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Organized for Success? An Examination of Whether District Structures Relate to Institutional Efficiency and Student Success Among California's Community Colleges

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Organized for Success? An Examination of Whether District Structures Relate to Institutional Efficiency and Student Success Among California's Community Colleges

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requirements for the degree Doctor of Education

by

Sharon Beynon

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ABSTRACT OF THE DISSERTATION

Organized for Success? An Examination of Whether District Structures Relate to Institutional Efficiency and Student Success Among California's Community Colleges

by

Sharon Beynon

Doctor of Education

University of California, Los Angeles, 2018

Professor Mark Kevin Eagan, Chair

This study examined the impact on student success of district structure, organization and other institutional characteristics in California Community Colleges (CCCs). Controlling for institutional characteristics related to demographics of the student body, urbanicity, and institutional size, the study asked if the structure of the district (in which CCCs operate) accounts for variation in institutional student success measures. The study further asked whether student success significantly correlates with the proportion of a college's expenditures related to student instruction, the percentage of full-time faculty, or the ratio of faculty to administrators. Using Mintzberg's organizational structures as a theoretical framework, the study contrasted sing single-college districts (SCDs) and multi-college districts (MCDs). The research used data gathered from both California Community Colleges Chancellor's Office (CCCCO) DataMart, as well as from the Department of Education's Integrated Postsecondary Education Data System (IPEDS). The data was examined quantitatively using regression analysis, bi-variate correlation

analysis, *t*-tests, and *F*-tests. The study found a significant association between the type of district that a college belongs to and several measures of student success. The study also found a significant association between the percent of full-time faculty at the college and student success, and a significant association between the percent of the budget spent on instruction and student success. Outside of the research questions, the study also found a significant positive association between college size, as measured by full-time equivalent students (FTES), and student success and a significant negative association between the percent of students on BOG (Board of Governor's) waiver and student success.

Keywords. Community college, California, district type, district structure, student success, single-college district, multi-college district

The dissertation of Sharon Benyon is approved.

Robert Rhoads

Cecilia Rios Aguilar

Diane Durkin

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University of California, Los Angeles

2018

Dedication

This dissertation is dedicated to my mother, Victoria Beynon, and my late father, Dr. Eugene Thomas Beynon. What an honor to be born to parents who love their child's pilgrim soul.

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Acknowledgments

This study would not have been possible without the support of advisers, friends, and family.

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The professors and mentors at UCLA have given me insight and renewed passion for the world of community college education and the teaching profession. I want to especially thank Linda Rose for her confidence in me and her patient help in formulating meaningful research questions. Shan Boggs also deserves mention for her professionalism and kindness; she advocated for me when things were fraught due to the Thomas Fires in Ventura Country.

I wish to thank my husband, Alexander Kolesnik, for talking and talking and talking through the ideas related to this project. I am especially grateful for his help with the statistical analyses in this study. I first fell in love with him when he tutored me in an undergraduate stat class at UT Austin, back in the day. There has been no regression there, dear.

I wish to thank my mother, Victoria Beynon, for her enduring love, encouragement, and financial support in this endeavor. She and my late father, Thomas Beynon, gave me freedom to think for myself, a sense that life is an adventure, and a love for learning, travel, and people. In this project, I have taken my father's advice and ventured past fear to try something bigger than I thought I could accomplish.

I also thank my amazing children, Emma Beynon Kolesnik and Finn Beynon Kolesnik, who inspire me. I hope you both know that this was hard for me, but you buoyed me with your humor, your time, and your love. I look forward to having more time to play bridge with you both! Paisley Beynon, FP Beynon, and Harold Beynon also brought me comfort when I most needed it.

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EDUCATION

University of Texas at Austin, Austin, TX (1998-1999)
Masters of Education. Specialty in reading, language and literacy.

Region XIII, Teacher Preparation and Certification, Austin, TX (1994)
Area of certification: Secondary English. Certified in English, Social Studies, and Theater Arts.

Texas State University, San Marcos, TX (1992-1994)
Twenty-seven hours of graduate English classes, six hours of graduate psychology.

University of Texas at Austin, Austin, TX (1987-1991)
Bachelor of Arts degree in English. Honors: dean's list, University Interscholastic League Scholarship.

WORK EXPERIENCE

English Professor
Ventura College, Ventura, CA (2010-present)

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    - 2014-1015 Recipient for Academic Senate Award for Service to Faculty
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Tenured English Professor
Cuesta College, San Luis Obispo, CA (2006-2010)

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"The HIP Community College: Designing Professional Learning for Results"
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"Composition in the DE Classroom" Presentation
Distance Education Conference, Oceanside, CA (2008)
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Peer Review Panel Member
National Endowment for the Humanities, Washington, D.C. (2007)
Served as a panelist for the NEH's EDSITEment website, reviewing and evaluating educational sites.

Freelance Writer/ Independent Contractor for the Gale Group
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Wrote curriculum for on-line and print textbook publications, including units on five of Shakespeare's comedies, *The Iliad*, *Paradise Lost*, and *Gilgamesh*. These lessons included background material and activities for high school students.

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Texas Department of Education, Region V, Houston, TX (2002-2003)
Presented to educators at statewide conferences on best practices for incorporating ESL instruction techniques into mainstream English classes. Wrote extensive curriculum for teaching *The Odyssey* to ESL students in inclusion settings.

Chapter One: Introduction

Background

In 1910, Fresno housed the first California Community College (CCC) as an extension of its high school. By 1930, there were 35 CCCs across the state; by 1977, the number had grown to 104. State funding increased correspondingly--from several hundred dollars in 1910 to $10 million in 1950 and to more than $500 million in 1977 (Cothran, 1981). Now, 30% of American community college students (more than 2 million people) attend one of 114 California CCs. From its unassuming beginnings just over 100 years ago, the CCCs have become the largest system of higher education in the United States and one of the largest in the world (California Community Colleges Chancellor's Office [CCCCO], 2017c; National Center for Education Statistics, 2017).

The rapid increase in the number of campuses and districts has led to expansions and changes to the state and local boards that oversee the CCCs. When community colleges began, they were often extensions of the local K-12 system. They were small schools serving local areas with easily understandable organizations (Beach, 2012; Diener, 1986; Jones, 1968). Now representing a collective system with billions of dollars in funding and millions of students, California CCs have developed complex organizational structures, intricate funding formulas, and complicated governance arrangements (Aspen Institute, & American Association of Community Colleges. (2013a); Center for Community College Policy Education Commission of the States, 2000; McLendon, Hearn, & Mokher, 2009). What power rests with the state, the district, the community, and the college is often unclear even to those working within the system. Furthermore, how this structural diversity impacts students is unclear.

Rapid Growth Enables Varied Organizational Structures

CCCs are structurally complex for a few distinct reasons. First, these "people's colleges" were created to serve the needs of local students and industries. Like their K-12 counterparts, they respond to locally elected boards. For most of the 20th century, public junior colleges (as they were first called) and community colleges (as they were later called) were free to decide, without much state oversight, how to structure themselves and meet the needs of their communities (Cohen & Brawer, 2003). They were funded by their own tax bases and in many respects wrote their own rules. The missions of community colleges ranged from technical education to transfer education to non-credit adult education (Cohen & Brawer, 2003).

A second reason for the complex structure of the various community colleges has to do with the enormous growth community colleges experienced after World War II and into the 1960s and 1970s (Beach, 2012; Diener, 1986). California responded to the GI Bill and the Baby Boom by creating the California's Master Plan of 1960 (Douglass, 2000; Geiser & Atkinson, 2013). This plan included the CCCs as one of three parts of the state's vision for higher education, in addition to the University of California (UC) system, which has responsibility for doctoral education and advancing research while enrolling the top 12.5% of the state's high school graduates, and the California State University (CSU) system, which has a broad access mission, campuses that emphasize teaching over research, and confers bachelor's and master's degrees (California State Department of Education, 1960; Douglass, 2000).

With the inclusion of the community college sector, the California Master Plan codified the principle that every capable student should have access to at least 2 years of college (California State Department of Education, 1960; Douglass, 2000). The Master Plan resulted in significant change for community colleges, which were expected to expand and change to meet

the needs of their communities, as well as protect the selectivity and exclusiveness of the UCs and CSUs (Dougherty, 1994). Implementation of the California Master Plan served to catalyze CCCs to emerge as institutions where the majority of those enrolled in postsecondary education attended college with the least expense to the state budget (Center for Community College Policy Education Commission of the States, 2000; Murphy, 2004).

During these decades of expansion, local policymakers and administrators debated the most efficient ways to organize and govern California's increasing numbers of community colleges (CCs). Locally, some favored a district structure with greater centralization of decision-making and authority, while others advocated for a more decentralized approach that left more autonomy with individual campuses (Atherton, 1986; Jenkins & Rossmeier, 1974; Jones, 1968).

In their efforts to cope with the unprecedented growth of the CCs, policymakers and campus leaders experimented with various organizational structures across the California CC system. A central question they considered was whether several colleges should centralize at least some operations into a district office or whether it was better for colleges to maintain complete independence from a district-level layer of bureaucracy and coordination. Campuses also considered the very purpose of the community college: whether they should aim to educate students for the first 2 years of college (the junior college model), or prepare students for careers in the trades, or both (Diener, 1986; Dougherty, 1994). How California CCs answered these questions varied considerably by geographic region, and those regional decisions have resulted in more than half of the state's community colleges being organized in multi-college districts (MCDs), which are structured so that a board of trustees oversees a chancellor of a district who, in turn, oversees the presidents of the district's colleges.

The largest MCD in the country is the Los Angeles Community College District (LACCD) with nine colleges, each led by a separate president under a district-wide chancellor (Los Angeles Community College District, 2017). City College of San Francisco (CCSF), by contrast, is a single college district with 11 campus locations and a centralized administration (City College of San Francisco, 2017). A Chancellor/President oversees CCSF and reports to a District Board of Trustees. Under the Chancellor/President are several associate vice chancellors; deans head the various campus locations.

In between the Los Angeles MCD model and the San Francisco single-college district (SCD) model are various arrangements that reflect a cobbled system somewhat unified by a state chancellor's office (Atherton, 1986; Beach, 2012; CCCCO, 2017c). For example, some smaller SCDs like that of Cuesta College expanded as they saw the need, building a satellite campus and a satellite center in other parts of San Luis Obispo County (Cuesta College, 2017). Medium-sized MCDs like the one in Ventura County have expanded to three colleges and one center as demand for higher education increased (Ventura County Community College District, 2017). Murphy (2004) described the mishmash of organizational structure and mission:

> As with the missions ascribed to the state's community colleges, the organizational structure of the California CC system similarly exists in a space somewhere between the K-12 system and the other higher education institutions. And as with many public institutions, its current structure is more a product of historical evolution than any single plan or design. (p. 9)

CCCs Educate Greater Numbers but Receive Fewer Resources

From the standpoint of finances, California CCs receive fewer dollars per student than the K-12, CSU, and UC systems. This means that California CCs educate the greatest number of

students across the three public higher education systems in the state despite having the least amount of funding per student (Dougherty, 1994; Johnson, 2010; Mellow & Heelan, 2014). The lower funding levels within California CCs relative to the other two state systems may contribute to the disappointing student success rates (Murphy, 2004). Indeed, although California has been held up as a model by many states and nations (Cohen & Brawer, 1989; Douglass, 2000; Mellow & Heelan, 2014), many indicators of student success are undeniably low (Aspen Institute, & Achieving the Dream, 2013b). Fewer than half of the students who enter the California CCs receive a degree or certificate, or are qualified to transfer to a 4-year institution within 6 years of starting (CCCCO, 2015b). The success rates of under-represented minority students and remedial education students are even lower, with only 3 out of 10 Black and Latino students transferring within 6 years (CCCCO, 2017d; Martinex-Wenl & Marquez, 2012).

Research Summary

Research on community college student success has typically focused on institutional and student-level factors. For example, several studies have argued that finding and retaining better leaders will lead to improved student success measures (Amey, VanDerLinden, & Brown, 2002; Wyner, 2013). Other research has focused on improving basic skills instruction and student services (Bathgate, Colvin, & Silva, 2011; Legislative Analyst's Office, 2017b; Wyner, 2013). Still other research documents the higher failure rates of underrepresented minorities compared to their white and Asian counterparts and what the California CCs might do to improve equity gaps (CCCCO, 2017d; Tierney, 1999; Venezia & Kirst, 2005). Many of these studies focus their analyses at the student level and do not consider the role that a system's structure may play in the efficiency with which campuses can design and implement solutions that improve student outcomes. This study aims to address this gap by investigating the extent to which the

organization of California CCs into single or multi-college districts is associated with student success measures.

Over the past decade, student completion has been a specific focus, as the state legislature, colleges, and industry grapple with the fact that only 1 in 3 community college students nationwide ultimately obtains a 4-year degree (CCCCO, 2017a). In 2010, several key community college groups entered into a 10-year College Completion Challenge with the goal of increasing by 50% the number of students completing a degree or credential by 50% (American Association of Community Colleges, 2011).

Statement of the Problem

While California CCs have been successful in providing access to higher education for historically underserved populations at a lower cost than any other level of public education, they struggle with student success, retention, and transfer. Prior studies related to student success have typically ignored the role that organizational structure may play in explaining some of the variations in retention and success (Baldwin, Bensimon, Dowd, & Kleiman, 2011; Bathgate et al., 2011; Wyner, 2013).

As the California CCs work to meet the challenges faced by the 21st century student, it remains unclear how the structure of the various college districts affects the success of their students. The 114 community colleges in California, which are housed in 72 districts, vary significantly in structure. For funding purposes, the state categorizes colleges as small, medium, and large (CCCCO, 2015a). Depending on whether colleges are part of a MCD or are in a SCD, the state further categorizes them for funding purposes. Size designation and category (MCD or SCD) determines base funding as shown in Table 1.

Table 1

2015-2016 College Size and Base Allocation Model

Designation	Size	Number of colleges	Base allocation
Small	0-9940 FTES	64	SCD: $3.4 million MCD: $3.4 million
Medium	9940-19,880	40	SCD: $4.5 million MCD: $4 million
Large	19,880	9	SCD: $5.7 million MCD: $4.5 million

Source: CCCCO (2015a)

While some large districts are centralized as SCDs with a single layer of upper management at a district office and various campuses in the community, others are decentralized as MCDs and have multiple layers of upper management at both a district office and at colleges within the district (Cohen & Brawer, 1989). The MCD model allows each campus greater autonomy, by allowing each institution designed as a "college" to determine its own vision. The SCD model coordinates many administrative jobs at a central location and each campus adheres to this central vision. This distinction is evident in the disparate way MCD Los Angeles (with nine colleges, each headed by a president, all overseen by a chancellor) and SCD San Francisco (with multiple campuses, and one president/chancellor) are organized. Little research has been done to evaluate how this variation in operating structure affects student success (Calcagno, Bailey, Jenkins, Kienzl, & Leinbach, 2008; El Fattal, 2014; Jenkins & Rossmeier, 1974).

It is possible, for example, that a centralized organization may put greater distance between administrators and students and faculty, thereby indirectly impacting student success (Birnbaum, 1989). It is also possible, however, that the "double layer" of administration employed by the MCD may result in greater dollar amounts allocated for administration, thus leaving less money available for student instruction. The relationship between student success

and how money is spent is complex and has not been adequately studied in higher education (Pike, Smart, Kuh, & Hayek, 2006). In a literature review of post-secondary student success, Kuh (2008) cited research relating to institution size, student-teacher ratios, and student engagement to student success. It is possible that some of CC organizational models impact student success more positively than others.

How best to organize the various districts was debated several decades ago, with the intention that the debate would be revisited after decisions were made and tested (Atherton, 1986). But once the dust settled regarding district reorganizations in the 1970s and 1980s, little has been written to evaluate whether the CCs' district organization affects student success and per student expenditures. A few studies have examined the decision-making roles of MCDs' district and campus leadership and ways in which leadership is defined at the various levels (Atherton, 1986; Eddy, 2006; Jenkins & Rossmeier, 1974).

The time is thus ripe to examine recent data in an effort to understand whether there is an ideal community college district structure that benefits student success measures. One-third of states nationwide have altered their CC state-level governance structures since 1996, reflecting a trend toward structural introspection in the CCs (Fletcher & Friedel, 2016). Both state-level and district-level governance structures should be examined. State and local policymakers, keen to make data-driven decisions, should carefully examine the various district models to assess how best to allocate scarce resources for California higher education.

Purpose of Study

The CCC system organized itself somewhat haphazardly as it rapidly expanded. As policymakers and the public increasingly seek institutional accountability for student success, a growing body of research has examined the efficacy of various student-focused and institutional

interventions (Baldwin et al., 2011; Calcagno et al., 2008; CCCCO, 2017d; Kuh, 2008). However, previous research has neglected to consider how or whether the varied district structures of the state's CC system relate to differences in student success measures. Thus, this study takes stock of the existing ways in which CCCs have organized themselves across the state and considers how variation in the number of layers of coordination, oversight, and administration across districts relates to measures of student success in the California CC Student Success Scorecard database for the last five cohorts (each one measured over a 6-year period beginning in the 2005-2006 academic year up through the 2010-2011 academic year).

Research Questions

The following research questions guide this study:

1. Controlling for institutional characteristics related to demographics of the student body, urbanicity, and institutional size, to what extent does the structure of the district in which California CCs operate account for variation in institutions' student success measures?

2. Does student success significantly correlate with the proportion of a college's expenditures related to student instruction, the percentage of full-time faculty, or the ratio of faculty to administrators?

Significance of the Study

This study provides insight into whether CC organizational structure impacts various measures of student success and will assist policy makers at the state and local levels to better understand the statistical relationship between organizational decisions and student success rates.

Theoretical Perspectives

Concepts from organizational theory and college impact literature can be applied to evaluate how and why organizational structures within higher education systems may be

associated with student success. This study relies on Mintzberg's (1979) typology of organizational structures, which classifies various organizational structures by degree of complexity. Each classification takes into account the efficiencies and difficulties associated with an organization's degree of structural complexity. This framework is useful as this study seeks to find how the structural organization of the MCD or SCD impacts student success.

Of Mintzberg's (1979) five general types of organizational structures, the two most relevant to this study are the "machine bureaucracy" and the "divisionalized form." Machine bureaucracies place authority at the top of the organizational hierarchy, but allow day-to-day operational decisions to be made by managers within departmental units. In the context of community colleges, a SCD could be considered a machine bureaucracy. MCDs, on the other hand, fit Mintzberg's divisionalized form, in which an organization contains many quasi-autonomous units. For an MCD, each quasi-autonomous unit represents an individual college within a larger, multi-college district. This study considers Mintzberg's identification of the risks and benefits of each of these organizational structures, in an effort to identify the ideal CC organizational structure.

Methodological Approach

This study examined secondary data collected from all of California's CCs and their corresponding districts. The time period under consideration spans the last five cohorts in the California CC Student Success Scorecard database (each one measured over a 6-year period beginning in the 2005-2006 academic year up through the 2010-2011 academic year). Using descriptive and inferential statistics, including means comparison tests and multiple linear regression, the study analyzed data from the CCC Chancellor's Office DataMart, the U.S. Department of Education's College Scorecard (IPEDs), and college and district websites.

Controlling for a standard set of institutional controls (e.g., demographics of the student body, urbanicity, and institutional size), the study identifies whether district structure and administrative expenditures have a practical and statistically significant association with measures of student success.

Research Method

This study turns principally on a consideration of two variables: district structure and the proportion of college expenses allocated to instruction. District structure is measured by a binary variable representing either a single-college district or a multi-college district. Using data from state and federal databases, the proportion of total expenditures that an institution allocates to instruction is calculated. Also considered are potentially confounding variables related to institutional structure and demographics. For example, the study controls for the size of the college, total college expenditures, student-to-teacher ratio, and college demographics. Consideration of these variables allows for a fair comparison of organizational structures and student success.

The outcome variables in this study are measures of student success from the California Community Colleges Chancellor's Office DataMart and the U.S. Department of Education (2017) website. Student success measures include: (a) persistence, defined as the percent of students who enrolled at a CC for the first three consecutive semesters; (b) completion of at least 30 units, defined as the percent of students who obtain 30 units during a 6-year period; (c) completion overall, which is defined as obtaining a degree, certificate, or transfer readiness during a 6-year period; and (d) remedial math and/or English success, which is defined as completion of transfer-level coursework after being placed in remedial math and/or English.

These definitions and the history of the student success movement are further described in Chapter 3.

Delimitations

The goal of this study was to identify relationships among existing data sets in California CCs. In viewing the data for the various colleges, only institutional data is considerd, as opposed to data associated with individual students. The DataMart provides access only to combined files of student-level data, and thus does not permit the more nuanced and specific analysis that would typically be associated with analyses of student-level data.

Limitations of the Study

This study sought to interpret existing data related to student success and organizational structure in CCCs only. The study was not intended to explain why some of these discovered relationships exist. Further, this study produced no new data, but rather relies on existing data. Thus, existing variables and the definitions of those variables must be accepted as they are, and this study cannot control for misreported or missing data. Furthermore, if the state and federal agencies have not seen fit to collect certain data, then that information is missing. For example, information about success tied to specific teachers would potentially be of interest in an evaluation of student success at various colleges. But as these data have not been collected, we did not consider this variable in this study.

Another limitation of this study is the use of aggregated data. Aggregation at an institutional level masks important nuances within institutions across various student demographic groups. Disaggregated data on individual students within colleges is not readily available or within the scope of this study. It is my hope that policymakers will use this study and its findings to make policy decisions that benefit and further student success in CCs.

Summary

In an effort to improve educational outcomes at every level of the community college, this study attempted to discover if structural decisions impact student success. To do this, we review how structural decisions in the past have played out over the last few decades. While a MCD or a SCD might appear to be "just how things work," much discussion and imagination went into designing the system currently known as the California Community College. This study hopes to use available data to untangle the complex system and to describe how the various types of institutional structures can impact student success rates.

Chapter Two: Literature Review

Introduction

Much has been written about ways to improve community college student success with an emphasis on institutional practices and personal habits (Bathgate et al., 2011; Duckworth & Quinn, 2009; Kuh, 2008; Lightweis, 2013; McCabe, 2003). What has not been widely looked at, however, is the extent to which the organizational structures of CCs have affected student success. Such an evaluation is warranted, given that that fewer than half of CCC students complete a degree, certificate, and/or transfer within 6 years of when they begin (CCCCO, 2017c; Aspen Institute, & American Association of Community Colleges, 2013a); Lightweis, 2013; McCabe, 2003). For the 75% of California students who enter community college unprepared for transfer-level work in either English or math (or both), the completion of a degree, certificate, and/or transfer drops to 39.6% (CCCCO, 2017c). In addition to low completion rates for community college students, California, as a state, lags most other states in B.A. attainment (Geiser & Atkinson, 2013).

Over the course of the last century, the explosive growth of the community college has resulted in colleges organizing and structuring their institutions in various ways within states and across the country (Beach, 2012; Cohen & Brawer, 2003). States have structured their expansion of higher education in assorted ways--from making community colleges part of the state university system, as Indiana has done, to making community colleges one part of a tripartite system of higher education, as was done in California (Beach, 2012; Brossman & Roberts, 1973; Center for Community College Policy Education Commission of the States, 2000; Diener, 1986; Fletcher & Friedel, 2016). A third of states have changed their CC state-level governance structures since 1996 in an attempt to streamline and make sense of their K-20 educational

systems (Fletcher & Friedel, 2016). For example, California created the Master Plan of 1960 that effectively tracked more than half of all students enrolling in public higher education in the state to begin at the community college level (Douglass, 2000; Johnson, 2010). But how the community colleges developed--whether they became multi-campus districts or single campus districts and how they structured their administrations--varied greatly. This study attempts to find and examine direct and indirect relationships between the way a California community college district is structured, on the one hand, and its effectiveness, as quantified by student success measures, on the other. (See Figure 1.)

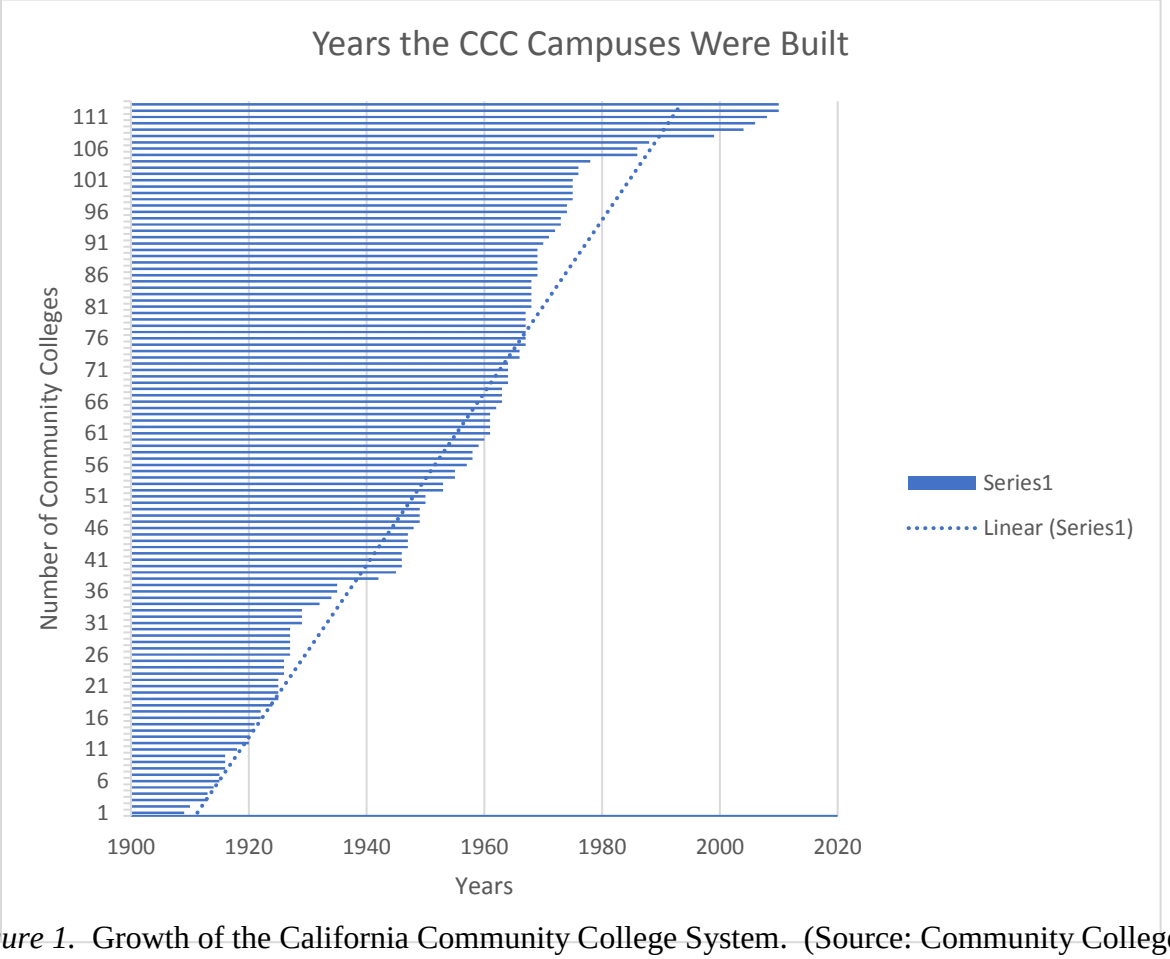

Figure 1. Growth of the California Community College System. (Source: Community College League of California, 2017)

Roadmap for the Literature Review

This literature review will consider two indicators of institutional organization--type of district (multi-college or single college) and the percent of a district's budget spent on instruction. While some research has been done on how these organizational factors impact student success measures (El Fattal, 2014; Karamian, 2011; Murphy, 2004), these studies have not adequately examined relevant quantitative data to fully understand how organizational structures relate to student success outcomes. This review first examines research on two parts of community college organization--district type and district allocation of funds. Next, I review how student success is measured and its relationship to institutional organization. Finally, I analyze how the framework offered by Mintzberg (1979) provides perspective as to why organizational structures within community college districts may have a relationship to measures of student success.

Organizational Structure

Traditionally, K-12 and higher education have differed in the way they structure their organizations to meet the needs of students, employees, and the communities they serve. The community colleges in California are unique among public institutions in that they share common structures with both the K-12 system and the CSU and UC systems (Cohen & Brawer, 2003; Diener, 1986; Geiser & Atkinson, 2013). Among the 114 CC campuses divided into 72 districts, internal organizational configurations of faculty, administrators, and staff vary as well.

Weak CC Organizational Structure and Faculty Unions

Community colleges struggle for "legitimacy and status" in the higher education arena (Vittetoe, 2001) in part because many began as extensions of high schools, and their "organizational forms resembled the lower schools more than they did the universities" (Cohen

& Brawer, 1989, p. 92). Several researchers have traced the changing management style at the CCs as they grew up over the last century. Sullivan (2001) identified four distinct generations of presidents who have led American community colleges: "the founding fathers, the good managers, the collaborators, and the millennium generation" (p. 559). These categories trace the leadership roles of those who broke new ground by founding the first community colleges in the early 20th century, to the "manager" presidents who helped double the number of community colleges in the 1960s in response to the GI Bill and increased number of baby boomers attending college. Mirroring national trends, California established 350 new community colleges between 1965 and 1970--more than twice as many as have been established since 1970 (Cohen & Brawer, 1989). Later came the "collaborator" presidents, who worked with businesses, local, state, and federal governments as well as their communities, to piece together resources during recessions and funding crises of the 1980s and 1990s.

The current presidents, Sullivan's so-called "millennials," must weave together an increasingly multifaceted mission that includes workforce development, basic skills remediation, transfer readiness, vocational programing, and community education. In the midst of these concerns, community colleges must also compete for students with for-profit schools and increasingly produce data-informed evidence of their students' success.

Some research connects weak governance structure in community colleges with the rise of faculty dissatisfaction, which resulted in faculty unionization (Castro, 2000). Wiley (1993) maintains that unionization in higher education was seen as a "community college phenomenon" that resulted from the implementation of industrial-style management in the face of declining enrollments, recession, and cuts in education funding during the 1960s and 1970s (Castro, 2000).

Researchers found that faculty unions at colleges with ineffective governance became more beleaguered and less collegial (Drummond, 1995), likely putting more pressure on those in charge. And by the mid-1990s, community college faculties were "the most unionized of all in post-secondary education" (Cohen & Brawer, 1989, p. 132). As faculties gained a greater voice in community college governance, the power exercised by CC presidents became more constrained, resulting in more bureaucracy and layers of management (Cohen & Brawer, 1989). Faculty unionization does not prove that institutional governance was weak at all CCs. However, it does suggest that this newest form of higher education experienced growing pains in the years immediately following its vast expansion at least in part due to its ad-hoc nature of development (Cohen & Brawer, 1989).

Eyeing Efficiency, Some Leaders See Multi-Unit Institutions as a Solution

During the budget fallout of the Great Recession, an online news source stated that community colleges "spend millions on duplicative administrators" while cutting class sections and services for students (Perez & Armendariz, 2013). Riverside Community College District Chancellor Gregory Gray is quoted claiming that millions could be saved if colleges consolidate into multi-college districts (Perez & Armendariz, 2013). In doing so, Chancellor Gray repeated the common (but not necessarily verifiable) trope that a multi-college district can cut costs by merging administrative offices (e.g., human resources, instructional technology, fiscal services), and eliminate costs associated with more than one board of trustees. However, this argument in support of the MCD structure oversimplifies the MCD's complex funding and assumes that economic efficiency is the primary goal without regard to the effect that a larger district may have on students, faculty, deans, and other stakeholders, as the central hub of organizational power transfers from a single college campus to district offices.

In previous decades, especially in the 1960s-1980s, similar arguments were made to support the initial creation of multi-college districts. While the efficiency of centralizing certain functions might seem self-evident, the reality has proved to be more complicated. When a SCD district becomes a MCD, a costly new district site with its attendant employees must often be established. The duplication of efforts must be considered and the chain of command clarified (Jones, 1968). MCD structures necessitate a greater distance between the district chancellor and the students attending the various colleges in the district. Faculty, also, are no longer close to the center of decision-making power, which can lessen the faculty voice in decisions.

As far back as the late 1960s, there was interest in studying the various organizational structures and agreement that the expansion of the community college system in the United States happened in an ad-hoc haphazard manner (Beach, 2012; Center for Community College Policy Education Commission of the States, 2000; Henry & Creswell, 1983; Jones, 1968). In his seminal report funded by the American Council on Education, "The Development of American Multi-Unit Junior Colleges," Jones (1968) forcefully argued:

> the tragedy is […] that no body of theory or concept of organization has evolved to make these new directions understandable or acceptable. In short, multi-unit operations have evolved in many directions with each institution moving uniquely in its own situation, toward its own goals, and influenced by its own history. In many cases this movement has been under the pressure of necessity, the absence of time, the press of huge student populations clamoring at the open door. Little or no effort has been made to study these multi-unit developments, to determine efficiency, to discard ineffective practices and outmoded organizations. In fact, only a few efforts, such as Jensen's 1964 study, have been reported which attempted to classify or categorize existing patterns. Furthermore,

few articles have appeared in The Junior College Journal explaining and reporting trends for this exciting phenomenon. (p. 2)

Large MCDs exist all over the country, especially in urban areas. This study sought to understand the extent to which district structure is associated with student success. This question is especially important given the growing tendency to think of higher education as a "numbers" game--that is, how can colleges and universities most efficiently admit, enroll, and graduate the largest number of students for the least amount of money. However, if great numbers of students fail to succeed, as is reflected by rates currently found within the California CC system, the cheapest approach may not necessarily be the most efficient or desirable.

Themes in District Organization

During the time of immense growth in community colleges, several themes in organization emerged. Policymakers have debated for decades whether centralized or decentralized authority represents the better approach (Jenkins & Rossmeier, 1974). Concerns about the extent to which centralization of authority affects institutional autonomy at the campus level, the effect of ambiguously defined roles, and the degree of personalization experienced by faculty and students have persisted (Kintzer, Jensen, & Hanson, 1969).

As they expanded, districts began to adopt varying organizational structures that changed the relationship between administrators, who made decisions, and the faculty, staff, and students, who were affected by those decisions. These organizational shifts resulted in varying degrees of autonomy for campuses and/or colleges. A SCD with one campus could choose to retain its current status even after adding additional campuses to establish a single-college multi-campus district (SCMCD). At SCMCDs, each campus that is part of the larger college has only minimal local autonomy. Alternately, a SCD could join another nearby SCD and expand to a MCD. At

MCDs, each college maintains much local autonomy, although the college presidents report to a central district chancellor, who is hired by a board of trustees to lead the collective district (Atherton, 1986, CCCCO, 2016). As stipulated by Standards IV.D.1 and IV.D.2, established by the Accrediting Commission for Community and Junior Colleges (ACCJC), each MCD must create a functional map, usually contained in the participatory governance handbook for each district, that defines the roles of the colleges and district in the decision-making process (ACCJC, 2017). The college president has authority to make decisions regarding curriculum, budgeting, hiring, and course offerings and cancellations. The district is generally responsible for providing human resources, fiscal services, and an information technology (IT) department. The district and college are interdependent, but ultimately the chancellor sets the district's vision, rather than presidents of the district's colleges (Atherton, 1986).

CC leaders and policymakers debated the pros and cons of these different structures in the late 1960s. But community colleges were growing so rapidly that they lacked sufficient time to study the various models in depth or to proceed with care (Jones, 1968; Kintzer et al., 1969). Furthermore, most researchers acknowledge that there was no model for this rapid growth in higher education, and, as a result, CC structures differed greatly from district to district and state to state, as each community attempted to cope with expansion (Jenkins & Rossmeier, 1974; Jones, 1968; Kintzer et al., 1969). As Jones warned in 1968, "the multi-unit system can bring either economy and efficiency or chaos and confusion" (p. 1). He explained that multi-unit systems can potentially streamline processes and conserve resources spent on administration, thereby allowing for greater effectiveness. But if additional layers of bureaucracy are not well structured, there is a risk that administrative bloat and complicated reporting lines will slow

decision-making and result in confusion as to who has authority. Jones further argued that larger organizations might end up struggling with red tape and lack of communication:

> There is a tendency, as multi-unit systems grow in size, for supportive services to grow into bureaucracies. Organization for administration is a perplexing question, not only for the multi-unit organization, but for the whole junior college movement. (Jones, 1968, p. 45)

In a similar vein, Cohen and Brawer (2003) trace how decision-making and power tend to aggregate in the central office in an MCD regardless of original intentions:

> Ideally, participation in decision-making would be shared at all levels from the central office to the various campus departments, but power tends to gravitate toward the central district administration. As an example, in nearly all multi-unit districts, budget requests may be generated on each campus, but only within the guidelines and limitations set down by the central authority. The central district offices often also maintain separate legal affairs offices to ensure that all decisions on personnel selection and assignments are made in accordance with the terms of the contracts and laws governing the institution. (p. 111).

Beginning in the 1960s, in an attempt to manage burgeoning enrollment, many districts expanded from one college campus to either multi-campus or multi-college structures. Of course, some CCs did not grow and stayed small, and others coped with growth through additional building on their original site. However, in urban areas with intense demand for college access, new colleges or new existing college sites expanded. By the late 1960s, a trend toward multi-college districts had emerged (Kintzer et al., 1969).

Variation in Organizational Structure Among California's 72 CC Districts

California CCs confronted these organizational challenges during the years of rapid expansion from the 1950s through the 1980s. In its current 72 districts that house 114 colleges, several models of organization emerged.

Large MCD

The multi-college Los Angeles Community College District is the largest community college district in the United States. It comprises nine colleges, each of which is governed by its own president (see Figure 2). A chancellor, overseen by an elected board of trustees, governs the district (LACCD, 2017).

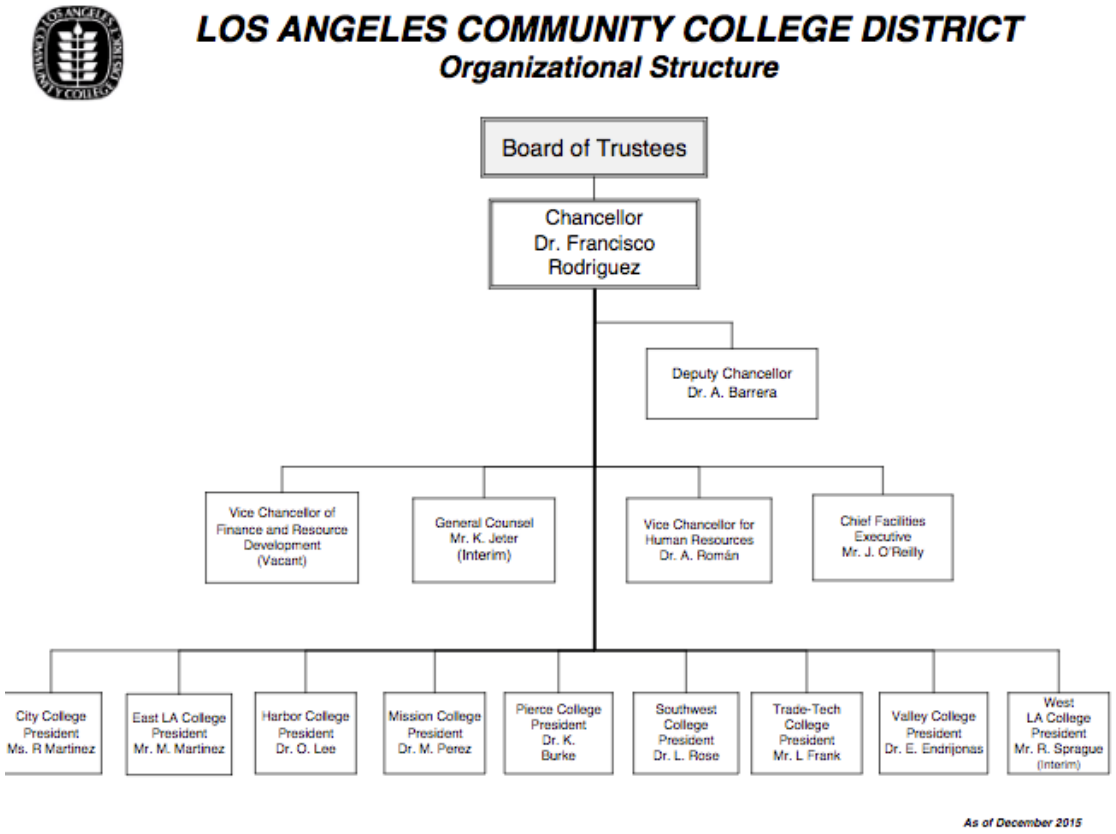

Figure 2. The organizational structure of the Los Angeles Community College District. (Source: LACCD, 2017)

Medium or Small MCD

Smaller multi-college districts generally house two to three colleges within each district (see Figure 3). An example of this structure is the medium-sized Ventura County Community College District, in which a chancellor heads the district office, and each college has a president, vice-presidents, and deans.

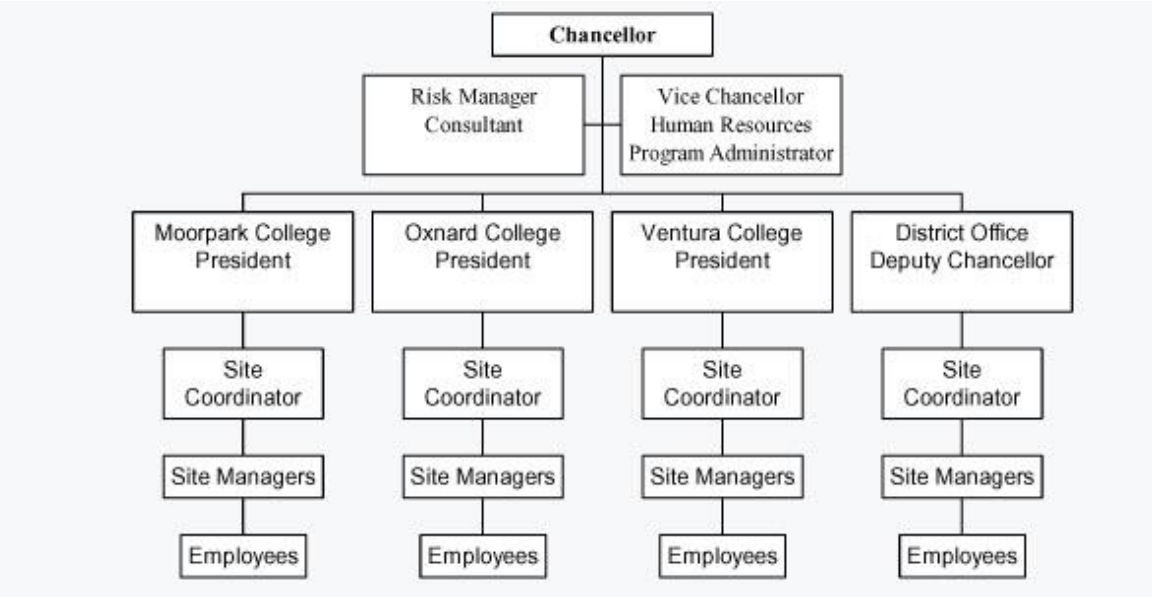

Figure 3. The organizational structure of the Ventura County Community College District. (Source: Ventura County Community College District, 2017)

Large Single-College Multi-Campus District

In contrast to the multi-college district structures of LACCD and Ventura College, the City College of San Francisco has established a single-college, multi-campus district, as shown in Figure 4 and Figure 5. CCSF has a centralized chancellor's office and deans (not presidents) overseeing each site. Although various campuses specialize, CCSF's model gives less autonomy to each campus and consolidates administrative power in the central office (City College of San Francisco, 2017).

California also has many smaller single-college multi-campus districts. For example, Cuesta College, which is in the SCD of San Luis Obispo County Community College District, has three campuses. The secondary campuses are overseen by a dean, who reports to the vice president of academic affairs. Figure 6 shows the organizational chart for Cuesta College in the SLOCC district.

Small or Medium SCD

Finally, the simplest organizational structure within the California CC system is a single-college single-campus district. The Santa Barbara Community College District has just one college, Santa Barbara City College (Figure 7). SBCC has a single campus that serves around 17,000 full-time equivalent students (FTES) and is structured in the way in which the university has typically been conceived--one campus, one college, one district.

These following organizational charts highlight the variation in how California CCs organized themselves during the explosive growth of community colleges in the state throughout the 1960s and 1970s. Unfortunately, after these new various structures were established, examining their effectiveness lost much of its urgency. Wattenbarger (1977) pointed to a scarcity of research on decision-making in multi-unit districts. One exception is Atherton's (1986) unpublished dissertation, which examined decision-making practices between presidents and chancellors in the multi-college districts of California. She characterized her research as providing foundational information on the relationships between the layers of administration at MCDs. She pointed out that, although MCDs are now common, this new organizational system of higher education is without precedent, and notes that the lack of clean lines demarcating the various roles within campus and district administration. Atherton (1986) found that, in most

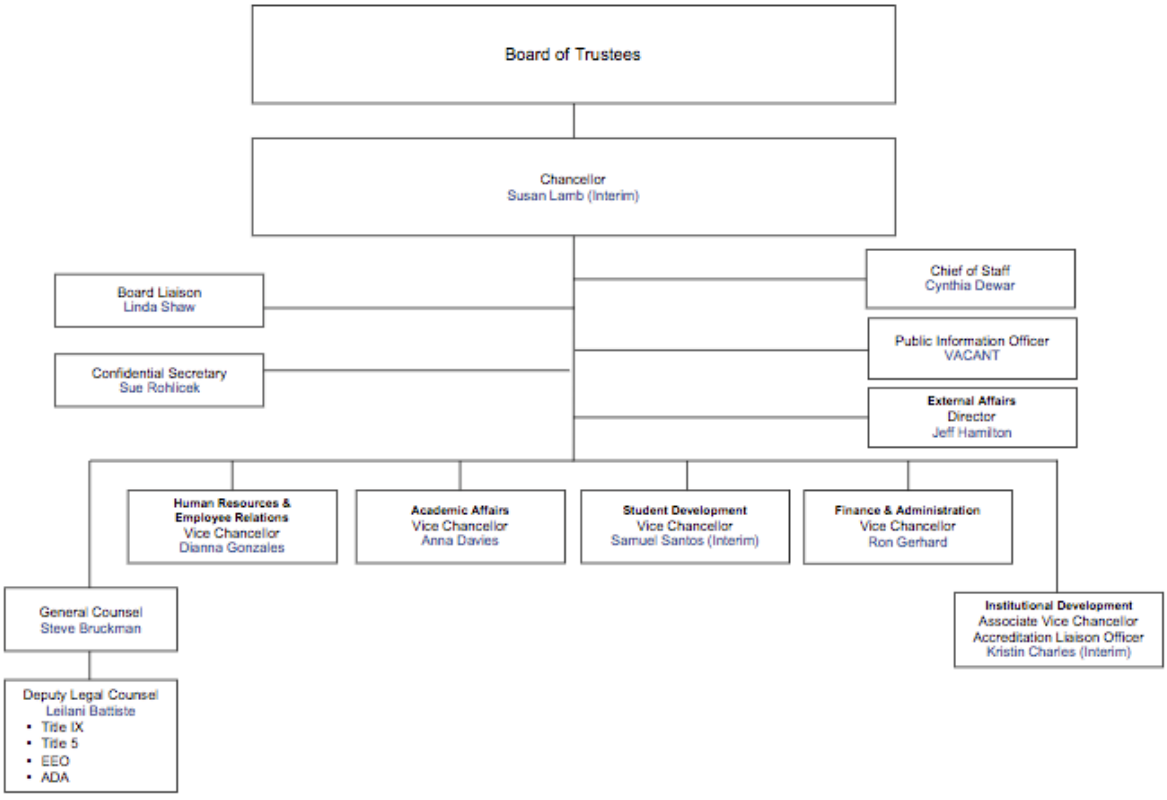

Figure 4. The organizational structure for City College of San Francisco. (Source: City College of San Francisco, 2016b)

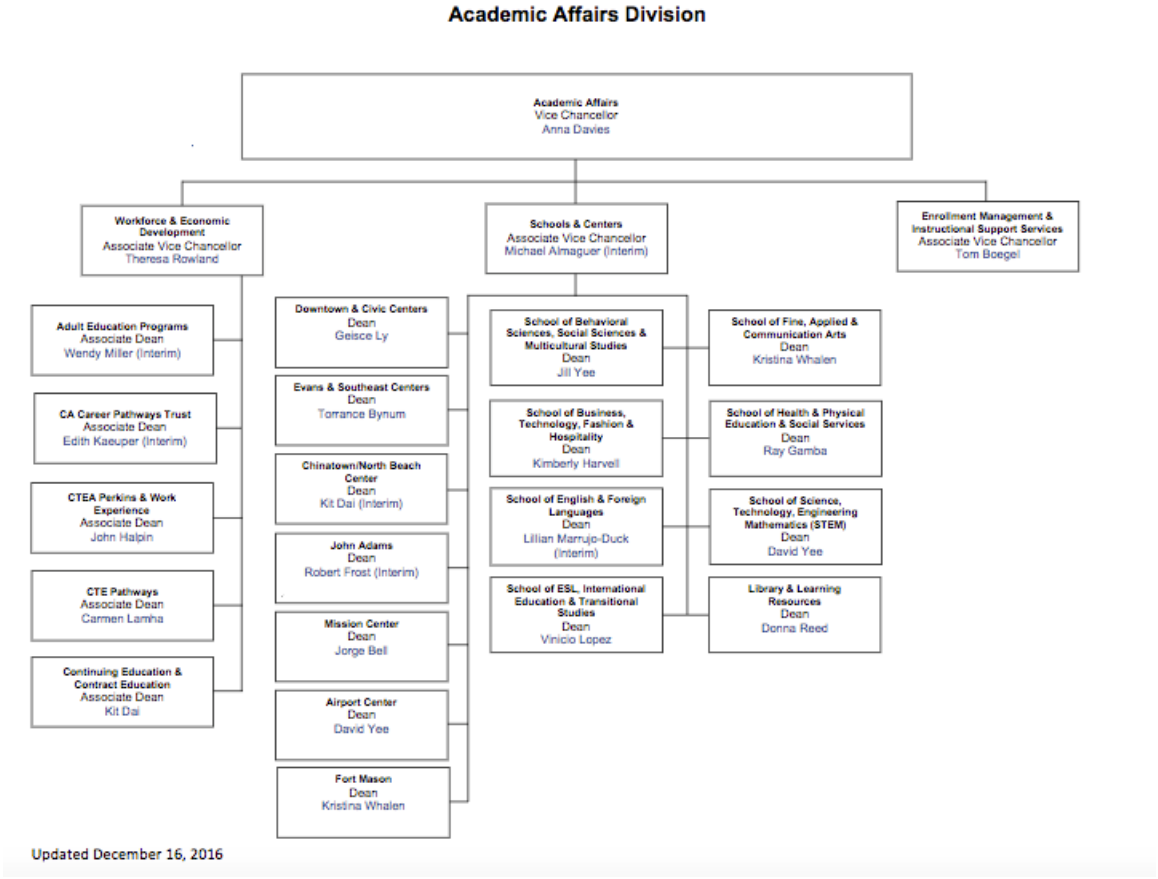

Figure 5. The organizational structure of individual campuses within City College of San Francisco. (Source: City College San Francisco, 2016a)

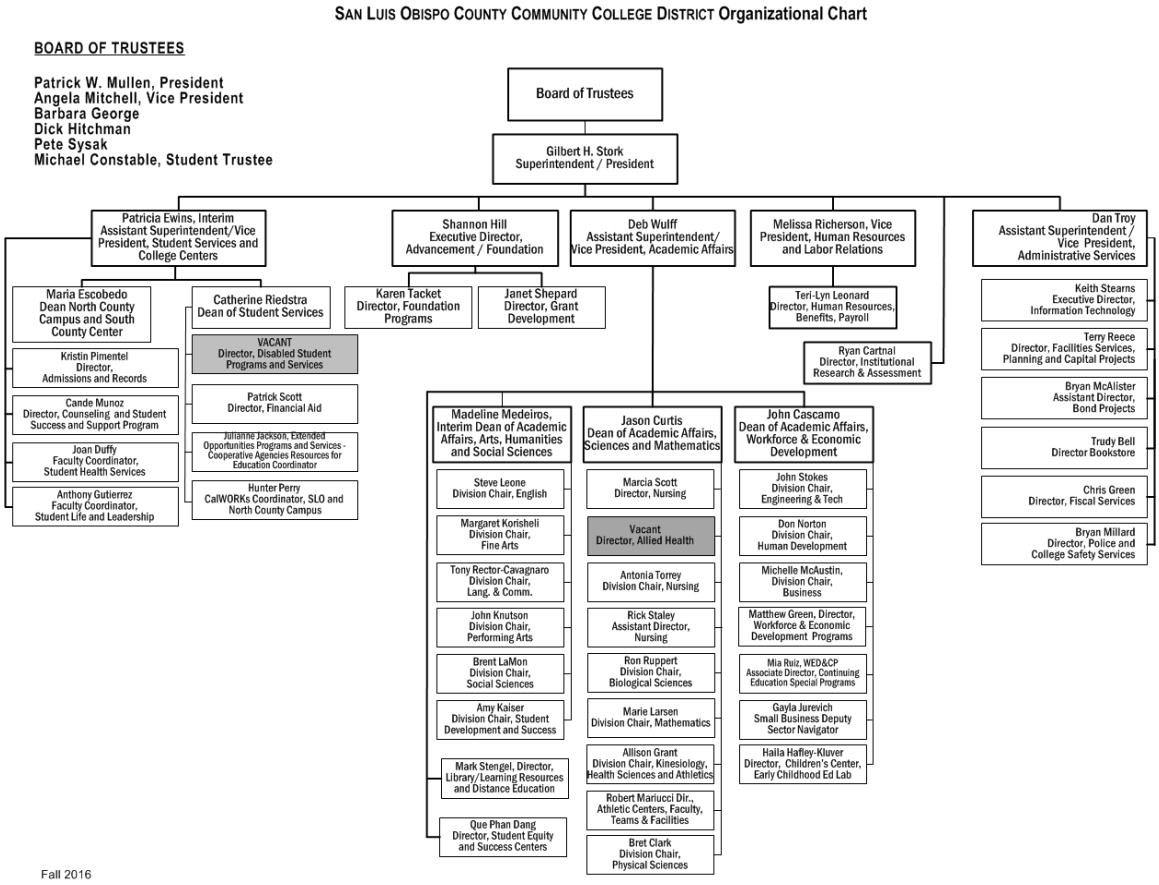

Figure 6. The organizational structure of San Luis Obispo Community College District. (Source: Cuesta College, 2017)

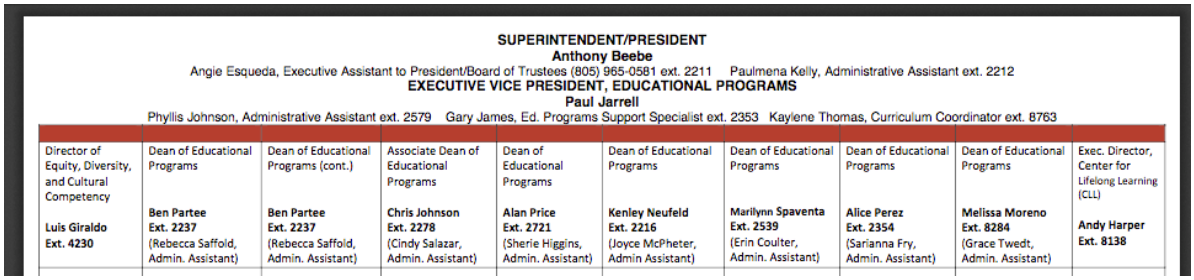

Figure 7. The organizational chart for Santa Barbara Community College. (Source: Santa Barbara City College, 2017)

MCDs, while presidents and chancellors generally agreed on their respective job duties, how presidents interacted at a district level was unclear. She recommended formalizing the responsibilities of presidents at the district level.

By the mid-1980s, the MCD structure was well established in California's system of higher education. California CCs had made at times haphazard choices regarding district structure, and some institutions subsequently worked from within to clarify the relationship between a district and its colleges (Atherton, 1986). But as Murphy (2004) pointed out, the "current structure is more a product of historical evolution than any single plan or design" (p. 9). Given this unplanned evolution in the way in which institutions organized themselves, a systematic examination of the extent to which California CCs' district structures are associated with student success measures is warranted.

Funding Structure for California CCs

The way in which the California CCs are funded is complex and historically interesting. Murphy (2004), in his seminal text *Financing California's Community Colleges*, described the dramatic shifts in funding during the previous 40 years and the "push-pull" that has existed between district and state authorities. Before 1978 and the passage of Proposition 13, community colleges were funded primarily by local tax revenues with some state and federal

funding and control. Proposition 13 severely limited property tax revenues, forcing the California CCs to revamp their funding structures. After 1978, California CCs sent their revenues to the state, which then apportioned the funds back to the colleges using a complex formula that considered college size and the number of FTES (Association of California Community College Administrators, 1994; Center for Community College Policy Education Commission of the States, 2000). In the aftermath of Proposition 13, the California CCs struggled under the mantle of a centralized state authority that, in the face of lower enrollment, mandated budget cuts and layoffs. Cuts that had previously been made by the CCs locally were now dictated by state authorities (Association of California Community College Administrators, 1994; Livingston, 1998).

Whether a centralized state chancellor's office should make individualized budget decisions for a CC was heavily debated in the 1980s after Proposition 13 negatively affected the California CCs' funding. Concerns with this approach ultimately resulted in the enactment of AB 1725, which shifted power from the legislature back to local boards and allowed California CCs to regain greater local autonomy (Association of California Community College Administrators, 1994; Livingston, 1998). AB 1725 pushed back against excessive state control (Association of California Community College Administrators, 1994; Johnson, 2010; Livingston, 1998; Murphy, 2004). Currently, state-level initiatives for basic skills, equity, and student success do not tie funds to college performance. However, a number of legislators are pushing for performance-based funding, which would once again give the state chancellor's office greater authority over local campus funding decisions (Legislative Analyst's Office, 2017b).

Historically, the state apportionment formula was called Program Based Funding; the formula has been criticized as "opaque and needlessly complicated" (Murphy, 2004, p. viii).

Murphy (2004) further explained that, in 2000-2001, the state had funded only 54% of the amount the formula estimated was necessary for districts to meet benchmarks. Since the publication of his book in 2004, funding has evolved still further with the introduction of Proposition 98, which has increased funding for California CCs and given them a more equitable share of the budget for higher education (Legislative Analyst's Office, 2017b; Mellow & Heelan, 2014). Pursuant to Proposition 98, most CC districts are allocated funds primarily based on FTES. A few property-tax rich districts elect to keep their local property tax revenue when it is greater than state FTES apportionment funding would be (CCCCO, 2012). Some funds are general awards with few restrictions, while other funds are specifically designated for spending on specific initiatives. Districts retain autonomy to determine their organizational structure, and they have greater leeway with respect to how they allocate their general funds to various units including administration, instruction and student support services, among other areas.

A review of the online budgets of various CCs reveals significant differences in presentation, although all comply with the accounting requirements for public institutions and state regulations (City College of San Francisco, 2016b; Cuesta College, 2017; LACCD, 2017; Ventura County Community College District, 2017). The variation in formats and presentations of budgets contributes to difficulties in comparing budgets across California CCs with respect to administrative expenses, instructional expenses, and total budgets.

Organizational Structure, Budgets, and Student Success

The extent to which there is a connection between institutional organization and student success at the community college level has not been deeply investigated. In his dissertation research, El Fattal (2014) attempts to trace the connections between CC type, expenditures, and student success. He asks how MCD and SCD structure affect student success but does not

systematically address this research question in his findings. Another study, especially relevant to this research, examined the institutional characteristics that impact student success for community college students who attended more than one community college. These investigators found "a negative relationship between relatively large institutional size, proportion of part-time faculty and minority students on the attainment of community college students" (Calcagno et al., 2008, p. 1).

Student success measured within the institutional context of 4-year colleges and universities has shown a correlation between college selectivity and persistence. That is, if a student is surrounded by fellow students with higher academic skills, the student more successful than would have otherwise been expected based on his or her academic abilities (Titus, 2004). Calcagno et al. (2008) found, for CC students, that the higher the academic success among the student body, the greater chance of success a student had at that institution. However, since CCs are generally attended by the students in the local community and admit virtually all applicants, they are not able to attempt to boost student performance through institutional strategies of selectivity.

Measuring Community College Student Success

In a report for the National Symposium on Postsecondary Student Success, Kuh, Kinzie, , Schuh, and Whitt (2005) discussed the varying ways student success has been defined. They pointed out that success for the community college student is not solely degree attainment. Non-traditional students attend school for personal development or to develop workplace skills. Commuter students and part-time students typically are not on the same timeline as their peers attending traditional 4-year colleges, suggesting that benchmarks of student success should be sufficiently flexible to account for different educational pathways, enrollment intensities, and

strengths of preparation among students. Definitions of student success have ranged from course completion to the degree of satisfaction students have with their experience to credential completion. Thus, Kuh et al. (2005) defined student success broadly "as academic achievement, engagement in educationally purposeful activities, satisfaction, acquisition of desired knowledge, skills and competencies, persistence, attainment of educational objectives, and post college performance" (p. 7).

This section first puts in context the issues related to student success at California CCs and then describes how the state of California defines and measures success.

Community College Student Success in Context

A full understanding of student success in California CCs begins with a consideration of the California Master Plan. Hailed as a model for many other states, the Master Plan of 1960 set out to make higher education available and affordable for all California residents. The Master Plan has remained largely intact since its inception more than 55 years ago, and its changes have principally concerned budget matters and student fees (Douglass, 2000; Geiser & Atkinson, 2013; Johnson, 2010). The Plan established a tiered structure for California higher education. The UC system accepts the most academically prepared students, confers undergraduate and graduate degrees, and performs academic research. The CSU system accepts the next group of academically prepared students and confers undergraduate degrees (as well as some master's degrees, and recently a limited number of professional doctorates). Finally, the open-access community college system admits students regardless of preparation, confers associate degrees and certificates, and trains students in career and technical education (CTE). A notable recent change to the Plan recently is that 15 California CCs are piloting baccalaureate degrees in high

need areas like dental hygiene, mortuary science, and Health Information Management (CCCCO, 2015b).

The differences in missions and student characteristics of the three systems of higher education mean that student success must be defined and measured differently for each of these three entities.

California CC Student Success Measures Compared to the CSUs and UCs

As noted in Chapter 1, 75% of students entering the California CCs, 40% of incoming CSU students, and 23% matriculating freshmen at the UCs begin their undergraduate careers unprepared for college-level work in either math or English (UCs tests writing proficiency only if students have not met entry-level writing requirements; Legislative Analyst's Office, 2017a). Given the variation in students' pre-college preparation, each system defines student success somewhat differently, although they all generally focus on measures of student retention, credential completion, and goal attainment. Such metrics might include, for example, first-year retention rates, 3-year associate's degree completion rates (150% of "normal" time), successful transfer from a 2-year to a 4-year institution, and 6-year bachelor's degree completion rates.

This study attempts to provide some insight into potential reasons for the problem of low success rates in the California CCs. But California CCs face additional problems. As a result of inexpensive tuition and the broad access mission of California CCs, the system currently serves more than half of all students enrolled in public higher education institutions in the state. As shown in Figure 8, enrollment has grown at a substantially faster rate within the California CC system compared to either the CSU or UC systems. Additionally, the data suggest controlled growth within the UC and CSU systems, which select students for admission from a larger

applicant pool. By contrast, enrollment within the California CC system appears to be more sensitive to changes in policy and the economy.

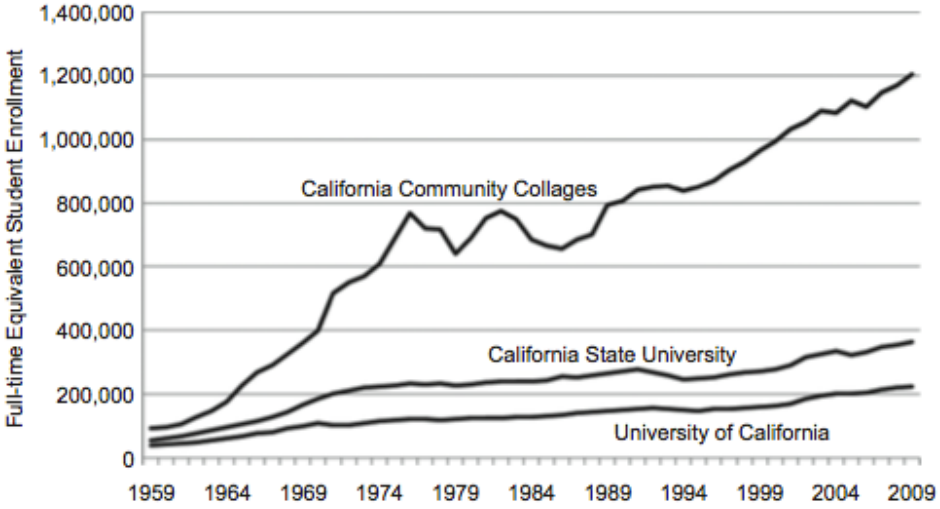

Figure 2: Growth of California Public Higher Education Enrollments since the Inception of the Master Plan.
Source: California Higher Education Policy Center (1997), California Postsecondary Education Commission (2009).

Figure 8. Enrollment Growth across California's Public Higher Education Systems. (Source: Geiser & Atkinson, 2013)

The Community College "Penalty" and Its Impact on B.A. Attainment

With so much of the growth in enrollment within public higher education institutions in California being absorbed by the community college system, the California Master Plan may have the unintended consequence of undermining baccalaureate degree attainment rates among the state's college-aged population. Geiser and Atkinson (2013) ranked California 43rd among states based upon the proportion of college-age individuals with a bachelor's degree. California's poor performance is even starker when the data is disaggregated by race and/or ethnicity. The report also showed that California ranks second among states in the proportion of college-age individuals enrolled in public higher education. However, the authors note that only

25% of students enrolled in public higher education in California attend a 4-year institution, which puts the state near the bottom of the list in 4-year institution attendance rates among college-age individuals.

Geiser and Atkinson (2013) suggested that California 4-year universities and colleges do not have the capacity to meet the demand for postsecondary education in the state. They also point out that there may be a "penalty" imposed on students who begin their studies at a 2-year institution. Controlling for student characteristics, analyses of 9 years of data from the state of Ohio shows that there is at least a 14.5% "penalty" in BA attainment associated with students who initially attend community colleges (with plans to transfer) versus those who initially attend 4-year colleges (National Bureau of Economic Research, 2009). Given that more than half of all students enrolling in public higher education in California begin, extend, or augment their undergraduate careers at a community college, further investigation into factors that both facilitate and hinder the success of students enrolled at California CCs is warranted. Furthermore, given the unsystematic ways in which California CCs organized themselves as the system rapidly expanded during the 1960s and 1970s, a specific focus on the extent to which current district structures and resource allocations correlate with measures of California CC student success addresses a critical gap in the research.

These data discussed above underscores the implications that organizational structures and state policies potentially have for college enrollment and degree completion rates. An unintended consequence of the California higher education systems' structure may be that students who begin college at the community-college level are "penalized" relative to their academic equals who begin at 4-year institutions. This example of how structural decisions at the state level may affect student success outcomes provides further justification for an

examination of both California CC administrative structures and the California's structure of higher education as a whole.

Students' successful matriculation into and through California CCs becomes even more critical when state economic factors are considered. The Public Policy Institute of California (PPIC) estimates that, by the year 2025, California will be short one million B.A.s (Johnson 2010), while the CCCCO sets this number at 1.1 million (CCCCO, 2017c). Thus, structuring California CCs within the larger system in ways that begin to optimize student success may not only improve outcomes for the individual students but may also contribute to ensuring a stronger economic future for the state.

Tracking Student Success Within the California CC System

California's CC system has one of the more robust, comprehensive data systems among state higher education systems. In fact, the state maintains a unit-record system that tracks enrollment pathways, course histories, and demographic characteristics of the system's more than 1.5 million students who enroll each year. Because of confidentiality concerns, access to this unit-record system is severely restricted. On its DataMart website, the CCCCO publishes yearly data aggregated by each community college, and these institution-level data can be disaggregated by college, gender, ethnicity, age, and college preparedness (CCCCO, 2017d). Two data systems provide the general public with access to the data aggregated at the institutional and system levels. The state's Student Success Scorecard follows students in a 6-year cohort model, in which the system categorizes students as "prepared" for college or "not prepared" for college. The designation of "unprepared," which applies to 75% of all incoming California CC students, means that a student has been placed into at least one below-college

level class. For clarification, a college-level class is one that will transfer to a 4-year as college credit (CCCCO, 2017d).

In addition to the Student Success Scorecard, the CCCCO also supplies statistics via its DataMart website (CCCCO, 2017c). This searchable database offers statistics on education and is meant to be used by the general public, as well as by researchers. Both of these websites further institutional transparency and accountability, as users are able to compare a number of measures of student success by college, including retention rate, demographics, attainment of 30 units, completion of a degree or certificate, and persistence (CCCCO, 2017c; 2017d). In Chapter 3, a chart shows the precise way the state defines each of these success measures.

Theoretical Perspectives

Mintzberg (1979) provideed a theoretical and conceptual underpinning for this study. He offered a typology of organizational structures and describes how each classification might experience efficiencies and difficulties associated with the degree of structural complexity. This framework is relevant as this study investigates how the structural organization of the MCD or SCD impacts student success. This section considers how Mintzberg's classifications will be applied in this study.

Mintzberg (1979) proposed five general types of organizational structures: simple structure, machine bureaucracy, professional bureaucracy, divisionalized form, and adhocracy. The two types of structures most relevant to the current study include the machine bureaucracy and the divisionalized form. Mintzberg posited that, for machine bureaucracies, the most significant decisions are made at the top of the organizational hierarchy, but day-to-day operational decisions may be made by managers within departmental units. In the case of the community college, a single-college district is an example of machine bureaucracy. The

president of the college, who also leads the district, and those reporting directly to the president make decisions about institutional strategy and direction, while other operational decisions are delegated to academic departments and other administrative units. This structure allows for experimentation and innovation within the smaller units, and these units also have the flexibility to more readily meet the needs of their employees and clients (e.g., staff, faculty, and students). This kind of structure, which is also typical of a small 4-year college, potentially allows the college to be more responsive to market demands given the delegation of authority in decision-making.

Multi-college districts, by contrast, best fit Mintzberg's divisionalized form, which he describes as an organization with many quasi-autonomous units. Each quasi-autonomous unit represents an individual college within a larger, multi-college district. Mintzberg (1979) argued that such an organization may find economies of scale given that some administrative processes can be centralized within the larger organization, and minimizes the need for semi-autonomous unit to develop and staff such systems. In the case of multi-college districts, for example, human resources can be centralized at the district level so that each individual college does not need to staff and fund its own human resources department. At the same time, Mintzberg suggested that the divisionalized form can become dysfunctional if a quasi-autonomous unit tries to evade implementing a policy developed by the organization's senior management. Those units may also compete for resources, which may create tension. Finally, Mintzberg suggested that the greatest risk within divisionalized organizational structures is that administrators at the very top may lose touch with the needs of the operating units. For multi-college districts, district leaders might make policy decisions without fully understanding the consequences of such directives on students, faculty, and staff located much further down in the organizational hierarchy.

Conclusion

The impact of the structural design of California CC districts and student success has not been deeply examined. Although there have been some attempts to evaluate organizational structures of community colleges and how those structures impact student success (Calcagno et al., 2008; El Fattal, 2014), these studies have not fully examined at recent data for CC students or considered how the complex structures of California's CCs may affect student performance.

Chapter Three: Methodology

As demand for higher education quickly grew during the 1960s and 1970s, community colleges emerged as an efficient way to educate growing numbers of college students; these institutions played an important role in California's delivery of higher education. California CCs evolved as demands changed, and how the potential effect of their varied organizational structures on student success measures have gone largely unstudied. This research focuses on whether organizational structure (OS) impacts academic student success in California CCs, and seeks to determine if district structure and the percent of expenditures on instruction are predictors of student success outcomes.

Research Questions

The following research questions guide this study:

1. Controlling for institutional characteristics related to demographics of the student body, urbanicity, and institutional size, to what extent does the structure of the district in which California CCs operate account for variation in institutions' student success measures?

2. Does student success significantly correlate with the proportion of a college's expenditures related to student instruction, the percentage of full-time faculty, or the ratio of faculty to administrators?

Research Design

To find the relationship, if any, between CC structural organization (and their corresponding administrative expenditures) on the one hand, and student success on the other, I used data from the following sources: the CCCCO DataMart, the CCCCO Student Success Scorecard; the U.S. Department of Education website; and budget information made available by individual colleges. The analyses will test the extent to which district structures and instructional

expenditures, as a proportion of all expenses, correlate with student success measures after controlling for other institutional characteristics. Descriptive statistics, *t*-tests, and multiple linear regression will form the foundation for my analytic approach.

Data Source and Sample

Data will be obtained from the CCCCO databases, college websites, and the U.S. Department of Education from 2006, when SB 361 was enacted, to 2016. SB 361 established the current funding model used for California CCs (Legislative Analyst's Office, 2017b). It is appropriate to use 5 years of data during which the same model was used, as doing so eliminates the possibility that the funding model might be a confounding variable in the stepwise regression analysis. Each of the 114 California CCs will be included in the analysis in an effort to obtain the most comprehensive understanding whether and how the state's binary classification system of SCD or MCD impacts student success.

Variables to Be Considered

Predictor Variables

The predictor variables for this study are both components of organizational structure—district type and budget expenditures (see Table 2).

Table 2

Primary Independent Variables of Interest

Predictor variable	Description	Type of variable
District Type	MCD or SCD	Binary
Percent of Budget Spent on Instruction	How much of the districts' overall budget goes toward instruction?	Continuous

District type. In California, districts are either multi-college (MC) or single-college (SC), depending on how they have structured themselves.

Budget expenditures. Each district receives base funding from the state depending on college size (small, medium, or large), as well as funding based on their number of full-time students (CCCCO, 2012). In addition to these funds, a few "basic aid" districts receive funds from property taxes in their own district. All colleges also receive so-called "categorical" funds to be used pursuant to various state mandates. Each district must determine how these funds should be allocated between administration and instruction in the district and college.

Confounding Variables

To more accurately estimate the extent to which district structure and the proportion of budgets allocated to administrative expenses correlate with measures of student success, the analyses will also account for a standard set of institutional characteristics. The regression models will include the size of a college, its total expenditures, and its faculty-to-administrator ratio as controls that may relate both to the structure of the institution, as well as to measures of student success. Additionally, the analysis will account for the composition of students within the institution, including the proportion of students who enter as college-ready and the proportion of students receiving Pell Grants and Board of Governors Fee Waivers (known as BOG waivers). Kuh (2008) noted that underrepresented minorities have lower enrollment and persistence rates than do their white and Asian counterparts. Students from less affluent backgrounds also tend to perform more poorly, using traditional measures of college success, than do their more economically advantaged peers (Kuh, 2008). Further, the size of a college or university negatively correlates with student success (Kuh, 2008). Table 3 provides a list of control variables that will be included in the regression models.

Table 3

Definitions of Control Variables to Be Included in the Regression Models

Variables	Definition	Type of variable
Size of college	Total full-time student equivalents (FTSE)	Continuous
Total expenditures	Total expenditures from all sources	Continuous
Faculty-to-administrator ratio	Number of faculty for each college administrator	Continuous
Demographics of the College (from CCCCO Student Success Scorecard)	Average age of student, ethnicity, percent of under-represented minorities, and proportion who enter college-ready	Continuous
Demographics of the College (from the USDOE)	Percentages of full-time and part-time students	Continuous

Data on urbanicity was gathered from the National DOE College Scorecard (also known as IPEDs), which assigns a code to 10 levels of population density. In IPEDS, these codes are not ordered in a manner that is useful for comparison, so I assigned new codes from most urban (10) to most rural (1) as shown in Appendix.

Outcome Variables

Outcome variables will be gathered from two separate sources, the CCCCO Student Success Scorecard and IPEDs. Outcome variables from the CCCCO Student Success Scorecard are shown in Table 4 and include persistence, completion of 30 units, remedial math and/or English success, and completion of a degree, certificate, or transfer-related outcome.

Outcome variables from IPEDS are shown in Table 5 and include graduation rate and percentage of students who return after the first year.

Table 4

Student Success Outcome Variables as Defined by the CCCCO

Student success outcome variable	Definition from CCCCO	Type of variable
Persistence	Percentage of degree, certificate, or transfer-seeking students who began in one of the five 6-year tracked cohorts who enrolled in the first 3 consecutive terms	Continuous
30 Units	Percentage of degree, certificate, or transfer-seeking students who began in one of the five 6-year tracked cohorts and achieved at least 30 units	Continuous
Remedial (math and/or English)	Percentage of credit students who began in one of the five 6-year tracked cohorts and started in a course below transfer level in math and/or English and then completed a college level course in the same discipline	Continuous
Completion	Percentage of degree, certificate, or transfer-seeking students who began in one of the five 6-year tracked cohorts and who completed a degree, certificate, or transfer related outcome	Continuous

Source: CCCCO, 2017d

Table 5

Student Success Outcome Variables as Defined by the USDOE College Scorecard

Student success outcome variable	Definition of variable by USDOE College Scorecard	Type of variable
Graduation rate	The graduation rate within 150% of the expected time to completion (typically 3 years for schools that award predominantly 2-year degrees). These rates are only for full-time students who are enrolled for the first time.	Quantitative
Students who return after their first year	The share of first-time, full-time undergraduates who returned to the institution after their freshman year.	Quantitative

Source: Department of Education College Scorecard, 2017

Data Analysis

The analysis will seek to determine the existence of relationships between student success and organizational structure. After retrieving the data from the above-described sources and formatting it, I first used descriptive statistics to better understand the data. Frequency distributions, cross-tabulations, and *t*-tests were used to provide an overall portrait of the California Community College system between 2006 and 2016. These analyses may also provide insight into how student success measures have changed across the five cohorts included in this study. These initial analyses informed the final determination of independent predictors to be included in the regression models.

To more directly address the research questions posed in the study, the final phase of the analytic plan drew from multiple linear stepwise regression. The stepwise method of multiple regression analysis was utilized so each predictor variable could be correlated with the outcome while also controlling for the effects of the other predictor variables (Field, 2005). Casewise diagnostics were performed in order to obtain the observed and predicted values of the outcomes along with residual statistics. The results of collinearity diagnostics were examined to assess the assumption that there was no multi-collinearity between any of the predictor variables (Field, 2005). If there was collinearity among my predictor variables, it was necessary to address this redundancy.

Separate regression models were analyzed for each student success measure. Although my focus was on the significance, direction, and magnitude of the parameters associated with district structure and the proportion of budgets associated with instructional expenditures, I also reviewed the extent to which any of the control variables significantly relate to each outcome. I reported both standardized and unstandardized regression coefficients in order to show the actual

percentage point gaps associated with differences in district structure, as well as the overall importance of the key independent variables within the context of the larger regression model. I also reported the overall strength of the model as measured by the proportion of variance explained for each outcome measure.

Limitations

This study looked at existing data reported by 114 institutions in California. The variables and data used in this analysis were defined and collected by the CCCCO and the U.S. Department of Education and as such, I relied on these agencies for the accuracy of this information. The CCCCO and DOE defined some variables differently. For example, in describing small, medium, and large colleges, the state definitions (which affect funding) differed from the national definitions. In this case, I used the state definitions, as they were more relevant to the California CC model. This secondary data analysis means that the study is limited by state and national definitions of variables and by those variables state and federal policymakers have decided to measure. The state and national databases do not measure the success rates of teachers at institutions or turnover rates for teachers or administrators, although such variables might well be relevant to student success and institutional organization.

As colleges report their data, there is a possibility for variation in reporting/interpretation of state definitions across campuses. This study cannot detect this. There is also the possibility of missing data or erroneously reported data.

Aggregation at the institutional level masks important nuances within institutions across various student demographic groups. This study considered only data that colleges report to CCCCO and the USDOE, and thus individual student data is not captured in the databases. Using individual student data could improve this study insofar as it would allow for individual

nuances to be captured, but restrictions on access to student-level data at the system level would mean delaying the project by more than 6 months.

Conclusion

This study involved constructing spreadsheets with data from varying sources in an attempt to find what, if any, relationships exist between California CCs' organizational structures and their student success rates. Using the stepwise method of regression analysis on variables related to organizational structure and student success, this research has the potential to reveal relationships that might have been undiscovered prior to this analysis. Further, this study addresses a longstanding gap in the research pertaining to community college success with its investigation of the connection between district structure and measures of student outcomes.

Chapter Four: Findings

Introduction

This chapter highlights the findings from the descriptive and inferential analyses outlined in the previous chapter. These results illustrate the variability found across the California Community Colleges (CCCs) and examine the extent to which district structure, size, and college-level organization are associated with various measures of student success. Findings suggest that small colleges with fewer than 5,000 FTES have better success outcomes when they are in MCDs as opposed SCDs. Findings confirm other research (Kuh et al., 2015; Martinez-Wenl & Marquez, 2012; Pike et al., 2006) that shows lower rates of success are correlated with demographic variables such as race, socioeconomic status, and enrollment status (part-time vs. full-time). More specifically, findings suggest success rates are lower at campuses that enroll higher concentrations of Black and Latino students, serve larger proportions of Pell and BOG waiver students, and have a higher proportion of students attending part-time. This research also finds that larger colleges (as measured by FTES) have higher rates of student persistence, achievement of 30 units, and success in remedial English.

This chapter begins with numerical summaries of how the state's MCDs and SCDs vary by population size, urbanicity, instructional expenditures, percent of faculty who are full-time, the faculty-to-administrator ratio, and the student demographic variables described in the previous paragraph. After briefly summarizing the methods used to compile and organize data, the chapter moves into a discussion of the major findings from bivariate correlation, *t*-tests, and multiple regression analyses related to the study's research questions. Graphs and tables are included to further illustrate relevant findings. I present and explain the important associations

between student success and input variables. The final section of this chapter includes a brief description of challenges encountered while gathering the data.

The Lay of the Land--The RQs Context Shown Numerically

Of the 114 California CCs, this study examined data from the 108 institutions that provided key data elements between 2006 and 2016, which covers 6 years of data for five different cohorts that entered college between 2006 and 2010. The size and composition of the colleges vary greatly as can be seen in Table 6. Enrollment numbers range from a low of 1,760 FTES to a high of 29,008 FTES. The percent of students under 25 varies from just under 25% of the population at some colleges to nearly 75% at others. The proportion of students who complete a degree or certificate or who transfer to a 4-year institution varies from about 30% at some colleges to nearly 70% at others. Graduation rates for first-time, full-time students range from 13% to 53%. Furthermore, the faculty-to-administrator ratio spans from just 2 faculty per administrator up to 23 faculty per administrator.

The Lay of the Land--Highlighting Differences Between Single and Multi-Campus Districts

To further understand the complex way CCCs are organized, this section describes how colleges differ by district type on measures related to urbanicity, size in FTES, and demographic variables. The demographics include the percent of traditional students (usually considered those students who are under 25 and enrolled full time) and the socio-economic-status (SES) of students. BOG fee waivers and federal Pell grants are awarded to students based on need and can be used as a measure of SES.

Table 6

Descriptive Statistics for All Input Variables

Descriptive statistics	*N*	Minimum	Maximum	Mean	Std. deviation
Urbanicity	108	1	10	6.86	2.856
SCD or MCD	108	1	2	1.56	.499
District size	108	1	5	4.00	1.283
Size in FTES	108	1760	29008	10666.12	6255.874
% of students on BOG waivers	108	10	60	35.10	12.670
Faculity to administrator ratio	106	3	24	11.87	4.782
% spent on instruction	108	49	57	51.96	1.395
% full-time faculty	108	42	73	58.53	6.617
Persistence	108	52	84	70.12	6.411
At least 30 units completed	108	50	78	65.79	5.788
Completed	108	30	66	47.15	7.484
Success in remedial English	108	20	71	43.79	9.490
Success in remedial math	108	10	52	32.45	6.927
% of students on Pell grants	108	6	49	20.94	9.373
% Black and Hispanic students	108	10	90	36.10	16.996
% of students under 25	108	22	74	55.93	10.335
% of full time students	108	9	46	30.13	7.483
% of full-time and under 25	108	3	38	23.54	7.299
Graduation rate of first time, full time students	108	13	53	25.72	6.389
Valid *N* (listwise)	106				

Numerical Summary of District Type

Disaggregating CCCs by district organizational structure classifies 60 CCCs as operating in MCDs and 48 CCCs functioning as SCDs. We can describe the differences between the SCDs and MCDs in relation to the variables studied by comparing the means and variances of these variables grouped by district type. *T*-tests (means) and *F*-tests (variances) can be used to look for any significant differences for the two types of college districts. Based on the *t*-tests (see Tables 7 and 8), faculty-to-administrator ratio, percent of students receiving Pell grants, percent of full-time students, urbanicity, and district size have significantly different means for the two district types, SCD and MCD. Based on *F*-tests (see Table 9), percent spent on instruction, remedial English success, percent of full-time faculty, percent of students receiving Pell grants,

Table 7

Numerical Summary of District Type and Input Variables

Comparison of SCDs and MCDs for input variables

SCD or MCD		Size of college measured by FTES	Percent students receiving BOG waiver	Urbani-city	District size	Faculty to adminis-trator ratio	Percent of funds spent on instruction	Percent faculty who are full time	Percent students receiving Pell Grants	Percent of Black and Hispanic students	Percent students under 25	Percent full time students	Percent full time under 25
SCDs	*N*	48	48	48	48	47	48	48	48	48	48	48	48
	Mean	10886.92	32.94	5.65	3.06	10.36	51.89	57.19	23.23	33.73	55.58	32.19	25.19
	Median	9425.45	32.00	7.00	3.00	9.87	51.45	56.34	21.00	31.50	58.50	32.50	26.00
	Minimum	1760	10	1	1	3	49	42	8	10	22	12	8
	Maximum	29008	58	10	5	24	57	73	49	77	73	46	37
	Std. Deviation	7004.930	12.328	3.014	1.311	4.750	1.679	7.777	10.348	15.711	10.689	7.049	6.545
MCDs	*N*	60	60	60	60	59	60	60	60	60	60	60	60
	Mean	10489.48	36.83	7.83	4.75	13.07	52.01	59.61	19.10	38.00	56.20	28.48	22.22
	Median	9365.90	36.00	8.50	5.00	12.62	52.02	59.72	19.00	32.50	58.00	29.00	23.00
	Minimum	2262	12	2	2	3	50	49	6	12	24	9	3
	Maximum	25640	60	10	5	23	55	72	44	90	74	43	38
	Std. Deviation	5640.486	12.775	2.323	.571	4.492	1.130	5.344	8.144	17.860	10.126	7.469	7.649
Total	*N*	108	108	108	108	106	108	108	108	108	108	108	108
	Mean	10666.12	35.10	6.86	4.00	11.87	51.96	58.53	20.94	36.10	55.93	30.13	23.54
	Median	9373.20	35.00	7.00	5.00	11.50	51.97	59.15	20.00	32.00	58.00	30.00	24.00
	Minimum	1760	10	1	1	3	49	42	6	10	22	9	3
	Maximum	29008	60	10	5	24	57	73	49	90	74	46	38
	Std. Deviation	6255.874	12.670	2.856	1.283	4.782	1.395	6.617	9.373	16.996	10.335	7.483	7.299

urbanicity, and district size have significantly different variances for the two district types. In the following sections, I use histograms to graphically depict the differences and similarities between MCDs and SCDs to highlight the results of the mean comparison tests.

Table 8

Numerical Summary of District Type and Target Variables Variables

Comparison of SCDs and MCDs for target variables

SCD or MCD		Percent students who persist 3 semesters	Percent students who earn 30 units	Percent students who transfer or earn a degree or certificate	Percent students who succeed in remedial English	Percent students who succeed in remedial math	Percent completers-male	Graduation rate for first time / full time students
SCDs	*N*	48	48	48	48	48	48	48
	Mean	69.15	65.08	46.13	42.81	32.69	46.15	26.33
	Median	70.50	65.50	45.00	43.50	32.00	46.00	26.00
	Minimum	52	50	30	20	16	33	16
	Maximum	81	76	62	55	49	59	40
	Std. Deviation	6.716	5.805	6.775	7.690	6.569	5.078	5.179
MCDs	*N*	60	60	60	60	60	60	60
	Mean	70.90	66.35	47.97	44.57	32.27	45.97	25.23
	Median	72.00	66.00	46.00	45.00	32.00	45.50	24.00
	Minimum	57	51	32	24	10	34	13
	Maximum	84	78	66	71	52	61	53
	Std. Deviation	6.100	5.760	7.968	10.716	7.251	4.991	7.219
Total	*N*	108	108	108	108	108	108	108
	Mean	70.12	65.79	47.15	43.79	32.45	46.05	25.72
	Median	71.00	66.00	46.00	44.00	32.00	46.00	25.00
	Minimum	52	50	30	20	10	33	13
	Maximum	84	78	66	71	52	61	53
	Std. Deviation	6.411	5.788	7.484	9.490	6.927	5.007	6.389

Table 9

T-Test and F-Test for District Type and Independent Variables

Independent samples test

		Levene's test for equality of variances		*t*-test for equality of means						
									95% confidence interval of the difference	
		F	Sig	*t*	df	Sig (2-tailed)	Mean differ-ence	Std. error differ-ence	Lower	Upper
Size in FTES	Equal variances assumed	2.038	.156	.327	106	.745	397.439	1216.533	-2014.457	2809.335
	Equal variances not assumed			.319	89.270	.750	397.439	1246.003	-2078.239	2873.117
Percent of students On BOG waiver	Equal variances assumed	.004	.952	-1.599	106	.113	-3.896	2.436	-8.725	.933
	Equal variances not assumed			-1.606	102.297	.111	-3.896	2.426	-8.708	.916
Faculty to admin ratios	Equal variances assumed	.001	.981	-3.015	104	.003	-2.716	.901	-4.503	-.930
	Equal variances not assumed			-2.996	96.177	.003	-2.716	.907	-4.516	-.916
Percent spent on instrruction	Equal variances assumed	7.875	.006	-.452	106	.652	-.122	.271	-.660	.415
	Equal variances not assumed			-.433	78.975	.666	-.122	.283	-.686	.441
Percent FTFTEF	Equal variances assumed	9.936	.002	-1.915	106	.058	-2.423	1.266	-4.933	.086
	Equal variances not assumed			-1.839	80.107	.070	-2.423	1.318	-5.046	.199
Persistence	Equal variances assumed	.061	.805	-1.420	106	.159	-1.754	1.236	-4.204	.695
	Equal variances not assumed			-1.405	96.148	.163	-1.754	1.249	-4.233	.725
At least 30 units	Equal variances assumed	.130	.719	-1.132	106	.260	-1.267	1.119	-3.486	.952
	Equal variances not assumed			-1.131	100.523	.261	-1.267	1.120	-3.489	.956
Completion	Equal variances assumed	1.119	.293	-1.274	106	.205	-1.842	1.445	-4.707	1.023
	Equal variances not assumed			-1.298	105.581	.197	-1.842	1.419	-4.656	.972
Remedial English success	Equal variances assumed	5.872	.017	-.954	106	.342	-1.754	1.838	-5.399	1.891
	Equal variances not assumed			-.989	104.861	.325	-1.754	1.774	-5.271	1.763
RemedialMathSuccess	Equal variances assumed	.809	.370	.312	106	.755	.421	1.347	-2.250	3.092
	Equal variances not assumed			.316	104.320	.753	.421	1.332	-2.221	3.063

Table 9. Continued

		Levene's test for equality of variances		*t*-test for equality of means						
									95% confidence interval of the difference	
		F	Sig	*t*	df	Sig (2-tailed)	Mean differ-ence	Std. error differ-ence	Lower	Upper
Percent Pell Grant 08 to 10	Equal variances assumed	4.712	.032	2.321	106	.022	4.129	1.779	.602	7.656
	Equal variances not assumed			2.261	87.925	.026	4.129	1.827	.499	7.759
Average Percent Black Hispanic 08to09	Equal variances assumed	.617	.434	-1.302	106	.196	-4.271	3.281	-10.775	2.233
	Equal variances not assumed			-1.321	105.008	.190	-4.271	3.234	-10.683	2.142
percent under25	Equal variances assumed	.499	.482	-.307	106	.760	-.617	2.010	-4.602	3.368
	Equal variances not assumed			-.305	98.337	.761	-.617	2.022	-4.629	3.396
PercentF T	Equal variances assumed	.290	.591	2.626	106	.010	3.704	1.411	.907	6.501
	Equal variances not assumed			2.643	103.091	.010	3.704	1.402	.924	6.484
PercentF T and Unde r25	Equal variances assumed	2.405	.124	2.136	106	.035	2.971	1.391	.214	5.728
	Equal variances not assumed			2.174	105.493	.032	2.971	1.367	.261	5.680
Average grad rate 150 percent time FT and first try	Equal variances assumed	1.683	.197	.888	106	.376	1.100	1.238	-1.355	3.555
	Equal variances not assumed			.921	104.855	.359	1.100	1.195	-1.269	3.469
urbanicity	Equal variances assumed	10.743	.001	-4.260	106	.000	-2.188	.513	-3.206	-1.169
	Equal variances not assumed			-4.140	86.684	.000	-2.188	.528	-3.238	-1.137
District size	Equal variances assumed	23.618	.000	-8.969	106	.000	-1.688	.188	-2.061	-1.314
	Equal variances not assumed			-8.308	61.229	.000	-1.688	.203	-2.094	-1.281

Input Variables and District Type

District Type and Urbanicity

The results of the *t*-test (see Figure 9) show a significant difference in the mean urbanicity of colleges in SCDs and MCDs (significance of .000***). Moreover, the *F*-test also shows a significant difference in the variance of urbanicity of colleges in SCDs (mean = 5.65)

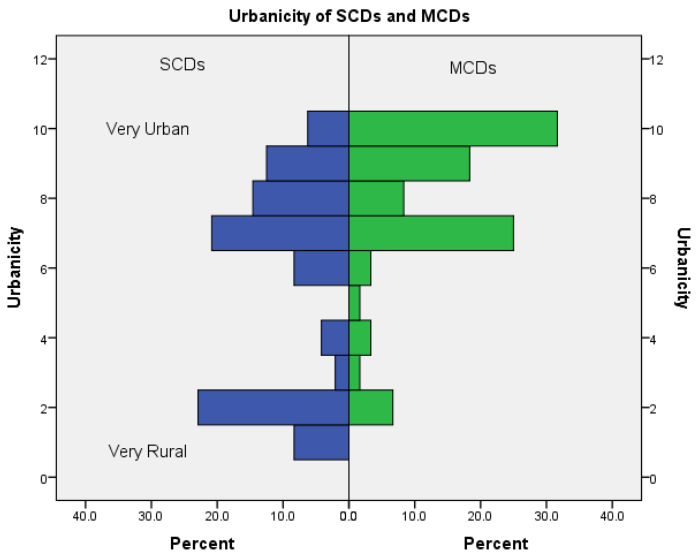

Figure 9. District structure and urbanicity on a rural (1) to urban (10) scale.

and MCDs (mean = 7.83; significance of .001***). The bivariate correlation Table 10 confirms this significant association between district type and urbanicity (r = .382, p < .000***).

Although the statistically significant t statistic and correlation coefficient are noteworthy, comparisons of the distributions of MCD colleges and SCD colleges by urbanicity are most informative. About 50% of colleges in MCDs and 20% of colleges in SCDs are in the most urban category. About 8% of colleges in MCDs are in the most rural category, while about 30% of colleges in SCDs are in this category. About 30% of the most urban colleges are in SCDs, with 70% in MCDs. About 75% of the most rural colleges are in SCDs, with 25% in MCDs.

The side-by-side histogram in Figure 9 shows that urban colleges are more likely to be in MCDs as compared to rural colleges, which is further supported by the statistically significant correlation coefficient and significantly different means presented at the opening of this section. This association makes sense because new centers (which might later become colleges) have historically been built by existing colleges, to serve students in expanding areas. This is how

Table 10

Bi-variate Correlations Among All Input and Target Variables

Correlations

		Urbanicity	SCD or MCD	District size	Size in FTES	Percent of students on BOG waiver	Faculty to administrator ratio	Percent spent on instruction	Percent full-time faculty	Persistence	At least 30 unites	Completion	Remedial English success	Remedial Math Success	Percent receiving Pell Grants	Percent Black or Hispanic	Percent under 25	Percent full-time	Percent full-time and under 25	Graduation rate for first time full time students
Urbanicity	Pearson Correlation	1																		
	N	108																		
SCD or MCD	Pearson correlation	.382	1																	
	Sig (2-tailed)	.000																		
	N	108	108																	
District size	Pearson correlation	.651	.657	1																
	Sig (2-tailed)	.000	.000																	
	N	108	108	108																

		Urbanicity	SCD or MCD	District size	Size in FTES	Percent of students on BOG waiver	Faculty to administrator ratio	Percent spent on instruction	Percent full-time faculty	Persistence	At least 30 unites	Completion	Remedial English success	Remedial Math Success	Percent receiving Pell Grants	Percent Black or Hispanic	Percent under 25	Percent full-time	Percent full-time and under 25	Graduation rate for first time full time students
Size in FTES	Pearson correlation	.466	.032	.514	1															
	Sig (2-tailed)	.000	745	.000																
	N	108	108	108	108															
Percent of students on BOG waiver	Pearson correlation	.121	.154	.072	-.039	1														
	Sig (2-tailed)	.213	.113	.456	.686															
	N	108	108	108	108	108														
Faculty to administrator ratio	Pearson correlation	.435	.284	.479	.254	.219	1													
	Sig (2-tailed)	.000	.003	.000	.008	.024														
	N	106	106	106	106	106	106													

		Urbanicity	SCD or MCD	District size	Size in FTES	Percent of students on BOG waiver	Faculty to administrator ratio	Percent spent on instruction	Percent full-time faculty	Persistence	At least 30 unites	Completion	Remedial English success	Remedial Math Success	Percent receiving Pell Grants	Percent Black or Hispanic	Percent under 25	Percent full-time	Percent full-time and under 25	Graduation rate for first time full time students
Percent spent on instruction	Pearson correlation	.204	.044	.296	.251	.007	.397	1												
	Sig (2-tailed)	.034	.652	.002	.009	.941	.000													
	N	108	108	108	108	106	108	108												
Percent full-time faculty	Pearson correlation	.147	.183	.229	.126	.049	-.024	.073	1											
	Sig (2-tailed)	.129	.058	.017	.195	.611	.805	.451												
	N	108	108	108	108	108	106	108	108											
Persistence	Pearson correlation	.337	.137	.460	.616	-.185	.135	.190	.375	1										
	Sig (2-tailed)	.000	.159	.000	.000	.055	.168	.049	.000											
	N	108	108	108	108	108	106	108	108	108										

		Urbanicity	SCD or MCD	District size	Size in FTES	Percent of students on BOG waiver	Faculty to administrator ratio	Percent spent on instruction	Percent full-time faculty	Persistence	At least 30 unites	Completion	Remedial English success	Remedial Math Success	Percent receiving Pell Grants	Percent Black or Hispanic	Percent under 25	Percent full-time	Percent full-time and under 25	Graduation rate for first time full time students
At least 30 unites	Pearson correlation	.253	.109	.403	.472	-.481	.126	.291	.241	.688	1									
	Sig (2-tailed)	.008	.260	.000	.000	.000	.198	.002	.012	.000										
	N	108	108	108	108	108	106	108	108	108	108									
Completion	Pearson correlation	.167	.123	.313	.320	-.578	.030	.184	.065	.528	.742	1								
	Sig (2-tailed)	.084	.205	.001	.001	.000	.763	.057	.503	.000	.000									
	N	108	108	108	108	108	106	108	108	108	108	108								
Remedial English success	Pearson correlation	.156	.092	.280	.382	-.533	.012	.239	.105	.566	.757	.744	1							
	Sig (2-tailed)	.107	.342	.003	.000	.000	.905	.013	.282	.000	.000	.000								
	N	108	108	108	108	108	106	108	108	108	108	108	108							

		Urbanicity	SCD or MCD	District size	Size in FTES	Percent of students on BOG waiver	Faculty to administrator ratio	Percent spent on instruction	Percent full-time faculty	Persistence	At least 30 unites	Completion	Remedial English success	Remedial Math Success	Percent receiving Pell Grants	Percent Black or Hispanic	Percent under 25	Percent full-time	Percent full-time and under 25	Graduation rate for first time full time students
Remedial Math Success	Pearson correlation	.081	-.030	.136	.206	-.478	.104	.143	-.098	.364	.612	.639	.638	1						
	Sig (2-tailed)	.404	.755	.161	.033	.000	.290	.139	.314	.000	.000	.000	.000							
	N	108	108	108	108	108	106	108	106	108	108	108	108	108						
Percent receiving Pell Grants	Pearson correlation	-.120	-.220	-.236	-.031	.730	-.011	.022	.080	-.085	-.351	-.498	-.421	-.333	1					
	Sig (2-tailed)	.216	.022	.014	.747	.000	.914	.820	.409	.384	.000	.000	.000	.000						
	N	108	108	108	108	108	106	108	108	108	108	108	108	108	108					
Percent Black or Hispanic	Pearson correlation	.337	.125	.232	.064	.431	.256	.120	.104	-.086	-.259	-.485	-.395	-.417	.334	1				
	Sig (2-tailed)	.000	.196	.016	.511	.000	.008	.217	.282	.378	.007	.000	.000	.000	.000					
	N	108	108	108	108	108	106	108	108	108	108	108	108	108	108	108				

		Urbanicity	SCD or MCD	District size	Size in FTES	Percent of students on BOG waiver	Faculty to administrator ratio	Percent spent on instruction	Percent full-time faculty	Persistence	At least 30 unites	Completion	Remedial English success	Remedial Math Success	Percent receiving Pell Grants	Percent Black or Hispanic	Percent under 25	Percent full-time	Percent full-time and under 25	Graduation rate for first time full time students
Percent under 25	Pearson correlation	.134	.030	.292	.404	.078	.121	.269	-.057	.460	.385	.318	.384	.301	.231	.053	1			
	Sig (2-tailed)	.168	.760	.002	.000	.425	.215	.005	.555	.000	.000	.001	.000	.002	.016	.589				
	N	108	108	108	108	108	106	108	108	108	108	108	108	108	108	108	108			
Percent full-time	Pearson correlation	.259	-.247	-.129	.208	.167	-.115	.113	-.030	.272	.232	.120	.175	.131	.482	-.083	.720	1		
	Sig (2-tailed)	.007	.010	.185	.031	.085	.242	.243	.759	.004	.016	.216	.070	.176	.000	.393	.000			
	N	108	108	108	108	108	106	108	108	108	108	108	108	108	108	108	108	108		
Percent full-time and under 25	Pearson correlation	-.169	-.203	-.008	.314	-.035	-.090	.186	-.012	.436	.433	.327	.381	.320	.290	-.124	.836	.938	1	
	Sig (2-tailed)	.080	.035	.935	.001	.719	.360	.055	.902	.000	.000	.001	.000	.001	.002	.202	.000	.000		
	N	108	108	108	108	108	106	108	108	108	108	108	108	108	108	108	108	108	108	

		Urbanicity	SCD or MCD	District size	Size in FTES	Percent of students on BOG waiver	Faculty to administrator ratio	Percent spent on instruction	Percent full-time faculty	Persistence	At least 30 unites	Completion	Remedial English success	Remedial Math Success	Percent receiving Pell Grants	Percent Black or Hispanic	Percent under 25	Percent full-time	Percent full-time and under 25	Graduation rate for first time full time students
Graduation rate for first time full time students	Pearson correlation	.027	-.086	.032	.254	-.592	-.020	.162	-.104	.244	.668	.742	.612	.651	-.446	-.482	.230	.190	.348	1
	Sig (2-tailed)	.785	.376	.743	.008	.000	.837	.093	.282	.011	.000	.000	.000	.000	.000	.000	.017	.049	.000	
	N	108	108	108	108	108	106	108	108	108	108	108	108	108	108	108	108	108	108	108

many SCDs became MCDs (Beach, 2012; Brossman & Roberts, 1973). In lightly populated areas, or areas where little growth occurs, a single college might serve an entire county. About a third of the colleges in the most rural areas were in SCDs, as opposed to less than 10% of these types of colleges being in MCDs. More than half of the most urban colleges were in MCDs, while only about a third of these types of colleges were in SCDs.

District Type and Size

In addition to urbanicity, district structure is associated with district size. The results of the *t*-test (see Table 9) show a significant difference in the mean district size of colleges in SCDs (mean = 3.06) and MCDs (mean = 4.75; significance of .000***). The bivariate correlation Figure 10 confirms this significant association between district type and district size ($r = 0.657$, $p < 0.000$***).

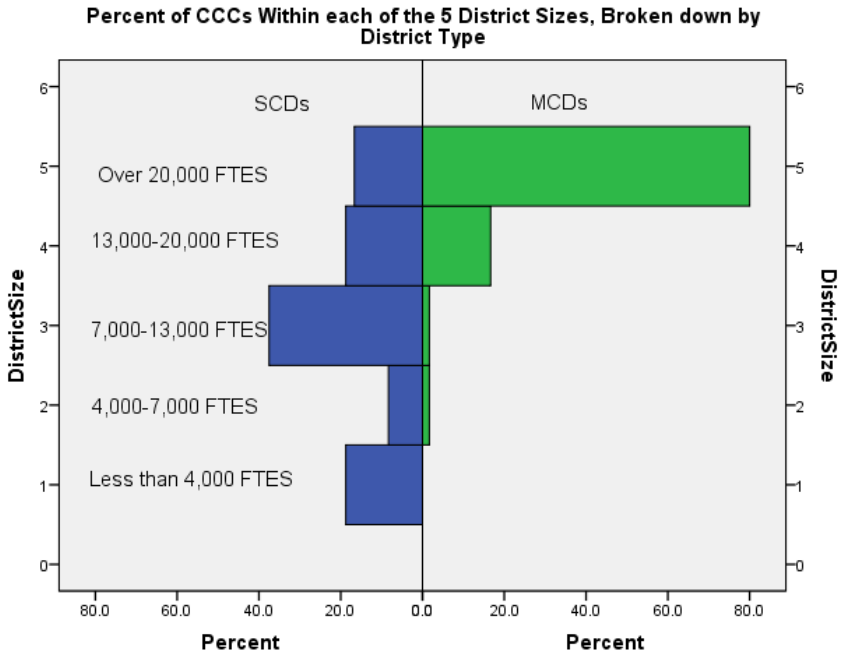

Figure 10. Percent of CCCs within each of the 5 district sizes broken down by district type.

Using the ranking of the 311 report from the CCCCO on district size (CCCCO, 2017b), we see that more than half (52%) of the colleges are in districts that serve more than 20,000 FTES (as shown by level 5), with the majority of these large districts operating as MCDs. Although large colleges are more likely to be in MCDs, eight colleges located in SCDs enroll more than 20,000 FTES--El Camino, Long Beach, Mount San Antonio, Palomar, Pasadena, San Francisco, Santa Monica, and Santa Rosa. The largest colleges in SCDs often have more than one campus/center. For example, an online description of San Francisco City College notes that the institution "serves approximately 70,000 students each year at Ocean Campus, CCSF's eight Centers, and various other instructional sites" (City College of San Francisco, 2017).

As seen in Table 11, 80% of MCD colleges are in districts that enroll at least 20,000 FTES, compared to just one in six SCD colleges in this largest district category. At the lower end of the scale, all MCDs serve more than 4,000 FTES districts, while 18.8% of SCDs are categorized as the smallest districts. This general trend is not surprising given that we would expect district-level enrollment to be larger in districts that include multiple colleges.

Table 11

Total District-Level FTES Enrollment by Type of District

	1 (fewer than 4,000 FTES)	2 (4,000-7,000 FTES)	3 (7,000-13,000 FTES)	4 (13,000-20,000 FTES)	5 (over 20,000 FTES)
SCD	18.8%	8.3%	37.5%	18.8%	16.7%
MCD		1.7%	1.7%	16.7%	80.0%

District type and size of college as measured by full-time equivalent students (FTES). Colleges can also be classified by their size as measured by FTES. There is no statistically significant correlation between district type and college size, although we can see

that colleges with less than 5,000 FTES are more likely to be in SCDs (22% versus 16% in MCDs) in Figure 11). As I describe later in this chapter, smaller colleges operating in SCDs tend to have lower student success rates compared to similarly sized colleges located in MCDs. Additionally, the largest California community colleges operate in SCDs.

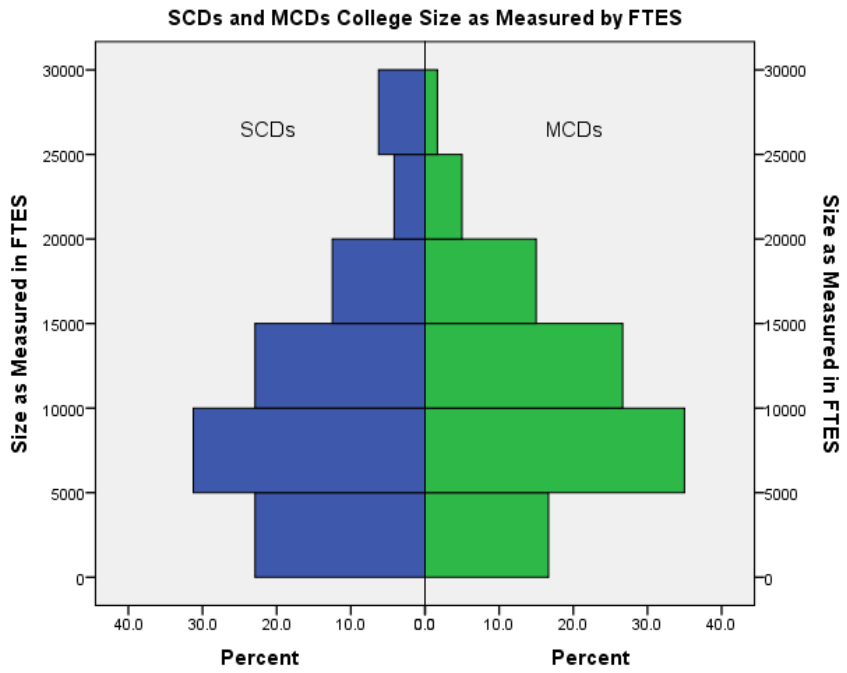

Figure 11. Size of Colleges in SCDs and MCDs as measured by FTES.

District Type and Percent of Traditional Students

SCDs are more likely to serve "traditional" students (generally considered to be those enrolled full-time and under 25 years old). The results of the *t*-test (see Table 9) show a significant difference in the mean percent of traditional students enrolled in SCD (mean = 25.19%) and MCD (mean = 22.22%) colleges (significance of .035*). The bivariate correlation (see Figure 12) confirms this statistically significant association between district type and the college's percent of traditional students (r = -.203, p = .035*). It makes sense that colleges that enroll greater proportions of traditional students have higher rates of student success, as full-time

students generally tend to succeed at higher rates than their part-time counterparts. Despite the fact that SCDs have higher enrollment rates among traditional students, their student success rates are consistently lower than their MCD counterparts.

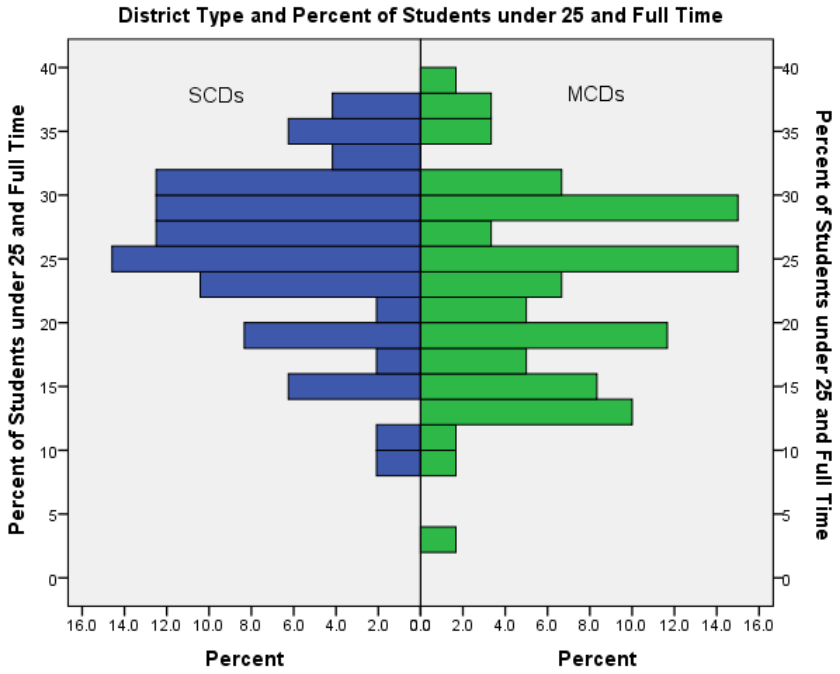

Figure 12. District type and percent of "traditional" students.

Instructional Expenditures by District Type

Colleges in both MCDs and SCDs typically reported spending a majority of their funds on instruction. The CCCCO requires that at least 50% of funds sent to CCs be used for instruction (Legislative Analyst's Office, 2017b).

The results of the *t*-test (see Table 9) show no significant difference between MCDs and SCDs in the average proportion of expenditures allocated to instruction, and the lack of a statistically significant correlation coefficient further confirms the lack of an association between instructional expenditures and district type. However, the *F*-test shows a significant difference in the variance of percent spent on instruction at colleges in SCDs and MCDs (significance of

.006**), and this variability by district type is illustrated in Figure 13). Compared to colleges in MCDs, SCD colleges tend to have significantly more dispersion with respect to the proportion of funds allocated to instructional expenses. For example, all colleges in MCDs spend between 50 and 55% of funds on instructional activities. By contrast, several SCD colleges fell outside this range.

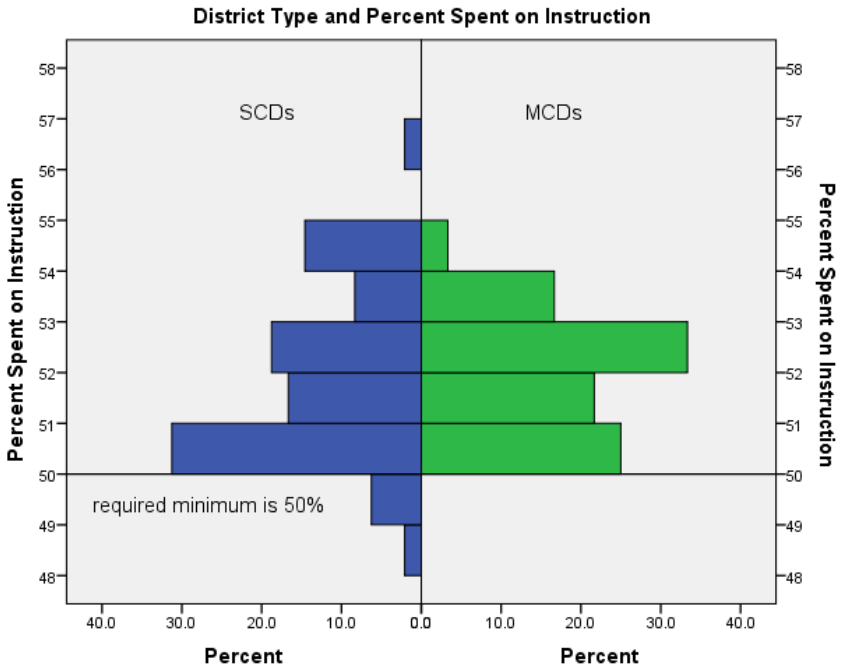

Figure13. Percent of funds spent on instruction.

As can also be seen in the side-by-side histogram (see Figure 13), the only colleges that spend less than 50% of their funds on instruction are the six colleges in SCDs with fewer than 5,000 FTESs (seen in the bottom left portion of the plot). The state established the 50% law with the feeling that a minimum amount of money must be spent on instruction in order to achieve student success (Morse, 2014). It might interesting to look at these colleges to see why they struggle to meet the requirements.

Proportion of Students Receiving Bog Waivers by District Type

We can also see how district structure relates to the differences in the percent of students receiving BOG waivers across CCCs. BOG waivers serve as a proxy measure for SES, as only students with financial need can qualify for them. CCCApply (2017) suggest no clear pattern with respect to variation in the proportion of students receiving BOG waivers by district structure. The lack of a statistically significant correlation coefficient provides additional evidence that no relationship between the proportion of students on BOG waivers and district type exists. This finding suggests that the composition of students by socioeconomic status does not statistically differ based upon a college district's organizational structure. (See Figure 14.)

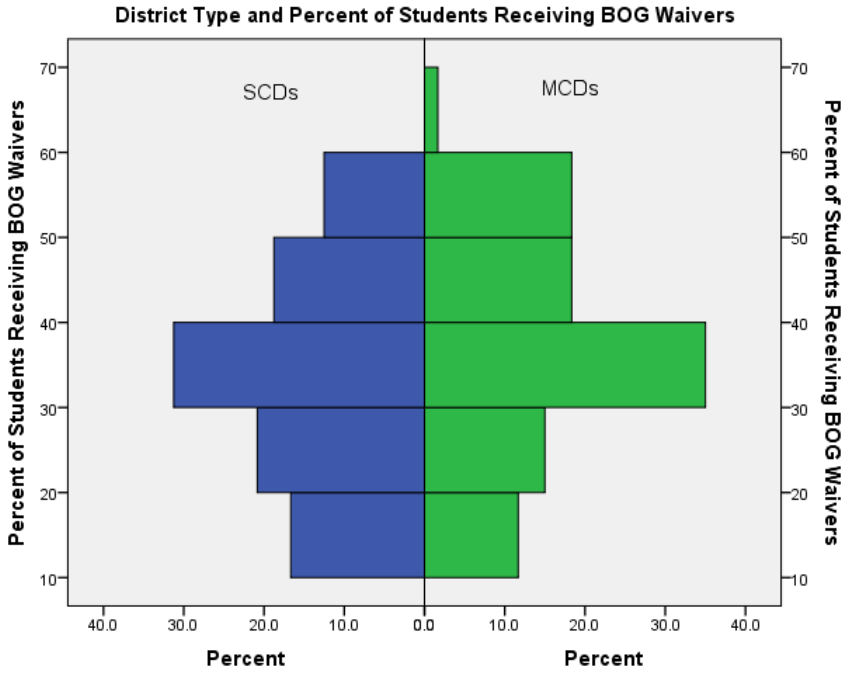

Figure 14. District type and percent of students receiving BOG waivers.

District Type and Pell Grants

The proportion of students receiving Pell grants represents an alternative measure of SES (to the BOG waiver) among students enrolled at each community college. Analyses suggest that

SCD colleges have a significantly greater proportion of students receiving Pell grants when compared to colleges operating in MCDs (see Figure 15).

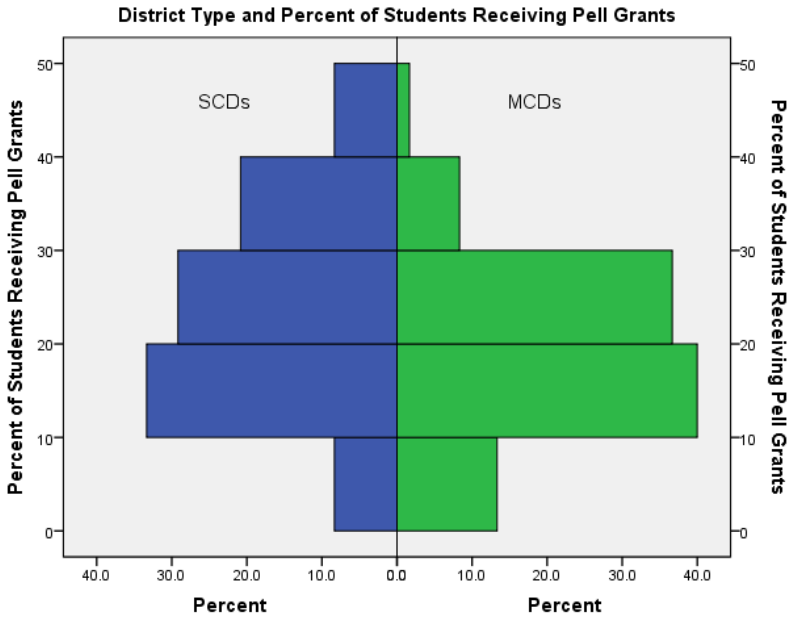

Figure 15. District type and percent of students who receive Pell grants.

The results of the *t*-test (see Table 9) show a statistically significant difference between colleges in SCDs (mean = 23.23%) and those in MCDs (mean = 19.10%) in the mean percent of students receiving Pell grants (significance of .022*). The bivariate correlation Table 10 confirms this significant association between district type and urbanicity (r = -.220, p = .022*).

The percent of students receiving Pell grants is greater at colleges within SCDs. About one-third of all colleges in SCDs have 30% or more of their students receiving Pell grants. Almost 10% of colleges in SCDs have more than 40% of students receiving Pell grants and another 20% of colleges in SCDs have between 30-40% of students receiving Pell grants. By contrast, only 2% of colleges within MCDs have more than 40% of students receiving Pell grants, with another 10% of MCD colleges with student enrollments where 30-40% receive Pell grants. Differences in the proportions of students receiving Pell grants could be a factor that

correlates with institutions' student success rates, and future studies should further investigate this possibility.

District Type and the Percent of Full-time Faculty

The results of the *t*-test (see Table 9) show no significant difference in the mean percent of full-time faculty at colleges in SCDs (mean = 57.19%) and MCDs (mean = 59.61%), which is also confirmed by the lack of a statistically significant correlation coefficient for these two variables. Although MCD and SCD colleges do not significantly differ with respect to the mean proportion of full-time faculty they employ, the data show that districts diverge considerably with respect to the most extreme ends of the range, as evidenced by the statistically significant *F*-test and the visual depiction of the data in Figure 16. For example, about one-fifth of all SCD institutions rely heavily (50% or more) on part-time faculty while just 2% of MCD institutions do the same. By contrast, 22% of colleges in MCDs and 13% of colleges in SCDs have at least two-thirds of their faculty in full-time appointments.

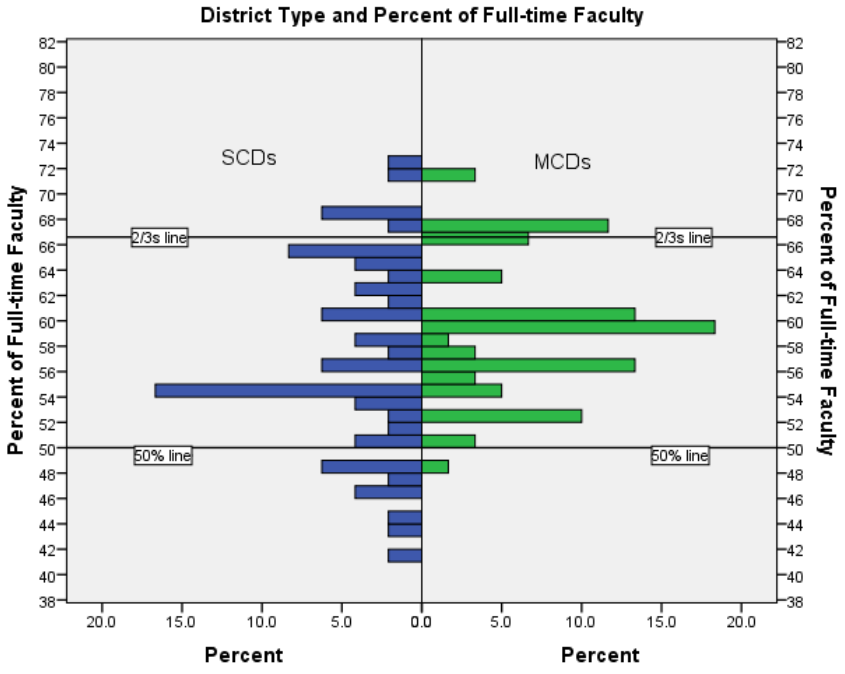

Figure 16. District type and percent of full-time faculty.

District Type and Faculty-to-Administrator Ratio

There is a statistically significant association between district type and a college's faculty-to-administrator ratio. The results of the *t*-test (see Table 9) show a significant difference in the mean faculty-to-administrator ratios at colleges in SCDs (mean = 10.36) and MCDs (mean = 13.07; significance of .003**). The bivariate correlation Table 10 confirms this significant association (r = .284 p = .003**).

MCDs are more likely to have a higher number of faculty members per administrator than SCDs as can be seen in Figure 17. More than half of all colleges in SCDs (52%) have a ratio below 10 to 1 while less than one-third of colleges in MCDs (30%) have a ratio below 10 to 1. Conversely, fewer than one in five colleges in SCDs (19%) have a ratio above 15 to 1 compared to more than one-third of the institutions in MCDs (37%) that have the same ratio. As the size of colleges within SCDs increases, we typically see higher faculty-to-administrator ratios. This type of pattern is not as pronounced for colleges in MCDs.

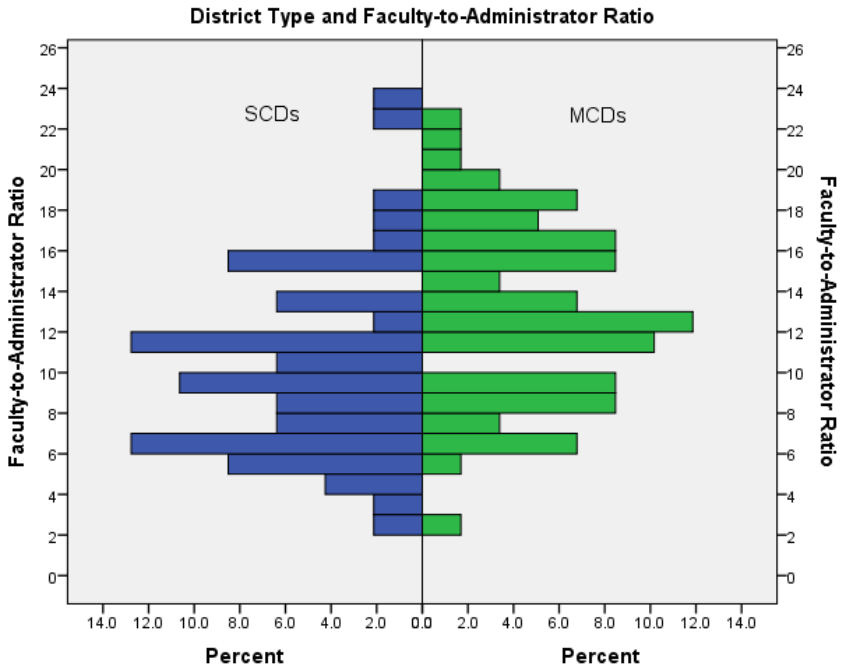

Figure 17. District type and faculty-to-administrator ratio.

Having a low faculty-to-administrator ratio suggests inefficiency at a college. The greater ratio of faculty to each administrative position means that the school can spend a higher percent of funds on direct instruction. The smallest colleges in SCDs still needs a president, vice president, and deans, but not nearly as many faculty members to serve their relatively small number of students. If these small colleges were part of MCDs, it is likely that an economy of scale would result in a greater ratio of faculty to administrator and allow the school to spend more money on instruction and student services.

District Type and Student Success Correlations

A simple look at bivariate correlations suggests that district type is not significantly associated with any of the success measures included in this study. However, institutional size has a statistically significant relationship with student success; larger institutions tend to have better student success outcomes compared to smaller institutions. Most notably, among the smallest colleges, analyses also reveal a significant difference by district type: small colleges in SCDs have lower student success rates than small colleges in MCDs. This study noted that the smallest colleges in SCDs rely more heavily on part-time faculty. This study also noted that the smallest colleges in SCDs spend more money on administration, which may result in less money being spent on instruction and student services. These two factors could partially explain lower student success for these small colleges within SCDs. As expected, all success measures have a negative association with the percentage of students receiving BOG waivers/Pell Grants.

District Type and Persistence

Based on *t*-tests and correlation analysis, I found no statistically significant association between district type and whether degree-seeking students persist for their first three consecutive semesters (see Figure 18) Persistence is clustered around 70%-75% for both SCDs and MCDs,

but the lowest levels of persistence occur exclusively in SCDs. There are other variables that correlated with persistence, such as the percent of "traditional" college students (under 25 and full-time), urbanicity, percent of full-time faculty, and the percent of funds spent on instruction. These associations are examined in the section on regression.

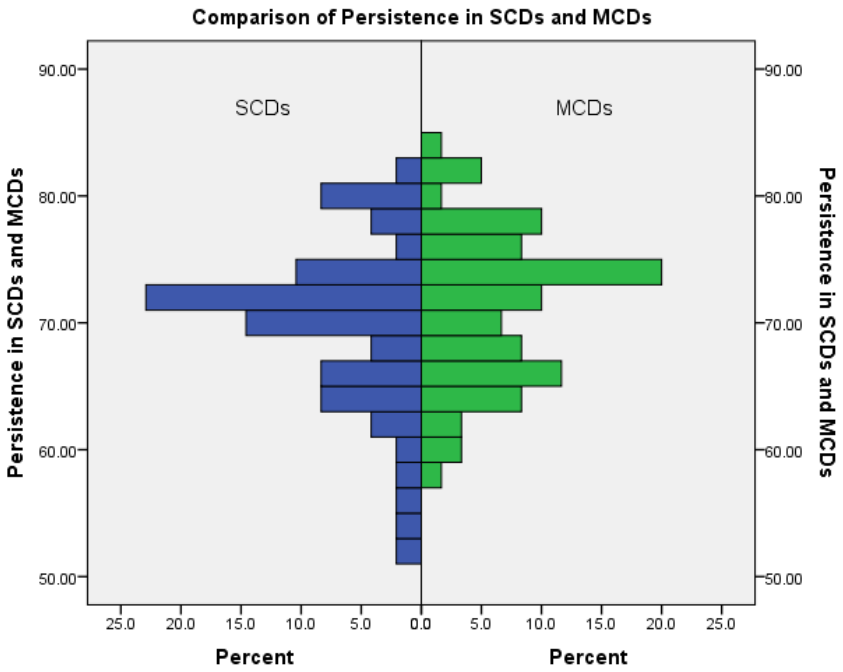

Figure 18. District type and student persistence as a measure of student success.

District Type and Students Who Achieve at Least 30 Units

As can be seen in Figure 19, the percent of students who achieve at least 30 units over a 6-year period varies between 50% and 80%. Using *t*-tests and correlation analysis, I found no significant association between district type and the proportion of students who earn at least 30 credits. However, the percent of students who achieve at least 30 units is associated with college urbanicity, district size, size in FTES, percent of students on BOG waivers or Pell grants, percent spent on instruction, percent of full time faculty, percent of black or Hispanic students, and percent of students who are under 25 and full time.

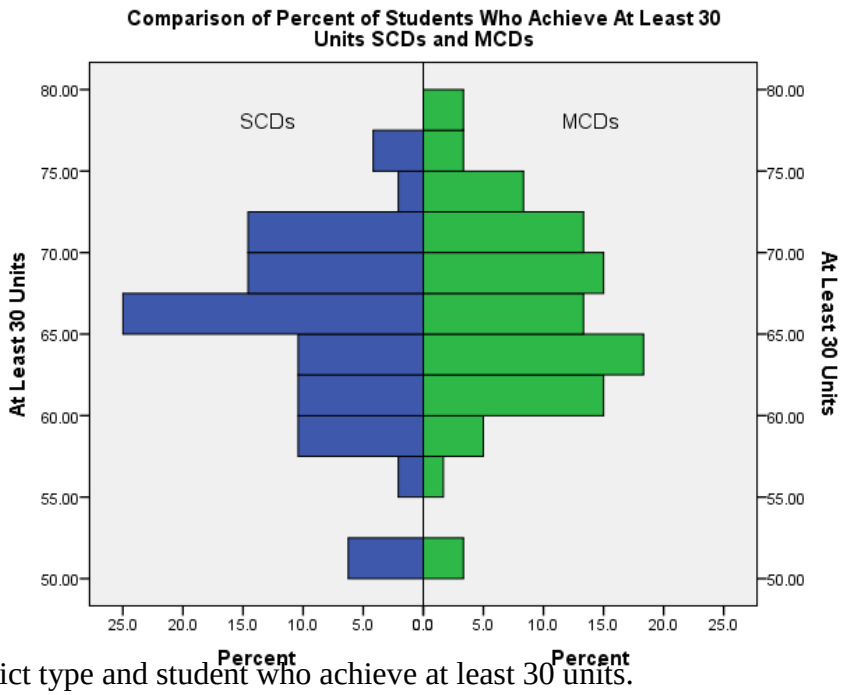

Figure 19. District type and student who achieve at least 30 units.

District Type and Completion

Students who successfully transfer out of a community college or complete a degree or certificate within the 6 years they are tracked, are considered "completers." Based on *t*-tests and correlation analysis, the proportion of students classified as "completers" is not significantly associated with district type. As with other variables (such as percent of students on BOG waiver), we see a great variability among colleges in terms of student completion rates. The range goes from a low of 30% to a high of almost 70% among CCCs, which suggests substantial variation across the system with respect to degree completion. (See Figure 20.)

District Type and Success in Remedial English and Math

These measures of success track students who begin their college career placed in a remedial English or math class and go on to pass a transfer-level class in the same discipline. In other words, these students move from remediation to success in credit-earning classes. Using *t*-tests and correlation analysis, we find that the mean remedial English and math success are not

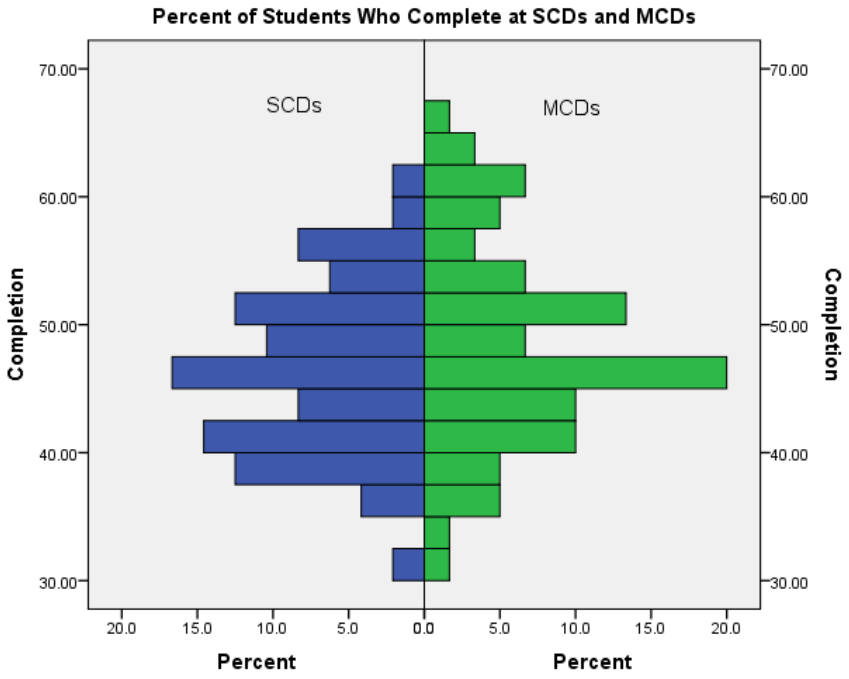

Figure 20. District type and percent of students who complete a transfer, degree, or certificate.

significantly associated with district type (see Figures 21 and 22). However, based on the *F*-test, the variance for remedial English success does differ significantly for district type (p = .017*). More specifically, 10% of MCD colleges have remedial English success rates of 60% or higher while no SCD college surpasses this threshold. Only 25% of SCD institutions achieve a remedial English success rate of at least 50% whereas almost 40% of MCD colleges surpass this threshold. Math success clusters between 25% and 45% for both SCDs and MCDs, which suggests California community colleges in both SCDs and MCDs continue to struggle with successfully addressing the issue of remedial math.

Improving the rates of student success among remedial students is a major focus of community colleges nationwide. MCDs potentially have greater student support services due to their ability to "share" administrative costs over among colleges. It is also possible that the

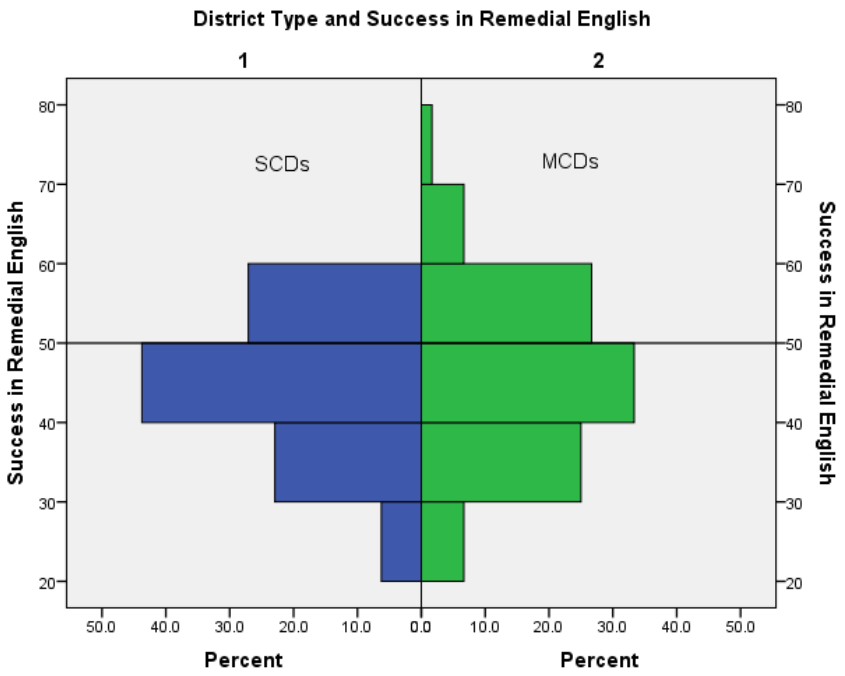

Figure 21. District type and percent of students who succeed in a transfer-level English class after beginning in remedial English.

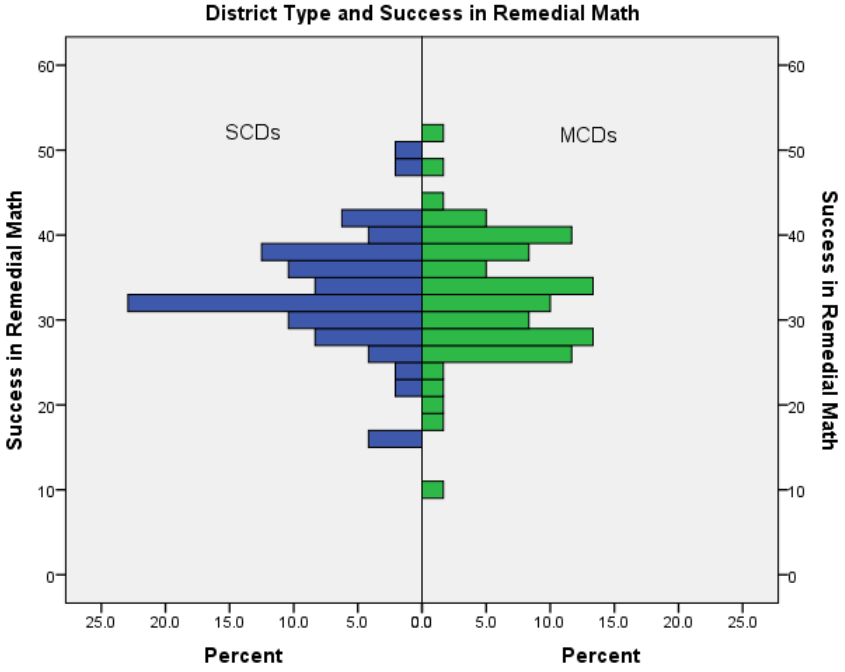

Figure 22. District type and percent of students who succeed in a transfer-level math class after beginning in remedial math.

competition for funds among the colleges in MCDs creates opportunities for administrators to see what strategies are most effective.

The Relationship Between Student Success and District Structure: Results From Regression Analyses

In addition to descriptive statistics, correlation matrices, *t*-tests, and *F*-tests, regression analysis allows for a more detailed picture of how the input and target variables interact with each other. Because regression works best when collinear variables are identified, I first created a linear model in SPSS with all of the numerical input variables for each target variable. SPSS automatically examined each possible subset of input variables to see which resulting model had the best results. The results of these tests (see Tables 12-17) show the degree to which each of the input variables is associated with the target variable (dependent variable). There were sometimes several variables that were collinear among the variables that had significant predictive value. For example, there is a strong association between percent of students receiving Pell Grants and the percent of traditionally underrepresented minority students (r = .334, p = .000***). Using both of these as input variables made it more difficult to see the true predictive effects of each one. While noting this collinearity in my results, I removed collinear variables with lower predictive scores to get a cleaner association between the input and target variables. Not surprisingly, all of the student success measures were highly associated with each other, as can be seen in the correlation Table 10. For example, student persistence is significantly correlated with all four of the other success measures: at least 30 units (r = .688, p = .000***); completion (r = .528, p = .000***); remedial English success (r = .566, p = .000***); remedial math success (r = .364, p = .000***). Due to the collinearity, each of the student success measures had to be analyzed separately.

Stepwise Regression for Target Variables

Target variable: Persistence. Persistence is measured as a percent (0-100). Persisting for the first 3 semesters is positively associated with size of the college as measured in FTESs (ß = 0.577, $p < 0.001$***) with the unstandardized regression coefficient of 0.001. This means that for every 1000 increase in FTES, we see a 1% increase in persistence. Persistence is also positively associated with the percent of full-time faculty (ß = 0.288, $p < 0.001$***) with the unstandardized regression coefficient of 0.279. This means that for every 1% increase in the percent of full-time faculty, we see a 0.279% increase in persistence. (See Table 12.)

Persistence is negatively associated with the percent of students who receive BOG waivers (ß = -0.197, $p < 0.01$**) with the unstandardized regression coefficient of -0.1. This means that for every 1% increase in the percent of students who receive BOG waivers, we see a 0.1% decrease in persistence. Persistence is not significantly associated with district type.

Table 12

Regression Analysis for the Dependent Variable of Persistence

Coefficients[a]

		Unstandardized coefficients		Standardized coefficient		
Model		B	Std. error	Beta	*t*	Sig.
1	(Constant)	48.322	4.084		11.832	.000
	Size in FTES	.001	.000	.577	8.343	.000
	Percent of full-time faculty	.279	.068	.288	4.104	.000
	Percent of students on BOG waiver	-.100	.035	-.197	-2.839	.005
	SCD or MCD	1.700	.905	.132	1.880	.063

[a]Dependent variable: Persistence

Success in achieving at least 30 units measures the percent (0-100) of students who obtain 30 units during a 6-year period. Student success in achieving at least 30 units is negatively associated with the percent of students on BOG waivers (ß = -0.562, $p < 0.001$***) with the unstandardized regression coefficient of -0.257. This means that for every 1% increase in the percent of students who receive BOG waivers, we see a 0.257% decrease in achieving at least 30 units. Student success in achieving at least 30 units is positively associated with the size of the college in FTES (ß = 0.393, $p < 0.001$***). Student success in achieving at least 30 units is positively associated with the percent of full-time students enrolled at each institution (ß = 0.314, $p < 0.001$***). Full-time students are taking more classes per semester, so it follows that institutions with a denser concentration of full-time students tend to have higher percentages of students meeting this benchmark when compared to other institutions that have a greater proportion of students enrolled part-time. The proportion of students on BOG waivers represents a proxy for the average socioeconomic status of students enrolled at each campus, which often can itself be a proxy for academic readiness of a student. Individuals from lower-income households may have spent more time working to support themselves and/or their families before coming to college and thus have had less time to devote to academics--and the same phenomenon may be occurring during college as well.

The district type is significantly associated with completion of at least 30 units, in which colleges in MCDs have a 3.311% greater rate of success. When we look at colleges with greater than 70% completion, colleges are twice as likely to be in MCDs as they are in SCDs. When we look at colleges in the less than 60% completion range, colleges are twice as likely to be in SCDs as they are in MCDs. (See Table 13.)

Table 13

Regression Analysis Predicting Completion of at Least 30 Units

Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficient		
		B	Std. error	Beta	*t*	Sig.
1	(Constant)	58.443	2.323		25.157	.000
	Size in FTES	.000	.000	.393	5.860	.000
	Percent of students on BOG waiver	-.257	.031	-.562	-8.268	.000
	Percent of fill-time students	.243	.055	.314	4.439	.000
	SCD or MCD	3.311	.800	.286	4.142	.000

[a]Dependent variable: At least 30 units

Target variable: Completion. Completion success measures the percent (0-100) of students who transfer or receive a degree or certificate. Completion is negatively associated with the percent of students on BOG waivers (ß = -0.625, $p < 0.001$***) with the unstandardized regression coefficient of -0.369. This means that for every 1% increase in the percent of students who receive BOG waivers, we see a 0.369% decrease in completion. Completion is positively associated with the percent of "traditional" students, who are under 25 and full time students (ß = 0.387, $p < 0.001$***) with the unstandardized regression coefficient of 0.396. This means that for every 1% increase in the percent of traditional students, we see a 0.396% increase in completion. Urbanicity, with higher scores representing institutions in more urban locations, is correlated with size of the college and district size and also has a positive association with completion (ß = 0.227, $p < 0.01$**). So we see that institutions with more traditional student populations and those operating in more urban settings tend to have higher rates of completion.

Urbanicity was also significantly associated with district type. District type is also a significant predictor of completion success with MCDs having a higher rate of completion (ß = 0.210, $p <$ 0.01**) with MCDs having a 3.153% higher rate of completion than SCDs in this regression model. (See Table 14.)

Table 14

Regression Analysis for the Target Variable of Completion

Coefficients[a]

		Unstandardized coefficients		Standardized coefficient		
Model		B	Std. error	Beta	*t*	Sig.
1	(Constant)	41.776	2.884		14.485	.000
	Percent of students on BOG waiver	-.369	.040	-.625	-9.333	.000
	Percent of students who are full-time and under 25	.396	.069	.387	5.708	.000
	Urbanicity	.596	.188	.227	3.162	.002
	SCD or MCD	3.153	1.090	.210	2.892	.005

Dependent variable: Completion
(β = -0.476, p<0.001***)

Target variable: Success in a college-level, transferable class in English after being placed in remedial English. Student success in remedial English is measured by the percentage of students (0-100) initially placed into remedial English who later earned a C or better in a college-level, transferrable English course. The percentages of students receiving BOG waivers is negatively associated with success in remedial English (ß = -0.476, $p <$ 0.001***) with the unstandardized regression coefficient of -0.356. This means that for every 1% increase in the percent of students who receive BOG waivers, we see a 0.356% decrease in student success in

remedial English. The percent of Black and Hispanic students is negatively associated with success in remedial English ß = -0.238, $p < 0.01$**). The percent of students under 25 (ß = 0.325, $p < 0.001$***), and the size in FTES (ß = 0.253, $p < 0.001$***) correlate positively with success in remedial English. Corroborating other research (Greene, Marti, & McClenney, 2008), the results indicate that as the average SES of the student body on a campus increases, the proportion of students achieving the particular benchmark for a given outcome also increases. Lower-income students may be commuting farther to campus, working more hours to support themselves and/or their families leaving less time to focus on academics, and may have arrived at college needing greater academic support than their more affluent peers in order to successfully matriculate into and through college-level courses. Larger schools, those that employ greater proportions of faculty in full-time appointments, and institutions with denser concentrations of more traditionally-aged students tend to report higher success rates for students moving out of remedial English courses and subsequently passing a college-level course in the same subject. This model shows that district type is significantly associated with remedial English success, with colleges in MCDs having a 3.679% higher rate of success. (See Table 15.)

Target variable: Success in a college-level, transferable class in math after placement in remedial math. Student success in remedial math is measured by the percentage of students (0-100) initially placed into remedial math who later earned a C or better in a college-level, transferrable math course. Success in remedial math, like each of the other target variables, is negatively associated with the percent of students receiving BOG waivers (ß = -0.510, $p < 0.001$***). This finding mirrors research on math readiness and success done elsewhere (Long, Iatarola, & Conger, 2008). The only other variable associated with success in math is the proportion of traditionally-aged students at the college (ß = 0.339, $p < 0.001$***).

Table 15

Regression Analysis for Remedial English Success

Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficient		
		B	Std. error	Beta	*t*	Sig.
1	(Constant)	34.586	3.988		8.672	.000
	Percent of students on BOG waiver	-.356	.054	-.476	-6.644	.000
	Percent of students under 25	.298	.064	.325	4.633	.000
	Percent Hispanic and Black students	-.133	.040	-.238	-3.345	.001
	Size of college in FTES	.000	.000	.253	3.602	.000
	SCD or MCD	3.679	1.231	.194	2.988	.004

[a]Dependent variable: Remedial English success

Considering that math is often a cumulative discipline, it makes sense that younger students, who might recall their high school math classes, succeed at higher rates; thus, institutions that attract traditional-aged students in greater numbers tend to see better success rates of students who successfully move from remedial math and subsequently pass a college-level math course. (See Table 16.)

Target variable: Graduation rate for first time, full time students within 150% normal time (3 years). Graduation rate (measured in percent, 0-100) for first-time, full-time students within 150% of normal time is negatively associated with the percent of Black and Hispanic students, and this finding extends previous research suggesting lower graduation rates among Black and Hispanic students (ß = -0.491, $p<0.001$***). Lower graduation success by

Table 16

Regression Analysis for the Target Variable of Remedial Math Success

Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficient		
		B	Std. error	Beta	*t*	Sig.
1	(Constant)	28.709	3.596		7.984	.000
	Percent of students on BOG waiver	-.279	.044	-.510	-6.327	.000
	Percent of students under 25	.227	.053	.339	4.257	.000
	SCD or MCD	.525	1.115	.038	.471	.639

[a]Dependent variable: Remedial math success

minority students is well supported by existing research (Calcagno et al., 2008; Kuh, 2008; Venezia & Kirst, 2005). The graduation rate is positively associated with the percent of students under 25 (ß = 0.257, p<0.01**) and not statistically related to district structure. (See Table 17.)

Table 17

Regression Analysis for the Target Variable of Graduation Rate

Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficient		
		B	Std. error	Beta	*t*	Sig.
1	(Constant)	24.150	3.369		7.168	.000
	Percent under 25	.159	.051	.257	3.120	.002
	Average Percent Black and Hispanic students	-.185	.031	-.491	-5.926	.000
	SCD or MCD	-.409	1.060	-.032	-.386	.700

[a]Dependent variable: Average grad rate 150% time FT and first try

Challenges in Assembling the Dataset

In gathering data for this project, some variables were straightforward to acquire, while other variables presented unexpected challenges. The primary problems lay in the lack of consistency in the list of colleges among the cohorts, possible inaccuracies in the data reported by institutions, missing data, and the complexity that the district/college structure creates in creating a sensible model.

State-Level Reporting in DataMart and Federal-Level Reporting in IPEDS

Comparing data from the state (DataMart) and federal (IPEDS) databases presented a few interesting problems. First, the names of several colleges differ in the two databases. In one, a college might be listed as College of Marin, in the other, just Marin or Marin College. This is easily correctable, but the issue introduced an added layer of auditing to ensure data from the same institutions were being pulled from both systems.

Changing College Status and Name

During the years studied, the status of several colleges changed. In creating the list of colleges for the five cohorts, I excluded any college that did not appear for each of the 5 cohorts. This resulted in analysis of 108 colleges out of the current 113. For example, during the five cohorts being analyzed, Compton College, part of a single college district, failed to maintain its accreditation and became a center as part of the El Camino district. The numbers for Compton are missing for several years, thus Compton was excluded from the list. West Hills Lemoore, Woodland, Norco, and Moreno Valley also were not included as they did not have data for every cohort. Consistency over the five-cohort period was more important than complete college lists so that when I later compared the cohorts, they were identical.

Challenge Related to Integrating Variables in a 6-Year Cohort Model and Variables Measured Yearly

I averaged student success measures across five cohorts to simplify the analyses and the presentation of data. For variables not tied to a specific cohort, I took the measure for the first year of each cohort and then averaged that over the five cohorts. While this approach simplified the analyses and reporting of results, it may mask some important nuances and relationships in the data that could be attributed to current events or policy changes occurring across time. I have tried to capture some of this nuance in the discussion of the target success variables over time (see Figures 23-27).

Challenges Related to the California Economy and the Years Studied

The five cohorts whose data is contained in this research began in years 2006, 2007, 2008, 2009, and 2010. These years contained The Great Recession, which impacted employment, enrollment, and funding from the state. Thus, this study includes a contextual effect that is difficult to operationalize or quantify, as the results of the study may have been affected by the increased enrollments at community colleges during the recession while these same institutions attempted to serve the needs of more students with fewer financial resources coming from the state (Colleges brace for jumps in enrollment, 2009; Recession after-effects, 2015; Hoover, 2011).

To find trends in student success as they relate to district structure, the cohort data was averaged and analyzed. Averaging the cohort data masks the changes that occurred over the years for the target variables. In addition to the averaged data shown, I also studied each cohort separately to see if the averaging changed the overall conclusions. It did not.

I have included the following graphs (see Figures 23-27) to show how the five target variables changed. Over the years studied, all measures of success trended up except for the

most important measure of success, overall completion, although this measure seems to be going up for the last few years studied. Notably, the success measures included in the study represent leading indicators of success. For example, as greater proportions of students matriculate from remedial to college-level math and English, we would expect to see increases in persistence and completion of 30 units in the years that follow. Similarly, as persistence rates rise, the graduation rates in later years should also begin to increase.

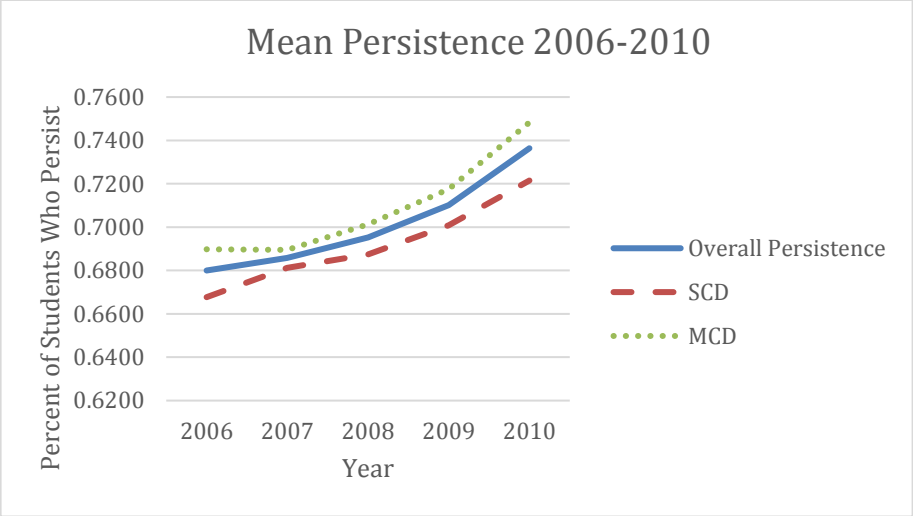

Figure 23. Mean persistence.

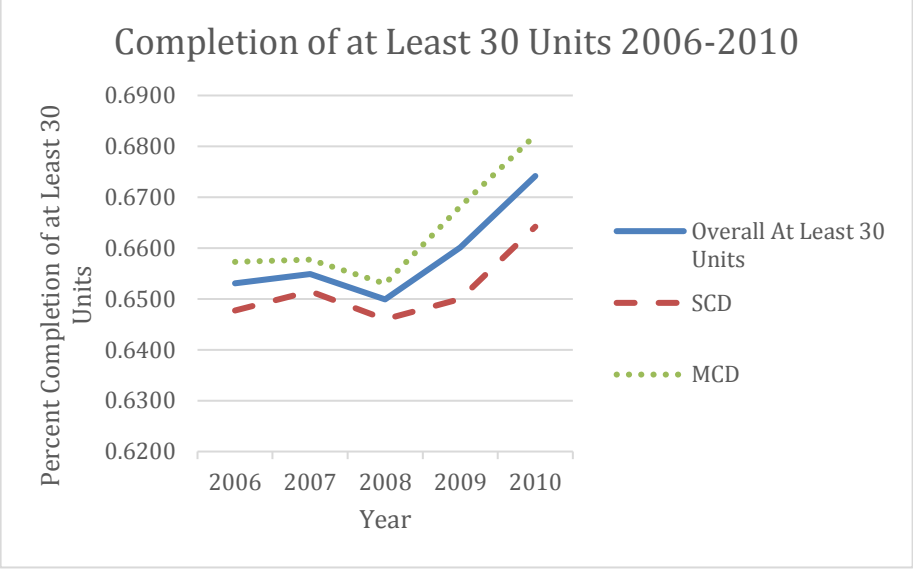

Figure 24. Completion of at least 30 units.

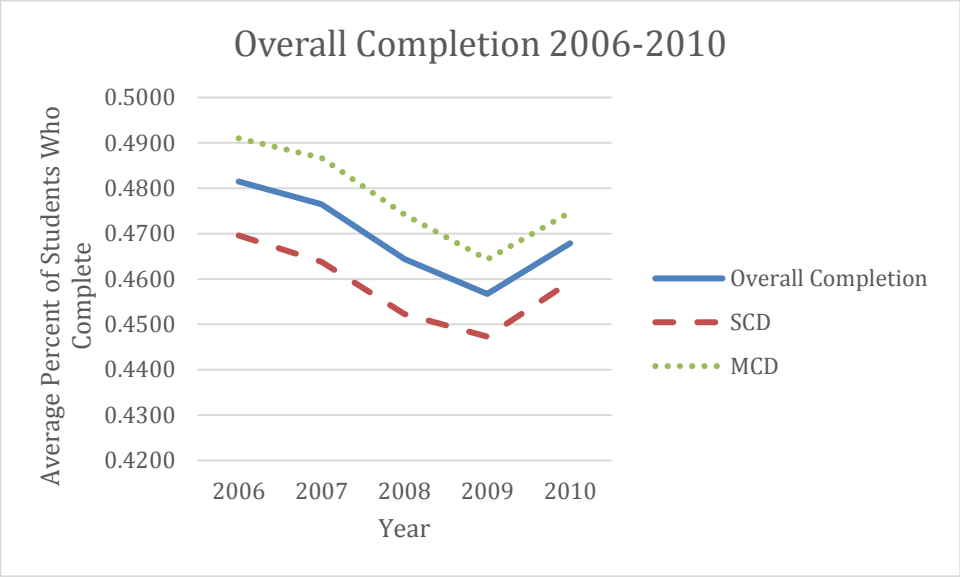

Figure 25. Overall completion.

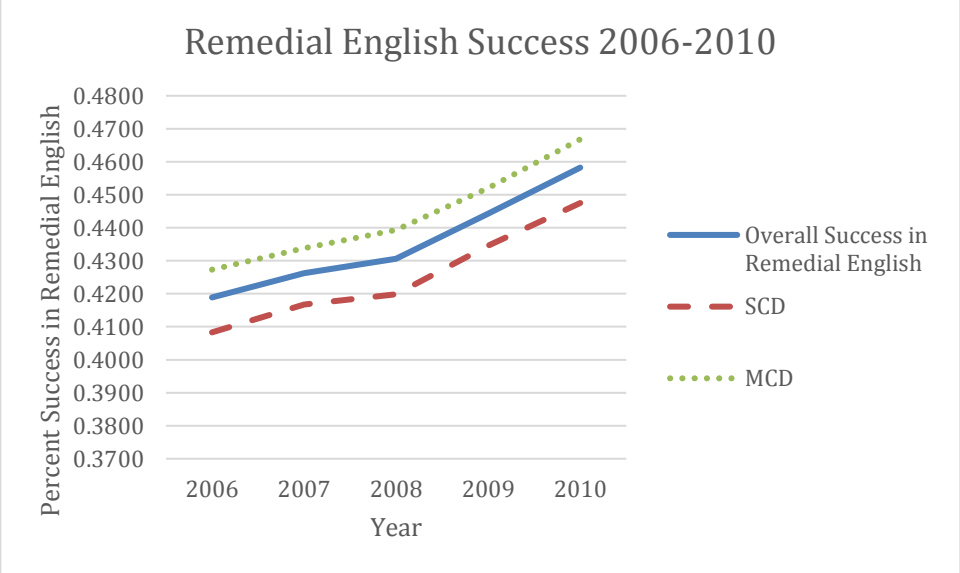

Figure 26. Remedial English success.

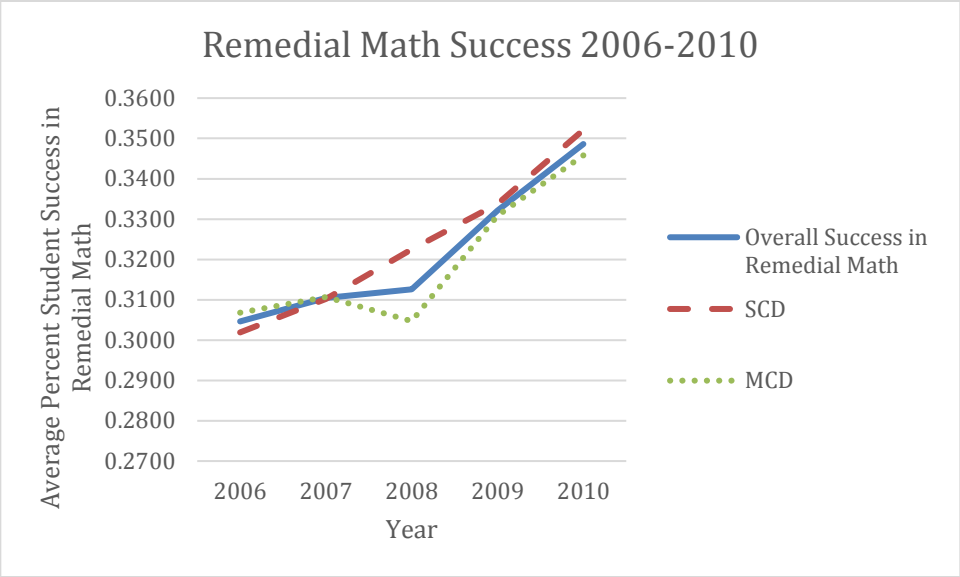

Figure 27. Remedial math success.

The Problem of How to Group Such Disparate Colleges and Districts

When counting the percent of money spent on instruction, at a college, the numbers from a single and multi-college district cannot easily be compared. For a single college district, the human resources department, top administrator salaries, and other district resources will be included. For a college in a multi-college district, however, the amount of money spent on instruction at the college might not include the administrative functions that the district takes care of for the college. This could result in SCDs having lower rates of spending on instruction or student services than colleges in multi-college districts where the college budget does not include the percent of district budget spent on administration.

There are some data points reported only by college or only by district. If we look at IPEDS, the federal database, the reporting for district-level expenses seems haphazard. Some multi-college districts list their district office as an administrative site, while others do not. Pulling out how much is spent at the district office in relation to the colleges in a multi-college district cannot be done in IPEDS with any degree of certainty given the variation with respect to

how multi-college districts choose to identify or describe their district structure and administrative organization. The need to reconcile this is important if we are to compare total expenditures on administrators for both a college and district office.

Percent Spent on Instruction

As of 1961, California law has required each community college district to allocate no less than 50% of its general fund expenditures to "salaries of classroom instructors," under a formula based upon the current expense of education. When we examine the 311 reports from the CCCCO Fiscal Data Abstract pages, we can take the number reported that complies with the 50% rule. The report data for each district clusters around 50% for all colleges analyzed. When, however, we more broadly calculate the percentage of expenses spent on instruction by dividing instructional expenses listed by the total expenditures, the resulting percentages differ. This is most likely due to the time of year adjustments. I used my calculations, not those reported by the colleges, so that the derived variable was calculated in the same manner for all institutions and for all years represented in the study.

Percent of Full-time Faculty

A full-time faculty member is generally required to teach 15 units per semester. When looking at the full-time to part-time ratio, knowing the number of full-time and part-time faculty is insufficient. Part-time faculty might teach just one class or they might teach the maximum number of classes at a campus (often 10 units). Instead, it is necessary to know the full-time equivalent faculty (FTEF) counts. This information is not easily derived and can be found on the CCCCO website in a report for 2016, but not in a database. Furthermore, the chancellor's office does not archive previous reports on its website. By changing the year in the URL, I managed to locate this data.

AB 1725 from 1988 required that colleges work toward 75% of classes taught by full-time faculty. I used the data reported to the CCCCO for the calculations in this research. This data counts "overload" classes taught by full-time faculty as classes taught by part-time faculty.

Conclusion

This chapter's descriptive statistics, correlation tables, *t*-tests, *F*-tests, and regression analysis describe the complex interplay among input and target variables related to student success. Size of a college as measured in FTES is associated with success. Percent of traditionally underrepresented minority students is associated with lower rates of success. Small colleges with fewer than 5000 FTES have lower success rates on average when they are located in SCDs and higher success rates on average when they are located in MCDs.

Chapter Five: Discussion of Findings

Overview of Principal Findings

This study sought to understand the extent to which measures of student success in California's community colleges are associated with the district structures of those colleges, enrollment and employment demographics within the institutions, and how those institutions use their financial resources. Of particular interest was the extent to which community colleges located within SCDs differ from their counterparts operating in MCDs on measures related to student enrollment characteristics, faculty employment characteristics, expenditures, and student success rates. The study relied primarily upon inferential statistical analyses that control for several measures related to the characteristics of students enrolled at these institutions (e.g., percent of "traditional" students, the percent of students receiving BOG fee waivers or Pell Grants, racial/ethnic composition of students). In addition to assessing whether district structure is associated with student outcome measures, other campus-level variables were tested for association with student success, including the percent of district funds spent on instruction, the percent of full-time faculty, and faculty-to-administrator ratio. Ultimately, the study aimed to identify the extent to which the organizational structure of California community college districts significantly related to student demographics, student success rates, and the ways in which these institutions operate efficiently as measured by proportion of expenditures spent on instruction, employment of full-time faculty, and the ratio of faculty to administrators.

Findings Related to District Type and Student Success

The structure of the districts in which community colleges operate represents a significant factor in explaining variation in three of the six student success measures examined in this study: the proportion of students who earn at least 30 credits; the proportion of students classified as

completers; and the proportion of students who place into remedial English and subsequently pass a college-level English course. Whether an institution operated within a single- or multi-college district did not significantly relate to the proportion of students who persist into the third term after initial enrollment, the proportion of students successfully matriculating out of remedial math, or graduation rates.

Several other variables emerged as having a statistically significant association with district type (district size, faculty-to-administrator ratio, percent of students receiving Pell Grants, and percent of full-time students). When controlling for these variables, district type did not have a significant association with student success measures. In the regression model, the district type was strongly associated with completion, success in English after initial placement in remedial English, and completion of at least 30 units.

This study attempted to uncover direct associations between district type and student success, in an effort to test the hypothesis that MCDs' added layer of bureaucracy could negatively relate to student success. This analysis did not identify such a direct association. Further, analyses suggested that categorizing California's community colleges into one of two types--SCD or MCD--likely understates the actual complexity of these institutions, their districts, and the state system that governs them. Many large SCDs are organized similarly to MCDs and have multiple large campuses that operate with great autonomy. Instead, a more complex web of associations between several other institutional characteristics (e.g., size, proportion of students receiving Pell grants) and measures of student success emerged. These findings indicated that, while district type is not directly associated with student success, larger colleges tend to have greater student success.

The size of a district is strongly positively associated with several variables: (a) the size of the college as measured by FTES; (b) faculty-to-administrator ratios; (c) percent spent on instruction; (d) percent full-time faculty; (e) persistence; (f) completion of at least 30 units; (g) remedial English success; (h) percent of students receiving Pell Grants; (i) percent of students who are Black or Hispanic; and (j) percent of students who are under 25. Since district type is associated with district size, and district size is, in turn, strongly associated with student success, it follows that district type is indirectly associated with student success.

The analyses show that small colleges (those with fewer than 5,000 FTES) have the lowest rates of student success on a selected set of outcomes. This is particularly true of small colleges in SCDs (based on descriptive statistics). Further inquiry into the structure and funding of this subset of colleges is warranted to better understand why their students are less successful than those at larger institutions and like-sized institutions that are housed within MCDs.

Findings Related to Campus-Level Variables and Student Success

Several campus-level variables were significantly associated with student success. The percent of funds spent on instruction is significantly associated with persistence, completion of at least 30 units, and success in English after initial placement in remedial English. Campuses that maintained a heavier reliance on full-time faculty (as measured by the proportion of faculty appointments classified as full-time) tended to have higher rates of persistence and completion of at least 30 units. While faculty-to-administrator ratio is not significantly associated with student success, it is significantly positively correlated to college size in FTES, which in turn is significantly associated with success. That is, larger colleges have more faculty supervised by each administrator. Further study of the indirect relationship is warranted.

The analysis also revealed a consistent and negative relationship between student success measures and the percent of students at an institution that receive BOG waivers or Pell Grants, a finding that is consistent with previous studies showing negative relationships between student outcomes and average socioeconomic status of schools or colleges where students attend (Calcagno et al., 2008; Kuh, 2008; Titus, 2004).

Theoretical Framework

This study used Mintzberg's organizational structures as a theoretical framework, assuming that SCDs could be categorized as machine bureaucracies, and MCDs could be viewed as divisionalized bureaucracies. What became clear, however, is that California CCs, particularly California SCDs, have a range of structures, and thus did not necessarily fit neatly into these two categories. If all SCDs were organized such that they had a single campus, with all administrative functions centered at that campus, then Mintzberg's model might have provided a greater insight, and furthered a general understanding CCCs' potential organizational challenges and strengths. For example, machine bureaucracies, like all organizations, must strike a balance between central and divisional functions. Full-time faculty, the equivalent of professional experts from Mintzberg's model, might chafe at policies that intrude too greatly into their classrooms. Administrators tasked with planning and budgeting for the construction of new campus buildings might similarly find faculty input impractical and unhelpful. Mintzberg argues an organization must strike the appropriate balance between the "push" to centralize and the "pull" to de-centralize administrative functions.

But it proved difficult to apply a binary framework based on Mintzberg's organizational structures. Consider, for example, a large SCD like San Francisco City College, which serves 60,000 students across 11 campuses. Each of these campuses is led by a dean, rather than a

president. Each of these deans report, in turn, to an assistant vice-chancellor who reports to the chancellor. Applying Mintzberg's terminology, this so-called SCD functions more as a divisionalized bureaucracy with a highly centralized district center, and with each campus acting as a semi-autonomous unit. The campus deans lack authority to make individualized decisions about the vision and direction of their campuses; the SCD chancellor is responsible for such determinations.

San Francisco City College's centralization of control has had some interesting consequences on students, faculty voice, and the reporting of data. Students from any campus may compete in college sports, for example, but only one campus has the sports fields and equipment. I would conjecture that this decision to centralize sports at a single campus affects the "school spirit" experienced by students at one of the other six campus centers. Students from these "non-sports" campuses may not even be aware of how "our team" is doing. Further, a community college of 60,000 gets just one team for each sport. If there were 11 colleges, there would potentially be that many more teams and opportunities for students to participate in athletics.

The impact of district structure on student athletics is minor, however, when compared to the impact this structure can potentially have on faculty representation in campus-level and district-level decisions. City College of San Francisco has one academic senate president. If it were an MCD with 11 colleges, there would be senate presidents at each campus and possibly a district-level council as well. Having many senate presidents might have the effect of diluting the voice of faculty or of it might result in greater faculty participation.

Perhaps the most important impact of the decision to be a SCD or MCD has to do with reporting student success data. When CCSF reports their student success numbers to DataMart

or IPEDS, students from every campus are grouped as CCSF students. Any district can disaggregate data by campus and see how students fare at one location versus another. While districts can do this for internal review, they are not required to publish this data on state or federal databases. Data that is grouped for SCDs with many campuses lacks the transparency of data that is published for each college in an MCD.

Summary and Interpretations

Size of the College as a Factor in Student Success

This study concludes that the size of a community college, as measured in FTES, is strongly positively associated with student success measures. Students at larger community colleges are more successful than those who attend smaller community colleges This finding is contrary to Calcagno et al. (2008), who concluded that students experience greater intimacy and connection at smaller 4-year colleges, but is consistent with Titus (2004), who concluded students benefit from the greater resources of larger 4-year colleges. These researchers were, of course, evaluating 4-year colleges, and their findings may not be applicable to community colleges. For example, Calcagno et al. (2008) found that living on campus helps students better integrate into the college learning experience; such a factor is irrelevant to a CC student's experience.

When I embarked on this research project, I shared Calcagno's idea that smaller colleges might create greater connection and better support student success. However, my results suggest that exactly the opposite may be true for California community college students. This result may be due, in part, to the very nature of community colleges. Students enroll in a community college in order to attend school, but have little connection to the campus outside of class. Thus, a smaller and more intimate campus may not provide a community college student with the same

benefits with respect to academic outcomes as it does the 4-year college student. Indeed, MCDs appear clearly to benefit financially from the centralization of functions such as human resources, technology support, purchasing, online education help, and student registration, thereby allowing more money to be spent on instruction. This seems particularly true for smaller colleges.

This study suggests, moreover, that smaller CCCs may not necessarily provide students with a more intimate or connected educational experience. Smaller community colleges often have less representation of faculty employed in full-time appointments, higher numbers of administrators per faculty member, and fewer resources. Larger colleges, due to their ability to scale services, may provide students with greater access to tutoring, technology, and guidance.

Significantly, this study was unable to control for the fact that many students attend multiple community colleges throughout their educational journeys, as well as during the same terms. Because this study aggregated all student data from a single institution, it was not possible to explore individualized factors that may contribute to a student's success. It is possible that future evaluation at the unit-record level would show that an institution's size carries less weight for academic success than this study suggests, and further investigation of individualized records is warranted.

The effect of a community college's size on student success has not been adequately examined in the CCCs and deserves further consideration and evaluation. Why might larger schools have more successful students? Do larger schools attract better teachers, better technology, more or better services, or perhaps greater esprit de corps? Are they better able to leverage limited resources and to negotiate better contracts with instructors? In thinking through possible answers to these questions, it is important to remember, as Birnbaum (1989) pointed

out, institutions of higher education are ultimately paradoxical. Birnbaum's caution that American institutions of higher education are simultaneously poorly managed and very successful suggests that the researcher should avoid jumping to quickly to causal conclusions.

Percent of Students on BOG Waiver

As other researchers have found, the percent of an institution's students who come from lower socioeconomic backgrounds is negatively associated with the institution's student success rates (Venezia & Kirst, 2005). This study bears out this conclusion, although a student's SES was a weaker predictor of student success compared to campus size measured in FTES. That institutional size is more closely linked to student success rates at California's community colleges than socioeconomic background was surprising, as earlier studies have placed greater emphasis on demographic characteristics of students (Venezia & Kirst, 2005). Part of this discrepancy may result from different analytical approaches, as this study relied upon institution-level data and most previous research has used student-level data with supplemental contextual variables at the institutional level.

Nevertheless, this study's findings suggest that it may be appropriate to more closely scrutinize the generally accepted view that SES is the principal factor in determining a student's success. At the time of this writing, California Governor Jerry Brown has suggested a transition to a student-centered funding formula, pursuant to which institutions would receive additional funding and support for low-income students (CCCCO, 2018). Such additional funding may well help mitigate lower success rates of schools that have more low-income students. However, the governor would do well to also consider how best to assist problems unique to the smaller community colleges, which have poor student success outcomes. Such efforts might include a

non-linear funding methodology that would provide greater proportional assistance to smaller schools.

Campus Structure and the Complexity of Classification

My effort to understand the difference between SCDs and MCDs revealed that these labels are used somewhat arbitrarily, suggesting that the binary classification of districts as either SCD or MCD is inadequate for describing the various district structures. For example, a campus might have thousands of students, a dedicated registration area, library, cafeteria, and counseling center, and so on, but may nevertheless be designated by district officials as a "second" campus or center, or as a "satellite" site. In another district, by contrast, a "secondary" location might entail a college's evening use of an empty high school for classes, where students have no access to any centralized functions, such as a registration area or counseling center. While these two types of campuses might have very similar names, a student's experience would obviously be very different, depending on which type of campus they attended. Requiring that districts report student success rates for each campus would allow students the chance to evaluate which location best fits their needs.

The somewhat arbitrary use of "MCD" and "SCD" designations may result from the way in which California allocates funds to community colleges. State funding depends, in part, on whether an institution is designated as an MCD or SCD, and it is in a district's interests to weigh which type of organizational structure results in the greatest state contribution. Currently, a district may choose to open a second location as an off-site campus or center, and, under the base funding allocation model, these terms have monetary consequences. Thus, an off-site campus or center that is, for practical purposes, indistinguishable from a separate "college," might nevertheless be deemed an SCD "center" for funding purposes. This arbitrary approach to

nomenclature thus complicated my analysis, as the state's databases do not have separate categories for an SCD with multiple "campuses," each with thousands of students, and a SCD with a single college at one location. Before the massive expansion of the community college system in the second half of the 20th century, such a distinction would have been unnecessary; colleges were generally accepted to exist on a single campus even if they offered a few classes "off campus." Given that state funding is tied to district type, consistent application of the terms used to describe various district structures would facilitate investigation of organizational efficiency and student success measures. If all districts were required to report data for each physical location, the structural designation would no longer mask the differences in student success at different campuses.

Ultimately, it is possible that this study's research questions reveal less about whether MCDs or SCDs have higher student success rates, and more about how this binary system of nomenclature itself masks tremendous differences among the California SCDs, to the extent that it is not possible meaningfully to draw general conclusions about SCDs. Specifically, relying on the CCCCO definitions of district type, the study concludes that institutional structure is not associated with student success until we account for some of the important differences in enrollment and employment characteristics of institutions operating in SCDs and MCDs For example, is Cuesta College, a so-called SCD with two equally-sized separate campuses located in different parts of San Luis Obispo County, an institution that actually fits within Mintzberg's machine bureaucracy model? Or is it more fairly considered a divisionalized organization? Similarly, does the San Francisco Community College, with 11 campuses in different parts of the city, with a single chancellor and campus "deans" a genuine SCD? How should we fairly describe a system where thousands of students attend classes in a single

geographic location? How, indeed, should we define the terms college, campus, and center? These seemingly simple questions are confusing enough so that many of those who report data to IPEDS on behalf of their districts could not clearly say what structural category they belonged to. Or, perhaps the federal system of reporting is not flexible enough to accurately capture the nuances of how California's community colleges are organized/governed.

The problem with accurate nomenclature is not just academic. Part of the reason we have a transparent reporting system for student success is so students and faculty know what their rates of success are at their specific campus. When a campus center shares its data with 10 other campus and this is called their college success, what does this mask?

Perhaps it is better to harken back to the term campus when creating a taxonomy for the CCC system. Campus is understood as a designated place where classes meet. Many of the CCCs that are listed as a SCD have more than one campus. And when these campuses grow large enough, it is hard to argue that they are greatly different from a separate college. Using the word campus instead of college could clear up some of the confusion in sorting the CCCs. A Single *Campus* District and Multi *Campus* District would properly place in the same category the large systems of Los Angeles and San Francisco by stating that both have multiple campuses that are in play, while not all of those campuses are called colleges in either of the systems. This distinction would make the question of MCD versus SCD more meaningful because we could focus on how structural decisions impact faculty representation and student success. Of course, SFCC would still get reported as a single institution unless the charters and bylaws get rewritten such that campus and institution mean the same thing in terms of governances, structure, accountability reporting, et cetera. With a clearer nomenclature, efficiency could be better measured to see what organizational structures most benefit student success.

Percent of Funds Spent on Instruction Impacts Student Success

Funds spent on instruction are associated with greater persistence, completion of 30 units, and success in English after initial placement in remedial English. This confirms what common sense would suggest: money spent teaching students helps those students. This should further encourage districts to work on greater efficiency with necessary bureaucratic work to funnel greater funds towards student instruction. Mintzberg's research on organizations would suggest that the goals of the administration and the faculty, the central control and the professional experts, necessarily conflict at times. With this in mind, both sides must work together to send as much money to student instruction as possible.

The state requirement that colleges spend 50% of funds on instruction checks the impulse to spend excessively on other things. This study found that spending clustered around the 50% mark for many colleges. This should be looked at in greater depth to see if college are gaming the system in the way they report their numbers.

One of the key places funding can make an impact is with a greater percent of classes taught by full-time faculty. This research shows that the percent of full-time faculty is positively associated with persistence and completion of at least 30 units. Full-time faculty exert greater pressure on resources than part-time faculty, but their impact is significant.

Implications for Policy and Practice

There are three important implications of this research. The first implication is that if the size of a college is associated with greater success, it is important for state policy makers to investigate how this impacts funding and equity. The state funding model needs to be examined to see if a linear funding model based on enrollment makes sense when small colleges seem to be struggling most with student success.

The second implication of this study revolves around the terms college, campus, and center. At present, districts are classified as SCDs or MCDs. But when comparing these districts, it is clear that many SCDs have multiple campuses that operate very similarly to individual colleges. Requiring that data be reported by location would improve transparency for students deciding among campuses and allow researchers to compare like campuses more effectively, whether or not they are called colleges or centers. A new classification could be developed that used the terms single-campus college (SCC) and multi-campus college (MCC). The CCCCO uses these designations to determine funding for the various districts. Districts are funded for the total FTES within the district, but also for each college and center within the district, with each getting different apportionment based on its label and size. It is important for the sake of fairness that all stake-holders agree on definitions of educational entities, so that funding to the districts is equitable.

Finally, this research reasserts the need for funding structures to prioritize student instruction as these funds are associated with greater student success.

Implications for Theory

Mintzberg's model is most useful in looking at the interplay between central authority and de-centralized authority. He posits that professional experts, in this case the faculty, pull towards the decentralized authority while administrators pull towards greater central control. This push-pull is not only at work within individual districts, but also between the state chancellor's office and the districts.

The CCC system's organization is unlike any other institution of higher education in the world, as it has developed from conception to a system of 114 colleges in the past century. What was described as a messy expansion developed into a hybrid of the K-12 and university system

in California. The development of multi-college districts both in California and elsewhere in the United States was an innovation in the annals of higher education. Mintzberg's framework offers a template for colleges, districts, and the state system that can help them identify where each individual unit fits in the greater system. Also, this framework assists in predicting and avoiding the pitfalls that often accompany professional bureaucracies and machine bureaucracies. With the improvement in information technology that could allow individual districts, or indeed, the state of California to greater centralize almost any part of the system, it is especially important that we consider the research related to organizational theory. State initiatives like the Online Education Initiative (OEI) are already exerting greater state control by offering financial incentives for districts to adopt a common learning management system (LMS). This saves districts a great deal of money. It has also allowed students from CCs all over the state to take online classes at other colleges (without having to register at those other locations). The OEI might solve the immediate problem of a student unable to register in an online class at their campus, but it creates other potential issues. What college is this student actually attending? Which district should get funding if a student is using resources from their home college to attend a college in another part of the state. The issues with this sort of centralization of classes, if extended, could have a profound impact on the system.

Recommendations for Further Research

This study has three recommendations. First, further research is needed on the relationship between CCC size in FTES and student success. This research should address the advantages larger colleges have while considering student demographics and funding priorities. It would be interesting to find out what colleges of similar size and demographics, but different outcomes, are doing differently to discover what works best and can be tried elsewhere. Second,

as the designations of SCD and MCD seem inadequate for describing the complex CCC districts, a review of terminology for reporting purposes is in order. Students, researchers, and practitioners would benefit from greater clarity and transparency and could further explore how the different campus structures impact student success. Future research might also examine the operations within the smallest community colleges (those enrolling fewer than 5,000 FTES), especially those in SCDs, that account for the apparent inefficiency with respect to the greater variation in the proportion of expenditures allocated to instruction and the overall lower rates of student success.

Conclusion

CCCs have received substantial criticism concerning student outcomes, including low rates of program completion and transfer (Shulock & Moore, 2007). The complicated district structures that grew in a haphazard manner over the last century need to be reexamined in the light of organizational structure research and measures of student success. By carefully considering what district models increase student success, future leaders must take careful stock of the current set up and decide how best to serve students at one of the largest systems of higher education in the world.

As a teacher at a CCC and a passionate advocate for using research to increase student success, this research has helped me understand the complex system in which I work. I hope to use what I have learned to improve the system from within.

Appendix

Degree of Urbanziation IPEDS Data Recoded for Analysis

Variable Name	Value	Value Label	Re-Coded Large to Small
Degree of urbanization (Urban-centric locale) (HD2014)	11	City: Large	10
Degree of urbanization (Urban-centric locale) (HD2014)	12	City: Midsize	9
Degree of urbanization (Urban-centric locale) (HD2014)	13	City: Small	8
Degree of urbanization (Urban-centric locale) (HD2014)	21	Suburb: Large	7
Degree of urbanization (Urban-centric locale) (HD2014)	22	Suburb: Midsize	6
Degree of urbanization (Urban-centric locale) (HD2014)	23	Suburb: Small	5
Degree of urbanization (Urban-centric locale) (HD2014)	32	Town: Distant	4
Degree of urbanization (Urban-centric locale) (HD2014)	33	Town: Remote	3
Degree of urbanization (Urban-centric locale) (HD2014)	41	Rural: Fringe	2
Degree of urbanization (Urban-centric locale) (HD2014)	42	Rural: Distant	1

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