristics within Proximity	0.283	0.305	0.189	0	0.913
Geography of College Opportunity Index	0.349	0.358	0.161	0.002	0.894

When looking at the geography of college opportunity that surrounded the students who transferred from SCC within three years, we see in Table 5 that on average students had approximately 6 institutions of higher education in their vicinity. The institutions within a 5-mile radius for this subgroup varied widely with some students having 0 institutions in their vicinity to others living within 5 miles of up to 20 institutions of higher education.

As shown in Table 5, the average score for students who transferred within three years based on the college opportunity that surrounded them was 14 with a range of 0 to 42. The range for the overall sample was 0 to 46. Students within this subgroup varied in their proximity to

institutions and institutional characteristics. Further analysis showed that students who did not transfer within 3 years had, on average, higher institutional scores (16.44) compared to students who transferred within 3 years (14.03) suggesting that those who transferred may have been surrounded with lower levels of educational opportunity on average when compared to their counterparts.

In order to create the geography of college opportunity index, I calculated the average of the educational attainment score and the institutional characteristics score. Students who transferred within three years show on average a GCO Index score of 0.358, indicating medium-low levels of college opportunity within their spatial contexts in comparison to the cohort. However, there is a wide range of scores within this subgroup of students so any given student who transferred within three years might have a GCO Index score of as low as 0.002 or as high as 0.894.

In order to further our understanding of the geography of opportunity that surrounds students who transfer, I conducted a 2-way crosstabulation and correlation analysis between a variable indicating whether or not a student transferred (xfer_within_3yrs) and variables representing the GCO Index scores. For the crosstabulation, I grouped the GCO Index scores into Low, Medium, and High ordinal categories with 1 indicating relatively lower opportunity and 3 indicating relatively higher opportunity. As shown in Table 6, the analysis shows that 15.5% of students with lower levels of college opportunity in their vicinity transferred within 3 years, compared to 14.0% of students from medium opportunity contexts, and 8.7% of those from areas with comparatively high levels of geography of college opportunity. Next, I generated a Pearson's correlation analysis between the continuous variable gco_index (ranging from 0 to 1) and xfer_within_3yrs. The two variables have a weak negative relationship (-0.052) which is

statistically significant at the 0.01 level. In other words, students who transferred within three years were associated with lower levels of geography of college opportunity and students who did not transfer within three years were associated with higher levels of geography of college opportunity.

Table 6

GCO Index by 3-Year Transfer

	% Transferred within 3 years	Chi-Square	Pearson's Correlation
GCO Index			
gco_index_group * xfer_within_3yrs		7.416*	
Low = .00 to .32	15.5%		
Med = .33 to .66	14.0%		
High = .67 to 1.00	8.7%		
gco_index * xfer_within_3yrs			-0.052**

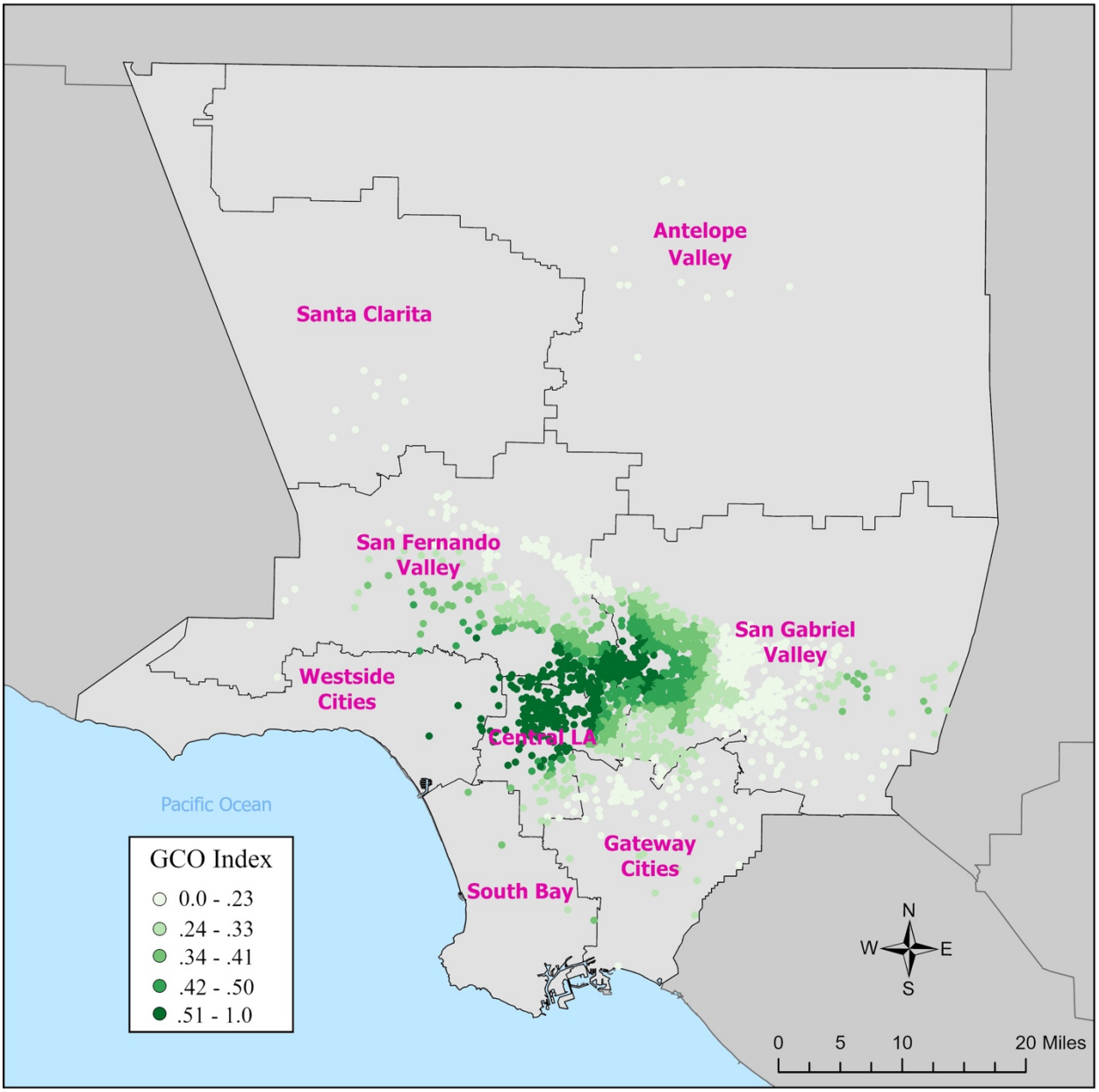
* Significant at the 0.05 level (2-tailed)

** Significant at the 0.01 level (2-tailed)

In order to visually represent the geography of college opportunity for students who transferred within 3 years, Figure 8 shows the GCO Index score assigned to each student in the 2013 SCC cohort (n = 2,907). While the GCO Index score was calculated accounting for the 5-mile buffer surrounding each student, it is represented here as a point in order to more clearly show the clustering of high opportunity (dark green) found for students who lived in the Central LA region.

Figure 8

Geography of College Opportunity by Cohort Student Contexts (n = 2,907)

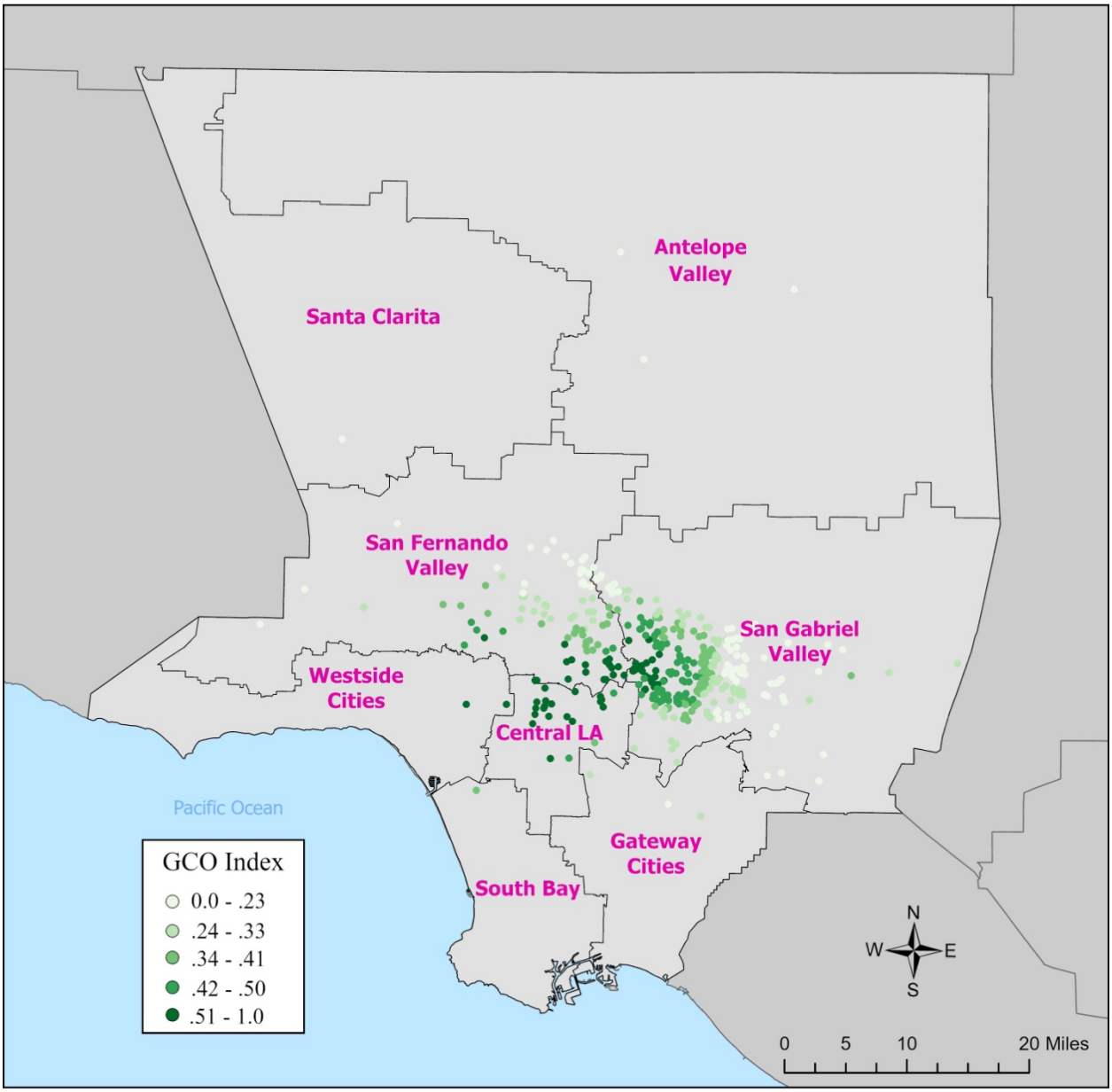


Data Sources: SCC Institutional Data – 2013 Cohort; IPEDS 2013; ACS 5-Year Estimates 2013

Filtering specifically for the 412 students who transferred within three years, we see a similar pattern of geography of college opportunity.

Figure 9

Geography of College Opportunity by 3-Year Transfer Student Contexts (n = 412)

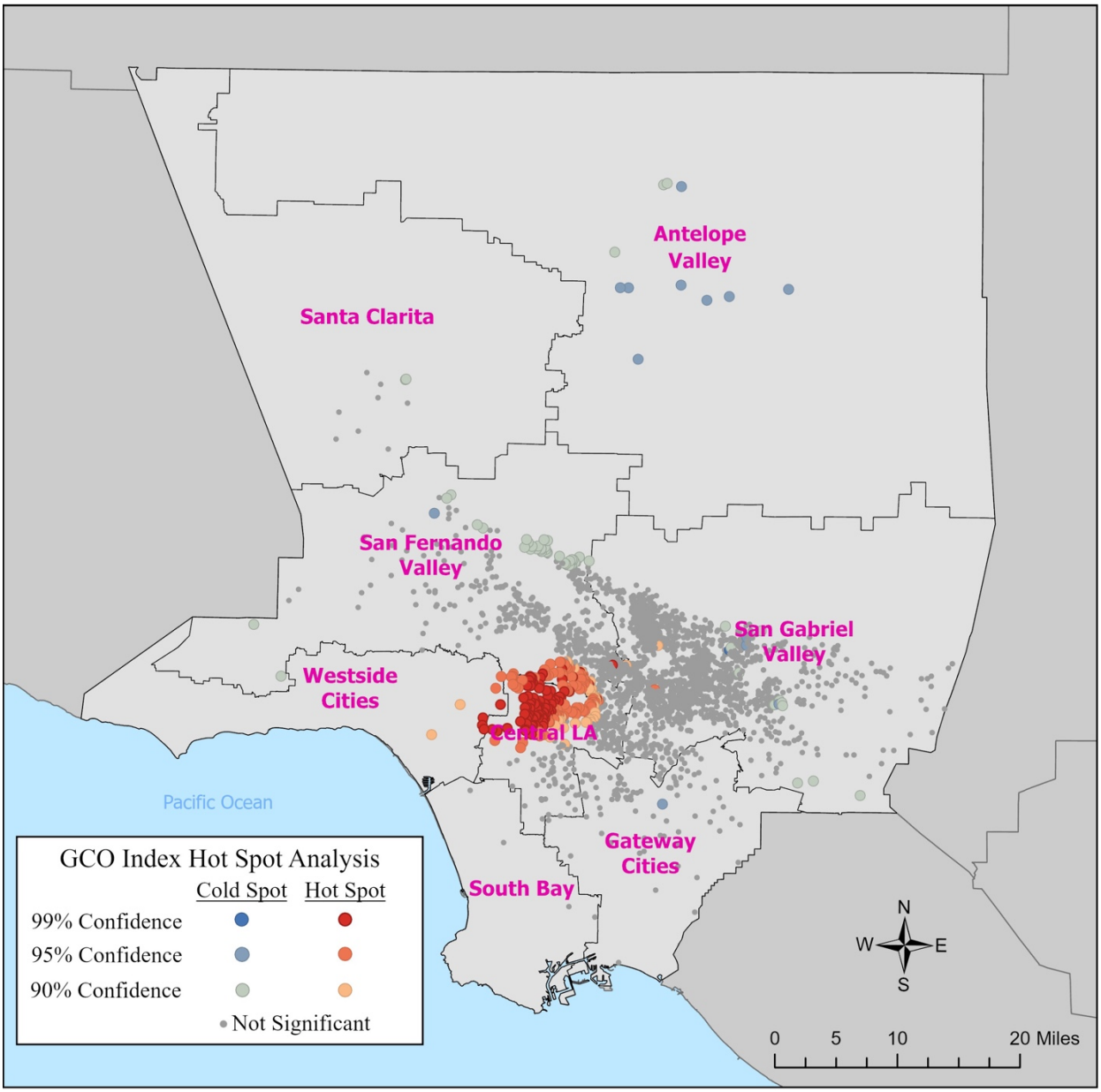


Data Sources: SCC Institutional Data – 2013 Cohort; IPEDS 2013; ACS 5-Year Estimates 2013

Finally, I conducted a hot spot analysis in ArcGIS to see if we can identify student contexts which have higher geography of college opportunity. As Figure 10 shows, the 5-mile buffers for students who live within or near the Central LA region are hot spots for higher levels of geography of college opportunity. Several of the students who commuted from the Antelope Valley region of LA County were associated with 5-mile buffer cold spots for GCO.

Figure 10

Hot Spot Analysis for GCO Index (n = 2,907)



Data Sources: SCC Institutional Data – 2013 Cohort; IPEDS 2013; ACS 5-Year Estimates 2013

Research Question 2: Is there a relationship between geography of college opportunity and 3-year transfer?

In order to inform our understanding of the geography of college opportunity as it relates to 3-year transfer, I conducted a 2-way cross tabulation of the variables of interest which I recoded for analysis. In addition, I generated and interpreted the correlation coefficients for the variables calculated in ArcGIS which had varying ways of representing geography of college opportunity in comparison to the dependent variable of 3-year transfer. Combined, these descriptive and inferential statistics help shed light on the research question and subquestions and lead into the next chapter where we discuss how these findings contribute to the understanding of the concept of geography of college opportunity in relation to transfer.

Research Question 2a: To what extent does 3-year transfer success vary by local access to higher education?

I analyzed two variables in relation to 3-year transfer success in order to shed light on how transfer might vary by local access to higher education: 1) The sum of institutions within each student's 5-mile radius and 2) the standardized score representing the institutional characteristic points within student contexts. The first variable, inst_sum, was calculated in ArcGIS by plotting the higher education institutions from IPEDS, creating a 5-mile buffer for each student, overlaying the institution points with the student context polygons, and conducting a spatial join which provided a sum of the number of institutional points within each 5-mile buffer. The calculation of the second variable, prox_inst_score, is detailed in Figure 5 as the Student Context Institutional Characteristics Score / Cohort Max Institutional Characteristics Score. This variable had a range from 0 to 1 with 1 representing the highest surrounding

opportunity as defined by institutional characteristics in relation to all other students in the cohort.

Both variables were transformed into ordinal low, medium, and high groupings in order to use a 2-way crosstabulation to explore them in connection with 3-year transfer. To show one measure of college opportunity in the sense of local access to higher education, the variable inst_sum_group was assigned values of 1-3 with 1 indicating a low number of institutions within a student's vicinity and 3 indicating high institutions within the vicinity. The crosstabulation between xfer_within_3yrs and inst_sum_group showed that among those students who were surrounded by fewer institutions of higher education, 18.0% transferred within 3 years (see Table 7). Of those with 5-8 institutions in proximity, 13.0% transferred. Their peers who were surrounded by the highest number of institutions transferred at a rate of 11.4%. This suggests that students with less institutions of higher education surrounding them may be more likely to transfer within 3 years.

Table 7

GCO Indicators by 3-Year Transfer – Local Access to Higher Education

	% Transferred within 3 years	Chi-Square	Pearson's Correlation
Sum of Institutions within Proximity			
inst_sum_group * xfer_within_3yrs		17.720***	
Low = Less than 5	18.0%		
Med = 5 to 8	13.0%		
High = Greater than 8	11.4%		
inst_sum * xfer_within_3yrs			-0.084**
Institutional Characteristics Score			
prox_inst_score_group * xfer_within_3yrs		25.656***	
Low = .00 to .32	17.1%		
Med = .33 to .66	11.2%		
High = .67 to 1.00	8.6%		
prox_inst_score * xfer_within_3yrs			-0.089**

** Significant at the 0.01 level (2-tailed)

*** Significant at the 0.001 level (2-tailed)

Next, I examined prox_inst_score_group which was also recoded with values 1 to 3. A value of 3 indicated the maximum college opportunity surrounding students in the cohort as defined by their institutional characteristics score. The proxinstscore_group variable showed a similar pattern as the inst_sum_group. Of those students who lived in proximity to the lower college opportunity as defined by institutional characteristics, 17.1% transfer within 3 years. Those with medium levels of proximal college opportunity transferred at a rate of 11.2%.

Finally, 8.6% of those with the highest levels of college opportunity surrounding them transferred within 3 years.

Following the 2-way crosstabulations, I examined the correlation coefficients for the ungrouped variables. As shown in Table 7, inst_sum produced a correlation coefficient of -0.084 indicating a weak negative relationship with 3-year transfer significant at the 0.01 level. In other words, students who transferred within three years were more likely to be within proximity of fewer institutions of higher education than their counterparts who did not transfer within three years. Turning next to the prox_inst_score, we see that a similar correlation coefficient of -0.089 shows a weak negative relationship with those who transferred within three years which is also significant at the 0.01 level. This suggests that even when accounting for a more nuanced view of the college opportunity that surrounds a student by including the characteristics of the institution, the relationship between this measure and the inst_sum measure reinforce a similar finding of a weak negative, though significant, relationship.

Research Question 2b: To what extent does 3-year transfer success vary by closeness to SCC?

I analyzed two variables in relation to 3-year transfer success in order to answer this research question: 1) Distance from home to SCC in miles and 2) whether SCC was the closest community college to the student. These variables were calculated in ArcGIS using geocoded student addresses from SCC and the geocoded locations of all California Community Colleges from IPEDS. In order to calculate distance from home to SCC, I developed a base map with publicly available shapefiles (see Appendix B), plotted the student locations and SCC, and conducted a near analysis in ArcGIS. As detailed in Table 4, the calculation resulted in a value indicating the distance from SCC ranging from 0.1 to 37.6 miles. In order to calculate whether

SCC was the community college in closest proximity to the student, I plotted the CCC locations and conducted a near analysis with student locations in ArcGIS, exporting the institution name and distance to the closest community college by student (ranging from 0.1 to 15.7 miles) for further manipulation in R. I then created a new variable with a value of 1 if the closest community college to the student was SCC and a value of 0 if a different community college was closer.

I first transformed the home2scc variable into home2scc_group with values of 1 to 3 indicating low, medium, and high distance from a student's home to Sunshine Community College. I then explored xfer_within_3yrs and home2scc_group with a cross tabulation analysis in SPSS (see Table 8). Among students who lived less than 4 miles away from SCC, 14.4% transferred. Those who traveled longer distances to attend SCC (4-8 miles) transferred within 3 years at a higher rate of 17.3%. However, those who lived the furthest away from SCC at over 8 miles transferred at a rate of 10.6%.

Table 8

GCO Indicators by 3-Year Transfer – Closeness to SCC

	% Transferred within 3 years	Chi-Square	Pearson's Correlation
Distance to SCC			
home2scc_group * xfer_within_3yrs		19.746***	
Low = Less than 4 miles	14.4%		
Med = 4 to 8 miles	17.3%		
High = Greater than 8 miles	10.6%		
home2scc * xfer_within_3yrs			-0.035
SCC Closest Community College			
closest_cc * xfer_within_3yrs		10.095***	
0 = Lived closer to another CC	12.7%		
1 = SCC was the closest CC	17.0%		
closest_cc * xfer_within_3yrs			0.059**

** Significant at the 0.01 level (2-tailed)

*** Significant at the 0.001 level (2-tailed)

I also ran a cross tabulation analysis on xfer_within_3yrs and closest_cc which was already coded as a binary variable as mentioned above. I found that students who lived closest to SCC - in the sense that SCC was the closest community college to them - successfully transferred to a four-year institution within three years at a rate of 17.0%. In comparison, 12.7% of students who went out of their way to attend SCC - in the sense that another community college was closer to them - transferred to a four-year institution within 3 years.

Finally, I explored the correlation coefficients for each pair of variables. There does not appear to be a significant relationship between the home distance to SCC and transfer within three years. However, the analysis shows a weak positive correlation between closest_cc and xfer_within_3yrs (0.059) which is statistically significant at the 0.01 level. In other words, students for whom SCC was the closest community college were more likely to transfer within 3 years when compared to their counterparts who traveled out of their way to attend SCC.

In the chapter that follows, we will discuss the implications of these findings and provide some concluding thoughts including areas for future research.

CHAPTER 5: DISCUSSION & CONCLUSION

In this chapter we discuss the findings outlined in Chapter 4 including how they expand our understanding of the concept of geography of college opportunity and implications for policy and practice. Next, we suggest areas for future research to further our understanding of the geography of opportunity for transfer. Finally, I provide some concluding thoughts regarding the more recent context of shifts in enrollment and modes of instruction in relation to the COVID-19 pandemic.

Discussion of Results

Research Question 1: What is the geography of college opportunity that surrounds students who transfer within 3 years?

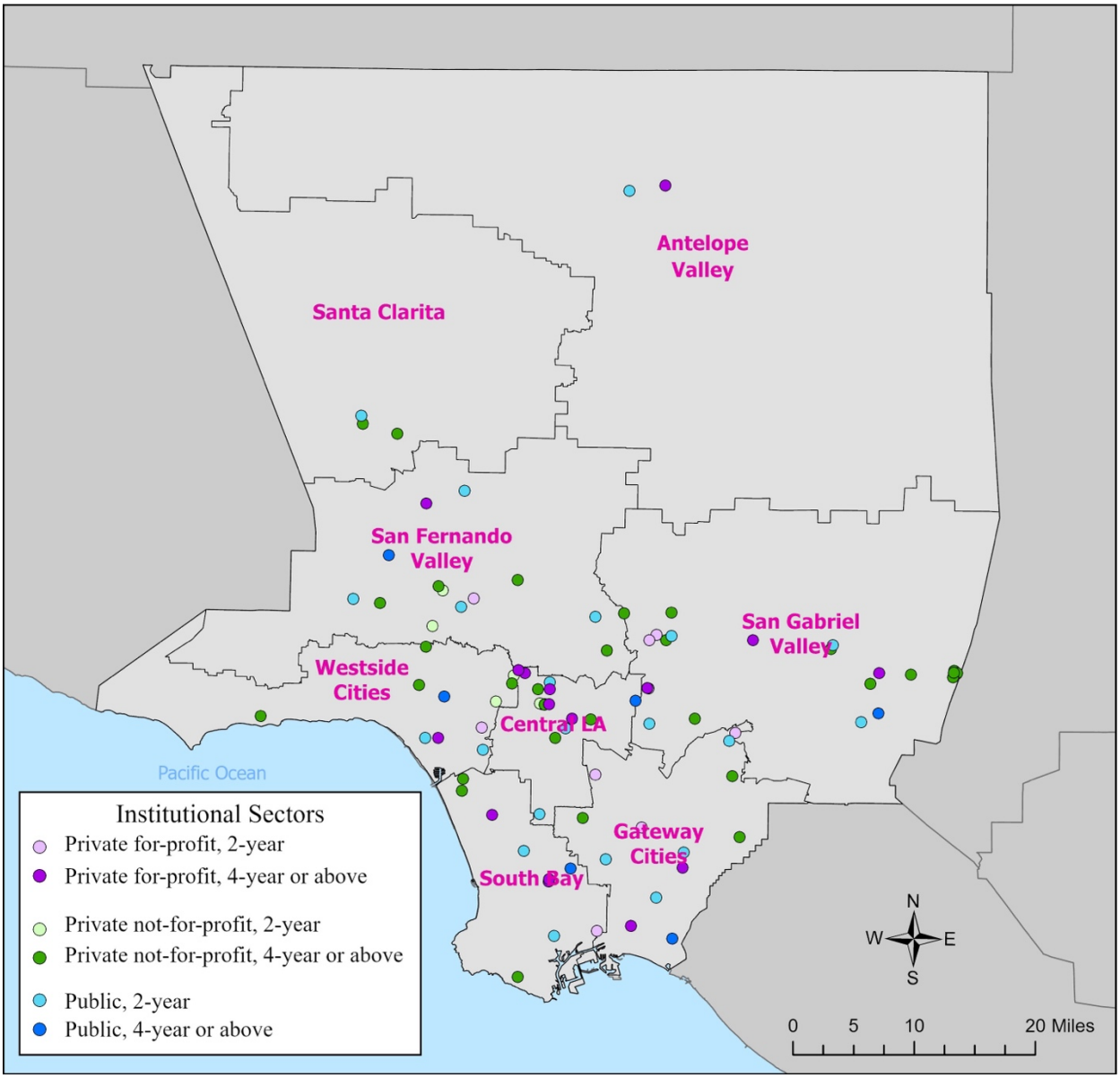
Students who transferred within three years had low-medium GCO Index scores of 0.358 on average (see Table 5). In fact, 43.4% of those who transferred within three years were students affiliated with low levels of GCO. Lower levels of GCO associated with higher levels of transfer suggest a few considerations as we seek to better understand geography of college opportunity in relation to transfer. First, the inclusion of for-profit institutions in the calculation of opportunity without accounting for graduation rates or average debt, for example, may have led to the creation of an index for college opportunity that was skewed by purported opportunity. The index could have been skewed by the appearance of opportunity as some of the Corinthian Colleges were still open during 2013 and receive points in the analysis (e.g., Everest College). Appendix C details each institution included in the analysis and the number of points they received on the institutional characteristics scale. In addition, Figure 11 visualizes the distribution of institutions by sector within LA County. It appears that the area showing as a hot

spot for opportunity has several for-profit institutions in the vicinity. While those institutions may have provided college opportunity for some students at the time, since 2013 we have seen the closure of many for-profit institutions in California due to "predatory" practices[4]. That is to say that a college opportunity index may look different when removing for-profit institutions from the analysis.

[4] https://oag.ca.gov/corinthian

Figure 11

Institutions of Higher Education by Sector in LA County (n = 93)



Data Source: IPEDS 2013

Taking into account the variables that contributed to the GCO Index however, we can extrapolate some interesting points about the relationship between spatial context and transfer. Half of the GCO Index Score was made up of the educational attainment that surrounded

students. We also know that students go out of their way to attend this institution with above average transfer rates. Students who transferred within three years lived 6.8 miles from SCC and 3.5 miles from the closest community college on average (see Table 4). So, if the students who go out of their way to attend SCC are resourceful and knowledgeable about transfer and that is met with resources from the institution to transfer, we could see students from areas with lower educational attainment persisting toward timely degree completion at higher rates than their peers. In addition, if students with lower GCO scores were also further away from the institution they may have been more motivated to ask to seek support to navigate course enrollment as efficiently as possible due to the heavy toll a long commute can take on quality of life. Students with lower GCO scores may have been closer to the institution and in areas not deemed hot spots for for-profit institutions to blossom. Finally, this study focused on transfer but there may have been students who attended SCC with particular interest in earning a degree that could provide access to a local career path as opposed to transfer to a four-year institution outside of their home area. Future research should explore these areas in more depth with longitudinal, qualitative, and statewide data to shed additional light on how we might refine our calculations for a more precise GCO Index and what might explain a negative relationship between GCO and transfer.

Research Question 2: Is there a relationship between geography of college opportunity and 3-year transfer?

There is a weak - yet statistically significant – negative relationship between 3-year transfer and two indicators of geography of college opportunity: the number of institutions within student contexts and the institutional characteristics scores associated with student contexts. Students who are surrounded by fewer institutions of higher education have higher 3-

year transfer rates and students who have more institutions of higher education in their vicinity have lower transfer rates. This pattern holds true when accounting for the five institutional characteristic scores. This suggests that less institutions within a students' vicinity could indicate more opportunity depending on the institutional type. Those students who have less institutions surrounding them may live in areas with less for-profit institutions which have been known to target less affluent areas. Therefore, the sum of institutions surrounding a student might be expected to have a negative relationship with transfer. The institution score should show a more nuanced take on the opportunity provided by the institutions so, given that it follows the same pattern, we suggest future research account for other variables such as the socioeconomic characteristics of a student's context to shed light on whether that may be a confounding factor.

In addition, there is a weak positive relationship with the GCO indicator of whether SCC was the closest community college to home. Students for whom SCC was the closest community college were more likely to transfer within 3 years when compared to their counterparts who traveled out of their way to attend SCC. Distance to SCC and 3-year transfer do not show a statistically significant relationship. This complicates our initial thoughts on the research question above. Students who went out of their way to attend SCC transferred at a rate of 12.7% compared with a 17.0% transfer rate for those who attended the community college closest to them (see Table 8). This suggests that there may be additional nuance to uncover in terms of the GCO Index scores surrounding SCC in particular. In general, the evidence of a relationship between the closest community college indicator and 3-year transfer suggests that students who live closer have a higher chance of transferring. This makes some intuitive sense in terms of how students spend their time–less time spent on commuting can mean more time engaged in academics–but also may indicate students who live at home and are younger especially given the

demographics of the cohort detailed in Table 1. Future research might explore if the geography of college opportunity that surrounds such students is even more salient because it also represents the context they grew up in. It is also worth noting that just because a community college is open to all students who can get to it does not mean that all students will be able to benefit from equitable experiences without specific intervention, especially for those who spend large amounts of time commuting to and from college.

Implications for Policy and Practice

With that we turn to some implications for policy and practice. First, recall that students from Asian, Latina/o/x, and White non-Hispanic backgrounds accounted for 94.2% of those who transferred from SCC within three years though just 88.8% of the cohort of interest (see Table 1). Furthermore, while Latina/o/x students accounted for over half of the entering cohort (53.6%), they only accounted for a quarter of those who transferred within three years (26.2%). Generating some basic descriptive statistics on the demographic backgrounds of those who transfer in relation to the overall entering cohort can generate insight even for institutions with relatively high transfer rates as they seek to equitably support all students in reaching their transfer goals.

As we seek to improve efforts to support students in their persistence toward timely and cost-effective degree attainment, we may wish to consider using terminology other than "2-year institutions" to refer to community colleges as it can be misleading. Some community colleges within California now offer bachelor's degrees, making them effectively 4-year institutions in IPEDS. More importantly, they are offering pathways to the baccalaureate that are geographically accessible to students who are rooted in their communities. The expansion of

such programs could provide unprecedented access to four-year degrees and serve the specific labor market and economic needs of California. Providing additional opportunity for students within the 100+ community colleges that already exist such as investments to support timely transfer pathways throughout CCCs so that students do not need to go out of their way to enhance their chances of transfer could benefit the individual students and the multiple systems of higher education in the state as there are increasing calls to provide access to four-year institutions through transfer.

Economic Opportunity and College Opportunity

The intersection of the economics of college opportunity and the geography of college opportunity, while not the focus of the study, warrants further discussion. The findings show high GCO Index scores for students who live in more economically challenged areas of LA County such as Central Los Angeles (Matsunaga, 2009). High GCO Index Scores should be interpreted with caution as they are not equivalent to greater access and privilege overall. Students who are surrounded by institutions of higher education do not necessarily consider the institutions within their proximity to be affordable or of the best value given their economic means (see Iloh & Tierney, 2014). While the GCO Index recognizes the benefits of public not-for-profit institutions of higher education, future research should additionally consider the net costs to students of both public and private colleges and universities.

Students may also attend community college with a goal of transfer to a four-year institution and be surrounded by proximal access to higher education but there remains the complicating factor of the individual's economic capacity to pursue a bachelor's degree. As discussed earlier, it takes some time for students to transfer from community colleges, if at all. The students in this study transferred within three years, leaving some remaining eligibility for

Pell Grants and other aid. However, the time in school comes with both economic and personal trade-offs (Morton, 2019). As shown in Table 1, 65.0% of students who transferred received need-based aid in comparison to 77.4% of those who did not transfer within three years. Further exploration into the economic circumstances of students may shed light on how they factor in to eventual transfer success.

Areas for Future Research

Future research should explore a further nuanced definition of geography of college opportunity. For instance, Euclidean distance was used to determine the distances between points. However, a network analysis could account for the nuance in travel times. For instance, it is possible that an institution appeared to be closer than another, but the average commute time might be further away. In addition, included in the GCO Index Scores were institutions of higher education within the for-profit sector. Future research may want to explore a similar GCO Index without the presence of for-profit institutions as they may have skewed the opportunity that appeared to be evident in an area. For instance, Appendix C shows the list of institutions with their associated scores and institution types. Students who lived in the vicinity of some for-profit institutions may have had the opposite of opportunity as many for-profit institutions have been flagged for predatory practices. Future research may also want to account for the opportunity that surrounds students who live on the boundaries of LA County because their opportunity may extend to the 5-mile radius that encompasses areas in a different county.

This study focused on exploring student-level 3-year transfer for a cohort of students who started their studies at SCC in Fall 2013 in relation to their spatial contexts. Future research

should control for student demographics such as age or whether a student attended full-time with multiple cohorts of students. Additionally, the student voice is vital in understanding the geography of opportunity for transfer in further depth. While it appeared that two-thirds of students traveled out of their way to attend SCC, interviews with students could shed light on the decision to attend SCC over other institutions in their area. Students might, for example perceive SCC to be within their spatial context if it is within proximity to other areas of interest for the student such as an in-person workplace. Future research could also include students under 18 years of age and include their educational opportunity in connection with the high schools they attended. We might expect more affluent areas to be associated with higher college opportunity. So those who live in close proximity to an institution with high transfer rates may have the privilege of not only proximity to college (saving money living at home, minimal commute time, etc.) but also the advantages that come with being able to live in an affluent area (high school quality, family education and income, etc.) so they will thrive. On the other hand, the drive and resilience we see from student populations from less affluent areas who despite the odds do everything they need to in order to navigate the community college system including going out of their way to attend one associated with higher transfer rates may result in a higher transfer rate for students from traditionally underserved backgrounds even though they must travel for that opportunity. On the other end of the research, we could also look at transfer with more nuance including where the students ultimately transferred.

A quantitative analysis of the geography of college opportunity in Los Angeles may yield interesting results but without a deeper glance into the personal decision-making processes of students who experience the context, we are left to interpret the results without ever having insight into how this plays out for individuals. Combining both approaches within a mixed

methods study would help reach the more nuanced experiences and the broader context and enables the purposeful integration of the data which can result in additional findings. Finally, as the 3-year transfer data becomes available for Fall 2020, it would be interesting to see how the relationship between spatial contexts and 3-year transfer changed in the face of many institutions shifting to online learning due to the COVID-19 pandemic.

Concluding Thoughts

Geography of college opportunity can be operationalized in incredibly nuanced ways. The researcher must define the context of interest. In this case, student contexts included a 5-mile radius from the home address, but a number of other contexts were considered along the way. Neighborhoods, while arguably more relevant to the individual than a census tract for instance, had tremendous appeal at first. However, it did not make logical sense to fail to count an institution within, for instance, 1 mile of a student simply because the institution was technically located in a different neighborhood. A 5-mile radius would account for all of the surrounding institutions but would present new challenges. For those students who lived on the border of LA County for instance, the 5-mile radius would reach into the border of another county for which neighborhood boundaries were not available. In addition, the researcher must define how the opportunity index is calculated, which institutions to include or exclude, and how to calculate transfer for the population of interest. I, for instance, selected the Fall 2013 entering cohort of students from one community college which allowed for the possibility of future research exploring this cohort in longitudinal depth without running into the COVID-19 pandemic. However, some institutions report transfer rates not in terms of entering cohorts but in terms of the number of students who transferred in any given year. Thus, the data can be

reviewed from a number of perspectives to provide further insight into our understanding of the geography of college opportunity for transfer.

In conclusion, when the pandemic hit, I was studying at UCLA having just advanced to candidacy and living 300 miles from my hometown. The isolation of living in a city with so many people that I could not safely interact with while being away from home did not seem worth it. I am now finishing my doctoral degree from my hometown. I am getting some of that education I so wish I had, from home. To be able to complete a PhD from my hometown, a place with no option for a PhD, is incredibly meaningful for someone interested in the geography of college opportunity. I know it is possible for people to get the education they need from where they need it. We should all be so fortunate to not have to sacrifice our connections, our well-being– the very things that make us the whole humans we are–in order to engage in the education we want and deserve.

APPENDICES

Appendix A. Descriptive Breakdown of Grouped Continuous Variables

	Median	Mean	SD	Min	Max
Age					
Cohort	18	19.7	4.7	18	66
Transferred within 3yrs	18	18.8	2.4	18	38
Did Not Transfer within 3yrs	18	19.8	4.9	18	66
GPA					
Cohort	2.00	2.01	1.0	0	4
Transferred within 3yrs	3.09	2.96	0.7	0	4
Did Not Transfer within 3yrs	1.83	1.85	0.9	0	4
Units Attempted					
Cohort					
Transferred within 3yrs	81	77	27.4	12	192
Did Not Transfer within 3yrs	56	63	37.7	12	170

Appendix B. Data and Shapefile Sources

California Community Colleges Chancellor's Office
Management Information Systems Data Mart
https://datamart.cccco.edu/

U.S. Census
American Community Survey (ACS) 2013 5-Year Estimates
https://www.census.gov/

California Community Colleges LaunchBoard
Student Success Metrics
https://www.calpassplus.org/LaunchBoard/Student-Success-Metrics

U.S. Census
TIGER/Line Shapefiles
https://www.census.gov/cgi-bin/geo/shapefiles/index.php

County of Los Angeles
Enterprise GIS
https://egis-lacounty.hub.arcgis.com/

California Open Data Portal
https://data.ca.gov/dataset/ca-geographic-boundaries

National Center for Education Statistics
Integrated Postsecondary Education Data System (IPEDS), 2013
https://nces.ed.gov/ipeds/

Sunshine Community College
Student-Level Data, 2013 Cohort

Appendix C. Opportunity Scores for Institutions of Higher Education in LA County (n=93)

Institution Name	In-person	UG 500+	Bach+	Public	High Xfer-in	Instit. Char. Score
Public 2-year						*Mean = 3*
Antelope Valley Community College District	1	1	0	1	0	3
Cerritos College	1	1	0	1	0	3
Citrus College	1	1	0	1	0	3
College of the Canyons	1	1	0	1	0	3
Compton College	1	1	0	1	0	3
East Los Angeles College	1	1	0	1	0	3
El Camino Community College District	1	1	0	1	0	3
Glendale Community College	1	1	0	1	0	3
Long Beach City College	1	1	0	1	0	3
Los Angeles City College	1	1	0	1	0	3
Los Angeles Harbor College	1	1	0	1	0	3
Los Angeles Mission College	1	1	0	1	0	3
Los Angeles Pierce College	1	1	0	1	0	3
Los Angeles Southwest College	1	1	0	1	0	3
Los Angeles Trade Technical College	1	1	0	1	0	3
Los Angeles Valley College	1	1	0	1	0	3
Mt San Antonio College	1	1	0	1	0	3
Pasadena City College	1	1	0	1	0	3
Rio Hondo College	1	1	0	1	0	3
Santa Monica College	1	1	0	1	0	3
West Los Angeles College	1	1	0	1	0	3
Public, 4-year or above						*Mean = 4.5*
California State Polytechnic University-Pomona	1	1	1	1	1	5
California State University-Dominguez Hills	1	1	1	1	0	4
California State University-Long Beach	1	1	1	1	1	5
California State University-Los Angeles	1	1	1	1	0	4
California State University-Northridge	1	1	1	1	0	4
University of California-Los Angeles	1	1	1	1	1	5

Institution Name	UG In-person	UG 500+	Bach+	Public	High Xfer-in	Instit. Char. Score
Private for-profit, 2-year						*Mean = 1.5*
Advanced College	1	0	0	0	0	1
American Career College-Los Angeles	1	1	0	0	0	2
Concorde Career College-North Hollywood	1	1	0	0	0	2
Everest College-City of Industry	1	1	0	0	0	2
Everest College-LA Wilshire	1	0	0	0	0	1
Everest College-West Los Angeles	1	0	0	0	0	1
ICDC College	1	1	0	0	0	2
Le Cordon Bleu College of Culinary Arts-Pasadena	1	1	0	0	0	2
Los Angeles College of Music	1	0	0	0	0	1
Pinnacle College	1	0	0	0	0	1
Wyotech-Long Beach	1	1	0	0	0	2
Private for-profit, 4-year or above						*Mean = 2.2*
American University of Health Sciences	1	0	1	0	0	2
Argosy University-Los Angeles	1	0	1	0	0	2
Argosy University-The Art Institute of California-Hollywood	1	1	1	0	0	3
Argosy University-The Art Institute of California-Los Angeles	1	1	1	0	0	3
Bryan University	1	1	0	0	0	2
FIDM-Fashion Institute of Design & Merchandising-Los Angeles	1	1	0	0	0	2
Fremont College	1	0	0	0	0	1
ITT Technical Institute-San Dimas	1	1	0	0	0	2
ITT Technical Institute-Sylmar	1	1	0	0	0	2
ITT Technical Institute-Torrance	1	0	0	0	0	1
Los Angeles Film School	1	1	0	0	0	2
Mt Sierra College	1	1	1	0	0	3
Musicians Institute	1	1	0	0	0	2
Platt College-Los Angeles	1	1	0	0	0	2
University of Antelope Valley	1	1	0	0	0	2
West Coast University-Los Angeles	1	1	1	0	0	3
Westwood College-Los Angeles	1	1	1	0	0	3
Westwood College-South Bay	1	1	1	0	0	3

Institution Name	In-person	UG 500+	Bach+	Public	High Xfer-in	Instit. Char. Score
Private not-for-profit, 2-year						*Mean = 1.2*
American Academy of Dramatic Arts-Los Angeles	1	0	0	0	0	1
Casa Loma College-Van Nuys	1	1	0	0	0	2
CBD College	1	0	0	0	0	1
Los Angeles ORT College-Los Angeles Campus	1	0	0	0	0	1
Los Angeles ORT College-Van Nuys Campus	1	0	0	0	0	1
Private not-for-profit, 4-year or above						*Mean = 2.8*
American Jewish University	1	0	1	0	1	3
Art Center College of Design	1	1	1	0	0	3
Azusa Pacific University	1	1	1	0	1	4
Biola University	1	1	1	0	1	4
California Institute of Technology	1	1	1	0	0	3
California Institute of the Arts	1	1	1	0	0	3
Charles R Drew University of Medicine and Science	1	0	1	0	0	2
Claremont McKenna College	1	1	1	0	0	3
Columbia College Hollywood	1	0	1	0	0	2
Harvey Mudd College	1	1	1	0	0	3
Life Pacific University	1	1	1	0	0	3
Loyola Marymount University	1	1	1	0	0	3
Marymount California University	1	1	0	0	0	2
Mount Saint Mary's University	1	1	1	0	0	3
Occidental College	1	1	1	0	0	3
Otis College of Art and Design	1	1	1	0	0	3
Pacific States University	1	0	1	0	0	2
Pepperdine University	1	1	1	0	0	3
Pitzer College	1	1	1	0	0	3
Pomona College	1	1	1	0	0	3
Providence Christian College	1	0	1	0	0	2
Scripps College	1	1	1	0	0	3
Southern California Institute of Architecture	1	0	1	0	0	2
The King's University	1	0	1	0	0	2
The Master's University and Seminary	1	1	1	0	0	3
University of La Verne	1	1	1	0	0	3
University of Southern California	1	1	1	0	1	4
University of the West	1	0	1	0	0	2
Whittier College	1	1	1	0	1	4
Woodbury University	1	1	1	0	0	3
World Mission University	1	0	1	0	0	2
Yeshiva Ohr Elchonon Chabad West Coast Talmudical Seminary	1	0	1	0	0	2

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