Development of and Adherence to Student Education Plans Among Students at a Small Community College

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Abstract

In response to low completion rates in the California Community College system, the 2012 Seymour Campbell Student Success Act requires districts or colleges to provide all degree- or transfer-seeking students with an opportunity to develop individual Student Educational Plans (SEPs). SEPs are guiding documents prepared in consultation with counselors to make course-taking patterns more efficient, reduce unnecessary coursework, and expedite completion of graduation requirements, transfer requirements, or both. Specifically, an SEP outlines a student's program of study and provides a roadmap of courses required for completion. The assumption is that SEPs will provide direction and focus to students, resulting in higher persistence and more efficient completion. However, students are not required to develop SEPs to enroll in courses, and the experience of choosing from the vast array of programs and courses available at community colleges has been described as "the equivalent of navigating a shapeless river on a dark night" (Scott-Clayton, 2011). Traditionally underserved and first-generation students may experience disproportionate challenges in navigating this complex decision-making environment.

This study uses quantitative methods to examine what differences exist among student groups who have developed SEPs with a counselor prior to their first enrollment, and whether they actually enroll in the courses outlined in their SEPs. The first two research questions address rates of SEP participation among first-time, degree and transfer seeking community college students across demographic/socioeconomic characteristics, academic variables, and participation in first-year student success/retention programs. The second two research questions examine SEP adherence across the same student characteristics. The final research question describes common patterns of SEP nonadherence.

The findings of this research show that some disparities in SEP participation and adherence among traditionally underserved groups remain, but efforts to address these gaps through retention/success programs with strong matriculation support appear to be succeeding for those who participate in them. In addition, examining common patterns of nonadherence, failure to enroll in first-year required English and Math courses accounts for a substantial proportion of nonadherence, potentially derailing students from their completion goals.

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Dedication

To my beloved brother André. You endured your battle just long enough to call me Dr. Shafer and I hope I did you proud. My heart is broken as I write this and I miss you so much already.

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Chapter One: Overview of the Study

Introduction

Low completion rates have been a persistent concern in U.S. community colleges; the most recent data available from the American Association of Community Colleges showed just 39.3% of first-time students starting out at 2-year institutions completed a 2- or 4-year program within 6 years (2017). Within the California Community College system, both completion rates and the timeliness of completion are of great concern, particularly among disadvantaged groups. More than half of students enrolling for the first time as college students and seeking to complete a degree, certificate, or transfer to a 4-year institution do not reach their educational goal within 6 years.

According to the Chancellor's Office Student Success Scorecard, the accountability measure mandated by state legislation during the time period covered by this study, this trend has remained consistent for the ten most recent cohorts of first-time students entering the system (Chancellor's Office, 2018). Among the cohort of students entering the CCC system in 2011-2012 (the most recent data available), the 6-year completion rate was 48%. The rate among economically disadvantaged students was 45%, compared to 59% of non-economically disadvantaged peers. Completion rates were also particularly low among Hispanic (42%) and African-American (37%) students compared to their White and Asian peers.

For those who do beat the odds and complete a credential, inefficiency is a costly concern. The Foundation for California Community Colleges (2017), in laying out the system's Vision for Success, stated that 60 percent of California undergraduates attend its community colleges, and that the average time to earn an associate degree is 5.2 years, considerably longer

than the expected two years. In addition, students completing 2-year associate degrees in 2017-18 finished with an average of 32 excess units that did not count toward their degree--equivalent to more than one year of full-time enrollment. At the same time, a 2014 Public Policy Institute of California (PPIC) report estimates the state's workforce faces a shortage of 1.5 million skilled workers with some college training by 2025. The report suggests that skills training provided by the CCC system is crucial to narrowing the gap, but the current completion rates and time to completion will not be nearly sufficient to do so. The report concluded the system is "not performing at the level needed to reliably provide students with opportunities for mobility and to meet California's future workforce needs" (p.13). Moreover, Hans Johnson, an author of the PPIC report, has stated that "closing the workforce skills gap will require strong improvements in college enrollment and completion among underrepresented groups, including low-income students, first-generation college students, Latinos, and African Americans. California cannot succeed economically unless gaps in educational attainment are eliminated or at least substantially reduced" (Johnson, 2016).

The California State Legislature and California Community Colleges Chancellor's Office (CCCCO) have launched a number of initiatives over the past decade to address these inefficiencies, inequities in student outcomes, and low completion rates. A key area of focus has been providing guidance to students to plan and enroll in prescribed course sequences that lead to specific completion goals. The assumption is that students who are provided with a clear path toward specific completion goals are less likely to veer off track and more likely to progress efficiently (Rosenbaum, Deil-Amen & Person, 2009; Scott-Clayton, 2011; Academic Senate of the California Community Colleges, 2012; Bailey, Jaggars & Jenkins, 2015a).

In 2012, the CCCCO appointed a Student Success Task Force to research and recommend policy changes to improve student success outcomes, specifically addressing low completion rates, and with particular concern for improving outcomes among disadvantaged and underrepresented minority groups. A major recommendation in the report states "Every matriculating student needs an education plan" (p. 23). A parallel report prepared by the Academic Senate of the California Community Colleges also supported mandated educational plans, stating that students may complete unnecessary units, lose motivation and a sense of purpose, and even drop out without academic guidance in the form of a clear, well-developed SEP (2012). The Academic Senate report cited and reiterated the recommendation in the Student Success Task Force report "because of the significant improvement in student success of those students who have and follow [an educational] plan" (p. 5).

Informed by the Task Force recommendations, which were endorsed by the Board of Governors, the California State Legislature passed the Seymour Campbell Student Success Act of 2012. The legislation mandated reforms including integrated matriculation and counseling services. Under this act, all colleges in the CCC system must make every effort to ensure that "non-exempt" students--that is, first-time students with an educational goal of completing a degree or certificate or transferring to a 4-year institution--participate in developing an individual Student Education Plan (SEP) with a counselor. Specifically, Title 5 of the California Education Code requires districts or colleges to "provide students with an opportunity to develop student education plans" (Seymour-Campbell Student Success Act, 2012, sec. 55524). Students who have not initially selected an education goal or program of study may be offered an "abbreviated" plan that maps out courses for one to two semesters. For students who have chosen a course of study, the legislative code states:

> (c) Once a continuing nonexempt student has selected an education goal and course of study, the district shall make a reasonable effort to afford the student the opportunity to develop a comprehensive student education plan describing the responsibilities of the student, the requirements he or she must meet, and the courses, programs, and services required and available to achieve the stated goal.
>
> (e) If a student believes the district or college has failed to make good faith efforts to develop a plan, has failed to provide programs and services specified in the student education plan, or has otherwise violated the requirements of this section, the student may file a complaint pursuant to section 55534 (a). (5 CCR §55524).

SEPs are guiding documents prepared in consultation with counselors to make course-taking patterns more efficient, reduce unnecessary coursework, and expedite completion of graduation requirements, transfer requirements, or both. Specifically, an SEP outlines a student's program of study and provides a roadmap of courses required for completion. SEPs also help colleges design and offer course schedules aligned with anticipated student needs.

While mandating SEPs assumes that better student planning will improve course-taking efficiency and completion, neither the Task Force nor Academic Senate reports referenced any specific research demonstrating that students who develop SEPs achieve greater success in the outcomes they intended SEPs to improve (persistence, completion, and accumulation of excess units). There is some extant research showing that students who take courses at random are more likely to drop out, take unnecessary courses, and become frustrated with their college experience (Deil-Amen & Rosenbaum, 2003; Grubb, 2006). While there are several studies that show counseling and academic advising in general can have a measurable effect on student success (Bahr, 2008; Hagedorn et al, 2008; Henriksen, 1995; Scrivener et al., 2008), none specifically

investigate the role of SEPs. There are several case studies of colleges that have implemented a structured or guided pathways approach, providing students with clear course sequences for every program, that have been credited with contributing to improved graduation rates at 4-year colleges (Jenkins and Cho, 2014; Johnstone, 2015). Similar structured pathways approaches are increasingly being implemented in community colleges as well, utilizing course pathway maps that apply to all students in a program of study. To date, however, there is insufficient evidence to support the assumption that requiring individual SEPs in community colleges is an effective policy for keeping students on track to degree completion and transfer.

Moreover, although SEPs were mandated by the Student Success Act, little specific guidance was provided as to how to implement the mandate, leaving community colleges faced with numerous challenges in obtaining resources and technology to develop and track SEPs. The lack of research and evaluation on SEP development and adherence is due to the complicated nature of the data analysis that would be needed and the data structure in most community college systems. Most community colleges do not have the resources or technology to track course-taking patterns, much less matching course enrollments with those in their SEPs (Scott-Clayton, 2011; Zeidenberg & Scott, 2011). While counselors at community colleges are able to manually review individual student records to determine whether they have a currently updated SEP and have taken specific recommended courses, few are able to track the extent to which students in aggregate are complying with the prescribed courses and units in their SEPs and are therefore on track to timely and efficient completion. Substantial funding has also been allotted to the development of technology that allows students to develop individual SEPs online; however, to date no research or evaluation has determined such self-directed educational planning is effective in increasing the proportion of students who develop and follow SEPs, or

which students use and benefit from this technology. While electronic degree audit and educational planning systems have been developed by private companies for purchase and have been implemented by some colleges within the CCC system, no evidence is available as to whether they increase participation in SEP development, improve SEP adherence, or impact student educational outcomes (RP Group & WestEd, 2012). Extracting aggregate data on course pathway/SEP adherence is also prohibitively complicated within these systems. Perhaps for this reason, there are few published studies examining SEP participation, and there are none looking specifically at adherence, including whether adherence is related to persistence, completion outcomes, or the time it takes students to complete their educational goals.

Study Purpose

Given the ambitious completion agenda to which the CCC system has committed, understanding the effectiveness of its SEP policy is critical, yet very little research is available to illuminate which students develop SEPs or the extent of adherence. Like most community colleges, the CCC system attracts students who are more diverse than 4-year institutions in terms of sociodemographic backgrounds and academic preparation (Bailey, Jenkins & Leinbach, 2005; Deil-Amen & DeLuca, 2010). Students without college-educated parents or family members to help them navigate college matriculation processes may be less likely to develop an SEP, presenting a potential equity issue (Bailey, Jenkins & Leinbach, 2005; Dynarski & Scott-Clayton, 2006; Rosenbaum, Deil-Amen, & Person, 2006). In addition, academic administrators need students to develop and adhere to SEPs, since offering and scheduling courses that align with student needs and ensuring available seats in courses crucial to on-time completion depends upon being able to predict how many students need to take which courses in which semesters. If students do not follow their assigned SEPs, then offering and scheduling courses under that

assumption is misguided. Therefore it is essential for colleges to understand which students develop SEPs, and for those who do have SEPs, whether and how they adhere to them.

The primary purposes of this study are as follows: determine the prevalence of SEP participation among first-time community college students; investigate whether there are differences in background characteristics between students who develop SEPs with a counselor prior to enrolling in community college and those who do not; among those with SEPs, describe adherence in the first year of enrollment; analyze which factors are related to SEP adherence; and determine the assigned courses to which students are least likely to adhere. The study uses student level data from a small California community college, to examine which students develop SEPs at first enrollment, and the extent to which they adhere to these initial SEPs during their first year of enrollment. Currently, counselors in the California Community Colleges system typically lack the technology and resources to examine in aggregate whether students adhere to SEPs, and are therefore on track to complete their educational goals in a timely and efficient manner. Understanding whether development of and adherence to SEPs is related to socioeconomic background, academic characteristics, and participation in student success/retention programs will inform matriculation efforts and pinpoint where nonadherence may be an issue with underserved student populations.

Research Questions

The research questions addressed by this study are as follows:

1. What proportion of first-time community college students have developed Student Educational Plans (SEPs) prior to their first semester of attendance?

2. Are students' demographic backgrounds, educational goals, and participation in student success programs related to development of Student Educational Plans?
3. To what extent do first time community college students adhere to their assigned Student Educational Plans during the first year of attendance?
4. How are students' demographic backgrounds, educational goals, and participation in student success programs related to adherence to their Student Educational Plans?
5. Are there assigned courses and/or requirements listed in students' SEPs that have relatively high rates of nonadherence?

Study Setting

The college I examine in this study is a small single-college district in the northern San Francisco Bay Area, serving approximately 7,500 credit students each year. The county is predominantly White, though the proportion of Hispanic residents has increased 50% over the past two decades. In the past 12 years, the proportion of credit students identifying as Hispanic/Latino has almost doubled at the college, from 16% in 2009-2010 to 30% in 2019-20. Though the county is one of the most affluent in the state, elementary and high school achievement gaps among African-American and Hispanic students and their White and Asian peers are among the largest ([County] Promise Partnership, 2021).[1] Economic inequality and geographic segregation in the county are also among the highest in the state (Menendian, Gailes, and Gambhir, 2020). It is no surprise, then that there are also wide disparities in college

[1] References to the name of the study college have been redacted.

readiness among first-time students entering the college, in terms of state test scores, study skills, the competencies to navigate the higher education system and advocate for oneself successfully ("college knowledge"), and levels of high school English and math completed at the time of first enrollment (academic preparation) ([College Institutional Research Website], 2020a and 2020b). All of these factors contribute to college success, and exercise particularly strong impact during the first year of enrollment. This study seeks to understand whether these gaps are also apparent in SEP development and adherence.

Chapter Two: Conceptual Framework

This study uses behavioral economics as a conceptual framework to understand students' decision-making processes underlying development of and adherence to SEPs in a public community college setting. Behavioral economics is a subfield of economics that has been applied in various disciplines, such as health care, and increasingly in educational research. Behavioral economics incorporates psychological and cognitive factors into the study of behavior to better understand individual decision-making affecting personal outcomes, and to develop policies and interventions that address the shortcomings in decision-making processes (Lavecchia, Liu, & Oreopoulos, 2015; Cartwright, 2011).

Approaching an inquiry about SEP participation and adherence from a behavioral economics perspective is appropriate because individual behavior is complex and situationally dependent, and student decision-making behavior occurs within the context and structure of an institution. Behavioral economics can help us to understand how the structure of academic planning choices available to college students can influence their decisions that impact their educational outcomes. Specifically, this framework helps explain individual decision-making

behavior in choosing to see an academic counselor and develop an SEP, selecting an academic program, enrolling in courses, and persisting within the context of an institution's programmatic structure and support systems such as academic counseling and advising. Ultimately, exploring SEP participation and adherence from a behavioral economics perspective helps inform college personnel how to remove barriers and develop structures and processes that guide students towards making optimal choices.

Traditional economic theory holds that individuals make decisions based on a rational analysis of the cost to them and what they stand to benefit (Tversky & Kahneman, 1974; Cartwright, 2011). However, in real life, decisions are made in a variety of situations, and dependent on the cognitive bandwidth available to make the decision, how the choice that person is making is structured (and therefore perceived by the decision-maker), the time and information available to make the decision, and sometimes factors that are seemingly irrelevant to the decision at hand (Tversky & Kahneman, 1974; Kahneman & Tversky, 1979; Cartwright, 2011). Behavioral economics theory posits that rationality in decision-making is "bounded" by all of these contextual factors in which a choice is being made (Kahneman, 2003). As a consequence, humans may respond in a number of predictable ways that result in suboptimal decisions regarding their long-term self-interest, including using cognitive "shortcuts" in lieu of a thorough cost-benefit analysis, relying on insufficient or irrelevant information, or avoiding making a decision at all (Tversky & Kahneman, 1974; Kahneman & Tversky, 1979; Rosenbaum, Deil-Amen & Person, 2006; Scott-Clayton, 2011).

Within behavioral economics, several situational and contextual factors that "bind" rationality and may impact SEP development and adherence have been demonstrated. One situation that can impact decision making is cognitive or choice overload; when presented with

an overwhelming or complex array of choices, decision-makers may make random choices or not choose at all, because they aren't able to determine which factors are relevant and conduct a rational cost-benefit decision (Chernev, Böckenholt, & Goodman, 2015). Many have posited that this is exactly what community college students experience when choosing a program of study and courses from the daunting selection typically offered at community colleges (Rosenbaum, Deil-Amen & Person, 2009; Scott-Clayton, 2011; Bailey, Jaggars & Jenkins, 2015a). Choice overload may cause students to delay declaring a major/program, or declare one they aren't sure about and later change their mind, having completed coursework that may not count toward their new major. They also might get confused about course offerings and delay registration or enroll in courses that do not count toward their goal. In addition, complexity of choice may disproportionately impact those with less experience navigating matriculation systems, who tend to be lower-income and minority students, resulting in inequity (Bailey, Jenkins & Leinbach, 2005; Dynarski & Scott-Clayton, 2006; Rosenbaum, Deil-Amen, & Person, 2009).

Time-inconsistent preferences may also impact student decision-making (Kahneman & Teversky, 1979; Laibson, 1997). When planning for the future, individuals are more likely to say they prefer the rational/optimal choice, which may cost more in the short term in terms of time resources but pay off in the long run. However, when the choice is in front of them to make in the moment, they may actually select a sub-optimal choice because they are thinking about an immediate but less valuable gain (such as convenience). Students may intend to visit a counselor and develop their SEP, knowing that is the optimal choice for them to get through college efficiently, but procrastinate when it is time to do so because of the time investment or other short-term cost involved.

Similarly, "bounded self-control," known to behavioral economists as "hyperbolic discounting" or "present bias," posits that when faced with trading current sacrifice for future gain, people will perceive the current sacrifice as more costly than the future gain, even when the potential future gain is substantial (Thaler, 1994; Thaler & Sunstein, 2008; Scott -Clayton, 2011). Both time-inconsistent preferences and present bias can be influenced by loss aversion, the thought of sacrificing something immediate such as time (Kahneman & Tversky, 1979; Scott-Clayton, 2011; Castleman & Meyer, 2019). For example, a student may skip their appointment to develop an SEP with a counselor or forego a class on their SEP scheduled at a time when they would rather be doing something else. In the context of SEP compliance, bounded self-control may be a factor in students' decisions to postpone development of SEPs, or delay taking specific courses or unit loads recommended in their SEPs.

Another cognitive heuristic employed by students is availability bias, which describes the tendency to use easily available information to make decisions (Tversky & Kahneman, 1974). Particularly in the face of complex choices in program pathways and information overload, students may simply elect to take courses that seem interesting, or those that their friends are taking, but aren't necessarily those that count toward their credential. Low income and minority students may be disproportionally affected by availability bias, to the extent that they are more likely to attend schools with fewer guidance counselors, institutional and other social supports (Grubb, 2006). Their parents and siblings are less likely to have gone to college and may be less able to act as reliable sources of information about navigating matriculation systems, and their well-meaning advice may not be in the student's best interest in terms of efficient completion (Deil-Amen & Rosenbaum, 2003; Bailey, Jenkins & Leinbach, 2005).

Finally, when faced with decisions, people tend to go with a default option assigned to them or defer to status quo bias, leaving the existing arrangement in place (Samuelson & Zeckhauser, 1988; Thaler & Sunstein, 2008). In the case of mandated SEPs, students are prescribed an SEP based on their educational goal and major whether they develop it in communication with a counselor or whether they receive a default "general education" option. At community colleges, students are typically encouraged but not required to visit a counselor and develop an SEP prior to registration, and may register without having done so (M. Hartman, personal communication, April 27, 2019). Therefore, the default option is *not* to develop an SEP. Even if students have developed an SEP, they may register for any course, not just those on their SEP. Typically at community colleges, students are not automatically registered for the courses on their SEP, so in terms of course enrollment, the default is not to enroll at all. Students without declared majors may be "opted in" to a general education course of study to ensure that all students have a "roadmap" of course options for their major and educational goal, but they may still not be aware of or have looked at which courses they are advised to take; therefore, default roadmaps may not have any impact. Further, even if students have developed an SEP and are thinking about changing their course of study, status quo bias may inhibit them from doing so, leaving them with an outdated SEP.

Over the past decade, applied interventions arising from behavioral economics research have been developed to improve student educational outcomes in higher education, particularly for low-income or disadvantaged students; these are referred to as choice architecture and behavioral nudging. Choice architecture describes the practice of presenting choice-relevant information in a specific way to guide or influence decision-making (Thaler & Sunstein, 2008). Behavioral nudging describes active intervention in the decision-making context to influence a

specific decision (Thaler & Sunstein, 2008). In the context of SEP development and adherence, assigning a default course roadmap to students who have not yet developed an SEP, sending students a reminder text to see a counselor and develop an SEP, sending students a reminder to enroll in their prescribed courses, or sending a warning message that they are off-track in completing their SEP-assigned courses, would all be considered behavioral nudges.

Education researchers have demonstrated that tweaking choice architecture, often in the form of providing complex information in a streamlined and/or clarified way, and/or employing specific behavioral nudges in a number of different processes can improve student outcomes. For example, researchers have found that providing personal assistance and simplified information to parents completing the complex Federal Application for Student Aid (FAFSA) increased submission among low-income and first-generation students, resulting in improved enrollment and persistence (Bettinger, Terry Long, Oreopoulos, & Sanbonmatsu, 2012; Page, Castleman, & Meyer, 2019); that providing simply presented information on schools' academic test scores and students' odds of admission to low-income parents resulted in their selection of higher performing schools (Hastings, Van Weelden and Weinstein, 2007); and that providing personalized financial aid information to low-income students substantially raises their probability of applying to, being admitted at, enrolling at, and persisting at selective colleges (Hoxby & Turner, 2013).

Chapter Three: Literature Review

I next review the prevailing literature and discuss within three dominant themes. First, I present the background information about Student Educational Plans and establish the policy context within the California Community College system. Next, I review literature that discusses

the complexity of navigating academic planning and decision-making in the community college context, including the role of academic counseling and ways students respond to complex planning choices. I then discuss how these increasingly complex processes disproportionately impact the students community colleges intend to serve and the role of navigational capital. Next, I describe recent "structured pathway" interventions designed to streamline academic decision-making processes at community colleges and initial outcomes of these efforts. Finally, I review research on other factors that may impact SEP adherence.

Policy Context

The California Community Colleges Chancellor's Office (CCCCO) has responded to the problem of inefficient completion by focusing on underlying structural barriers and opportunities for reform. In 2017, the CCCCO defined a systemwide goals to meet California's workforce needs it calls the "Vision for Success" (Foundation for California Community Colleges, 2017). The Vision for Success defines a set of systemwide accountability metrics, including milestones on the path to completion, and tracks them for each college in the system. For example, citing the cost to taxpayers and students, the CCCCO identified accumulation of excess degree units as a major factor inhibiting timely completion, and in response, set a systemwide goal to reduce the average units earned at the time of completion from a baseline of 87 in academic year 2015-16, to 79 by 2021-22. Most associate degrees require 60 units to complete. Zeidenberg (2012) examined data from a state community college system, determining that in most programs, 50% to 80% of students who earned associate degrees earned excess credits not applicable to their program. On average, students earned 14 excess credits, excluding credits from developmental courses, accounting for an average of 12% of all credits earned by those students, depending upon their program. Many of these units also do not count toward transfer. Even students who

transfer to a public four-year university are unable, on average, to apply 20 percent of the credits they earned at a community college toward a bachelor's degree (U.S. Government Accountability Office, 2017). Fink, Jenkins, Kopko, & Ran (2018) also conducted a study on transfer inefficiency, finding that community college students' course-taking patterns contribute to accumulation of excess credits, up to 30% of which were not transferable to 4-year institutions. However, Baker's research suggests that students completing streamlined associate for transfer (ADT) programs, which offer restricted course sequences resulting in a 2-year degrees designed for direct transfer into California's UC and CSU systems, graduated with fewer excess units accumulated by graduation than those pursuing traditional 2-year AA and AS degrees (2016).

In addition to the Vision for Success, the CCCCO has employed a variety of equity-focused, systemwide initiatives to address excess unit accumulation, increase persistence, and streamline completion, which include: Guided Pathways, which focuses on structural and organizational changes to community colleges to provide clearer pathways into, through and out of college; Assembly Bill 705 (AB 705), which abridges the remediation sequence in English and Math and refines the standardized student assessment process for placing entering students; and the Student Equity and Achievement Program (SEAP), which consolidates efforts across the system's colleges to better support comprehensive reform and eliminate achievement gaps for disproportionately impacted student populations.

In 2017, the CCCCO piloted the reform initiative known as "Guided Pathways," at 20 of its 114 colleges based on structured pathways research (Bailey, Jaggars & Jenkins, 2015a; California Community Colleges Chancellor's Office, 2017). Today it is a systemwide mandate. Guided Pathways encompasses broad changes in institutional structure and student support

services. Its broad intent is to improve completion and close equity gaps among the system's 114 colleges. Specifically, the Guided Pathways model includes four pillars: 1) clarify pathways to credentials; 2) help students choose and enter one of these pathways; 3) help students adhere to their program pathway; and 4) ensure students are gaining the competencies intended for their credential. Guided Pathways "creates a highly structured approach to student success that provides all students with a set of clear course-taking patterns to promote better enrollment decisions" (California Community Colleges Chancellor's Office, 2020). These program maps are intended to impose structure on an unwieldy array of choices and lessen the impact of "choice overload" in students' decision-making. Student Educational Plans (SEPs) are a crucial tool for implementing the Guided Pathways framework at the student level.

SEPs are guiding documents prepared in consultation with counselors to make course-taking patterns more efficient, reduce unnecessary coursework, and expedite completion of graduation requirements, transfer requirements, or both. Specifically, an SEP outlines a student's program of study and provides a roadmap of courses required for completion. The SEP was developed in order to guide new students through a morass of schedules, course content descriptions, prerequisites, degree requirements, and other institutional information that may be difficult to find, located in different places, or indecipherable to inexperienced students. In addition, required courses may be full during the semester desired or may not be offered every semester, so foregoing a course one semester may create a risk of not being able to take it later, resulting in cascading disruption to students' pathways to degree or transfer. Scott-Clayton (2011) refers to these conditions, along with other structural hurdles, as the "decision-making context" within which students enroll, register, and persist at an institution. Scott-Clayton (2011, p.11) elaborates:

> In the community college context, the pathway from initial application to course enrollment requires numerous active decisions, where the default is simply not to enroll. In the face of confusion, students also may be unduly influenced by idiosyncratic factors such as whether a friend is enrolling in a particular program or course. This tendency to base decisions on easily accessible information is often referred to as "availability bias" (see, e.g., Tversky & Kahneman, 1974).

In theory, SEPs prevent students from making inefficient, costly course-enrollment choices based on inadequate or irrelevant information such as Scott-Clayton describes.

Choice and Decision-Making in the Community College Context

The Role of Academic Counseling and Advising in SEP Development

As mentioned in Chapter 1, the 2012 Student Success Act mandates that all students with a degree, certificate, or transfer-seeking educational goal should develop an SEP with a counselor. However, in practice, colleges within the CCC System do not typically prevent students from enrolling in credit courses if they have not yet developed an SEP, because of the burden it would impose on counselors as well as students, and the deleterious impact such a practice would have on enrollment. Within the community college context, students may not develop an SEP, delay developing an SEP, or veer off from their prescribed SEP, for a number of reasons. First, community colleges are open-access institutions. Entering students are more likely to not have gone to college otherwise and may be more tentative about their academic goals compared to students who enter more selective institutions (Bailey, Jenkins & Leinbach, 2005; Grubb, 2006; Scott-Clayton, 2011; Bailey, Jaggars & Jenkins, 2015a). The role of a student's academic advisor or counselor is key in guiding students' academic decision-making. Karp (2013) describes the role of the academic counselor in the context of two theories: the

"developmental" theory of counseling, in which the counselor/advisor facilitates the student's self-exploration in the process of making academic and career decisions, and the Cognitive Information Processing theory, which assumes a problem-solving approach, where students are introduced to a more analytical decision-making process. The point of both is to provide students not only with information about programs and requirements, but to equip them with the skills to make well-informed, self-aware choices in academic and career decisions. Jaggars & Fletcher (2014) describe the counseling process as occurring in two phases: goal development and then planning for academic and career progress. Both phases correspond with development and adherence to SEPs.

However, counseling departments at community colleges are often not equipped to provide the level of guidance many of their students need. Grubb (2006) was concerned that colleges typically provide an "information dump" to inform students about degree requirements without also providing career counseling—helping undecided students develop career interests and plans—or taking into consideration the students' other needs such as work life and home life, or a broad awareness of potential careers they might pursue. Grubb (2006) elaborates, "If students are not sophisticated in their use of information... an 'information dump' cannot be an effective way to help students make decisions in their own interests" (p. 212).

The availability and quality of counseling guidance at the community colleges is also likely to impact whether students develop and adhere to SEPs. The ratio of counselors to students, the ability and experience of counselors to be effective in advising disadvantaged student populations, and the organizational structure of counseling services all impact the level and quality of service students encounter (Grubb, 2006). Community college counseling offices often offer mainly drop-in appointments or other restrictions, such as having to see different

counselors for different purposes, that limit individualized time with counselors, create confusion and frustration, and/or otherwise create barriers to access (Karp 2013, Grubb 2006). These conditions all potentially inhibit students from developing appropriate SEPs that consider their education and career goals, life circumstances, and understanding of degree requirements.

Even among students who do make counseling appointments to develop an SEP, many do not follow through. Visher and colleagues (2016) found that community college students receiving guaranteed access to counseling and a nudging intervention to remind them of their appointments increased academic plan completion rates by more than 20 percentage points compared to a control group who received neither intervention. However, the majority still did not develop an academic plan, and many did not show up at their counseling appointments, suggesting that behavioral incentives aren't sufficient to engage many community college students in academic planning. Among those in the non-intervention control group, the completed SEP rate was only 19% (Visher, Mayer, Johns, Rudd, Levine, & Rauner, 2016).

Rather than relying on counselors, students may respond to advice from other sources who are less informed about college policies. Grubb (2006) found many counselors he interviewed reported that students rely on friends for advising information. Similarly, according to a seasoned community college counselor, taking a course because a friend is also enrolled is a fairly common reason given by students for taking courses outside of their prescribed SEPs, which often do not count toward degree or transfer requirements (G. Cullen, personal communication, May 14, 2019). Deil-Amen & Rosenbaum (2003) found that 2-year college students "who had not chosen a major had not sought counselor advice about their course selections in the first year," thus accumulating random course credits but not necessarily progressing toward their degree (p.126). They describe students' dilemma as follows:

> Even after students have chosen a program, choosing classes is still a daunting task. It can be difficult to schedule all the required courses in the correct order while still paying attention to prerequisites and general education courses and synchronizing course schedules with work and family schedules. We encountered many students who were confused about general education requirements and the necessary prerequisites for their major courses. If students do not fulfill a course requirement, they may have to wait an entire year before the course is offered again. These mistakes can be overwhelming setbacks for students with limited resources and constrained timetables, and they can lead to disappointment, frustration, and eventual dropout (p. 126).

Grubb (2006) echoes this concern, adding that when colleges offer many complex programs and requirements, "the lack of access to counseling may discourage some students—particularly nontraditional students" (p. 210). Moreover, colleges may not have the resources to provide adequate advising regarding educational goals (Grubb, 2006). It may only be practical for these colleges to offer enhanced counseling resources to students most in need. Understanding which students are less likely to develop and/or follow SEPs is one way to identify such students for outreach or nudging.

The Problem of Too Much Choice and the Structure Hypothesis

The importance of counselors is especially acute when choices are complex. Grubb (2006) describes the skills that students are typically expected to incorporate into making rational decisions about college planning, and how these choices can be particularly different for first-generation and/or nontraditional college students:

> To make rational decisions, individuals must have well-formed preferences, which ''experimenters'' and ''undecided'' students lack by definition. They need to be able to

> weigh present and future possibilities and the trade-offs among them; without the capacity of ‘‘planfulness,’’ it is hard to know what career and course planning might mean. They must understand probabilistic events and be able to weigh educational and occupational alternatives with different probabilities of success. They must consider a wide range of alternatives including some, like formal schooling itself, where they have been treated badly in the past and that they may not be able to consider dispassionately and rationally (Reay and Ball, 1997). For some students, the ‘‘choice’’ of an occupational area involves the complex process of developing a very different identity (Hull and Zacher, 2002)—a particularly difficult process for women contemplating nontraditional employment, working-class youth and first-generation students trying to move into middle-class occupations, or immigrants trying to assimilate into a new country. Even if information is available, it just stays there, inert and unused by students in decision making (p.212).

In response to these challenges, which inhibit successful development and completion of academic plans, over the past 2 decades scholars have turned to examining the situation at community colleges from a structural perspective (Rosenbaum & Deil-Amen, 2003; Rosenbaum, Deil Amen, & Person, 2009; Scott-Clayton, 2011; Bailey, Jaggars, & Jenkins, 2015a). These researchers point out that a loose structure is inherent to community colleges, in part because they serve students with such diverse educational goals and needs (Bailey, Badway & Gumport, 2001; Deil-Amen & Rosenbaum, 2003; Scott-Clayton, 2011; Bailey, Jaggars, & Jenkins, 2015a). The Structure Hypothesis provides a comprehensive review of evidence to argue that lack of structure in community colleges restricts access, particularly for low-income and first-generation students, and also contributes to high dropout/low completion rates (Rosenbaum & Deil-Amen,

2003; Rosenbaum, Deil Amen, & Person, 2009; Scott-Clayton, 2011; Bailey, Jaggars, & Jenkins, 2015a). The structure hypothesis is defined by Scott-Clayton (2011) as follows: "that community college students will be more likely to persist and succeed in programs that are tightly and consciously structured, with relatively little room for individuals to unintentionally deviate from paths toward completion, and with limited bureaucratic obstacles for students to circumnavigate" (p.1). Essentially, supporters of structural solutions to reduce poor student decision-making outcomes advocate for redesigning college programs and student support services to reduce the amount of information students are expected to navigate in developing an educational goal and enrolling in the right courses to complete that goal. The structure hypothesis has spurred structural reform efforts throughout the U.S., typically described as "structured pathway" models. The Guided Pathways initiative the CCC system launched in 2017 is one example.

The role of choice in community colleges is at the center of a debate about structured pathway models as a tradeoff between unfettered choice and highly structured programs that offer little or no opportunity for deviation, but that, if followed, result in vastly more efficient course-taking patterns. Proponents of structured pathways posit that too much choice is overwhelming to students, particularly those coming in with a lack of college navigational skills, resulting in a kind of choice paralysis in which students either make poor choices or avoid making them at all (Rosenbaum, Deil-Amen, & Person, 2009; Scott-Clayton, 2011; Bailey, Jaggars & Jenkins, 2015a). On the other hand, many see structured pathways as antithetical to a traditional mission of college education-to allow students to explore various disciplines and enrich their minds with unlimited freedom. In addition, Baker (2016) points out that fewer program choices may discourage undecided students from enrolling, or result in loss of enrollment due to students choosing other colleges. In a mixed structured pathway model, such

as that being espoused by the CCC system, students may select from a variety of courses within "meta-majors," or areas of broad interest within which students may explore. In this model, the SEP serves as a crucial guiding document, in which students may choose between different courses they are interested in exploring that still meet degree and/or transfer requirements, yet have a clear path to completion within those choices.

However, students may not know what they want to do when they enter college, which could influence whether they choose to develop an SEP in the first place (Gardenhire-Crooks, Collado, & Ray, 2006). Leaning heavily on students to choose a pathway or major could actually have a negative impact on persistence, if students feel compelled to choose, invest time and money in courses on a particular pathway, and then change their mind about pursuing it (Scott-Clayton, 2011). Likewise, students may delay making a decision about committing to a particular program when the decision is complicated and consequential (Scott-Clayton, 2011). Though limiting program and course choices provides one potential solution to this problem, a better understanding of development and adherence to SEPs will help inform efforts to improve choice structure while still providing students with opportunities to explore different subjects and pathways.

College Knowledge/Navigational Capital

Students of differing backgrounds may differ in their experience and preparation to navigate the community college decision-making context. The complex structure of program choices typical at community colleges requires "college knowledge" or navigational capital, which creates an additional burden on traditionally underrepresented students, who are least resourced in this area (Deil-Amen & Rosenbaum, 2003; Rosenbaum, Deil-Amen, & Person, 2009; Scott-Clayton, 2011; Karp, 2013; Bailey, Jaggars, & Jenkins, 2015a). College navigational

capital refers to a student's knowledge, skills and strategies to successfully maneuver through college systems (Yosso, 2005).

Deil-Amen and Rosenbaum (2003) identified seven obstacles inherent in the structure of typical public community colleges that disproportionately impact low-income and/or first-generation students without experience or support in college navigation. Without effective advising and counseling, these obstacles are common precipitators of dropping out, or at least, wasted time and money. The first two, "bureaucratic hurdles," such as difficult-to-find schedule information and requirements, and "confusing choices," having to do with the overwhelming array of programs and requirements; and limited counselor availability, are discussed above. The "burden of student-initiated assistance," refers to the expectation that students will, on their own, seek guidance from a counselor before enrolling (Deil-Amen & Rosenbaum, 2003; Grubb, 2006). Many students whose parents and friends have not attended college may not be aware that they should see a counselor to develop an SEP. Even for students who do, many traditionally disadvantaged students do not know which questions to ask. Bailey, Jenkins & Leinbach (2005) note that because community colleges are comprised more of first-generation and low-income students, they may be less able to seek advice from their social and familial networks. Grubb (2006) interviewed deans, counselors and students at various colleges, concluded that the most "motivated" students were the least in need of counseling but the most likely to seek and follow through with counseling services. Conversely, students who need more academic support may instead rely on their families for information, or underutilize support services (Grubb, 2006). Community college students are also less likely than those attending 4-year institutions to have access to extensive information networks (Bailey, Jenkins & Leinbach, 2005).

Finally, Deil-Amen and Rosenbaum (2003) identified "delayed detection of costly mistakes," which is a function of first-generation students' lack of information and understanding about the system itself. The authors state, for example, that many students may not even understand what type of degree they are seeking or how long it will take them to earn it; misinformation about remedial courses counting toward a degree, as well as taking non-transferable courses without realizing they did not count toward transfer, was common among the students they interviewed. Given this finding, improving rates of SEP development and adherence may have a particularly positive impact on completion outcomes for students who lack navigational capital, who are more likely to be the first-generation, low-income students of color.

This finding makes it especially important to examine SEP participation and adherence. The impact of changing default options might improve outcomes particularly for students who lack navigational capital, and to the extent that this is related to socioeconomic characteristics, improving counseling processes may help close existing gaps.

Other Factors Affecting SEP Development and Adherence

Finally, although the 2012 Student Success Act mandates that colleges encourage all non-exempt students to develop an SEP with a counselor prior to first enrollment, typically colleges in the CCC system do not prevent students from registering for courses even if they have not done so. But to incentivize meeting with a counselor, some colleges give students who have developed an SEP priority registration, which is earlier access to the course offerings of their choice (M. Hartman, personal communication, April 27, 2019). In addition, counselors typically do not review or track students' adherence to their SEPs unless the student has made an appointment, and students are not prevented from registering for courses that are not part of their

plan. In a case study comparing the typical structure of a 2-year private technical college and a public community college, Bailey, Badway & Gumport (2001) suggested that the sequence in which students are required to take courses may impact persistence. The private technical college required students to take technical classes in their program major first and general education classes in the second term, with the notion that students would be more engaged in courses of their stated interest before being required to take more abstract liberal arts courses. Typically, community colleges do the inverse, frontloading general education requirements that students find least interesting, possibly leading to disengagement. Though examining SEP sequence adherence is beyond the scope of this study, it is an area of research that may also have implications for counseling practices and should be further explored.

Summary

Mandated SEPs are based on the logical assumption that clearly planned and communicated course-taking sequences will improve student decision-making, lead to more efficient course taking, and increase student completion outcomes. However, whether and which students create SEPs in a timely manner, and the extent to which students adhere to their assigned courses, has not yet been sufficiently examined or evaluated in practice.

To date there is some evidence that providing students with structured pathways that narrow their course-taking choices is correlated with positive milestone and completion outcomes (Deil-Amen & Rosenbaum, 2003; Bailey, Jaggars & Jenkins, 2015b; Baker, 2016). However, there is no empirical study examining the degree to which students comply with such planned course sequences, and how strongly adherence to specific assigned courses is related to an individual's likelihood of completion.

This study examines an essential mechanism by which students will experience the CCC Guided Pathways initiative—Student Educational Plans. The initiative will only be successful if students develop and adhere to SEPs aligning with the roadmaps or "meta-majors" developed by colleges. California's community colleges are open access, and students are typically free to enroll in any course they choose, with the only major limitation being course prerequisites. To some extent, colleges may restrict course-taking choices in their implementation of Guided Pathways, either by eliminating courses and/or programs, consolidating courses available across programs, or otherwise narrowing opportunities for deviation. Understanding development and adherence to SEPs will be imperative to making such decisions and evaluating and improving Guided Pathways implementation.

Thus, in this study, I ask the following research questions:

Research Question 1: What proportion of first-time community college students have developed Student Educational Plans (SEPs) prior to their first semester of attendance?

Research Question 2: Are students' demographic backgrounds, educational goals, and participation in student success programs related to development of Student Educational Plans?

Research Question 3: To what extent do first time community college students adhere to their assigned Student Educational Plans during the first year of attendance?

Research Question 4: How are students' demographic backgrounds, educational goals, and participation in student success programs related to adherence to their Student Educational Plans?

Research Question 5: Are there assigned courses and/or requirements listed in students' SEPs that have relatively high rates of nonadherence?

Chapter Four: Study Measures and Analysis

As described in Chapter One, this study examines SEP participation rates and adherence in a small single-district community college partnership in the San Francisco Bay Area. I analyze three years of participation rates and outcomes for students categorized as "first-time" college students. First, I describe the dataset and construction of the main variables in this study, including student socioeconomic characteristics, SEP participation, and SEP adherence. Next, I present summary statistics describing SEP participation levels across socioeconomic factors, academic variables, and student success program participation. I then quantify differences in rates of participation and adherence by socioeconomic characteristics, student success program participation, educational goal, and high school GPA. Finally, I examine patterns of nonadherence to determine if specific courses or requirements assigned in students' SEPs have particularly high rates of nonadherence.

Dataset

For this study I rely on a dataset representing first-time, degree-seeking student enrollment at the study college in fall semesters from 2017 though 2019. "Degree-seeking" students are those who, at first enrollment, declared an educational goal of completing an associate degree or transferring to a 4-year institution. "First-time" students are those who were attending any postsecondary institution for the first time after completing high school. Students who met the first-time and degree-seeking criteria, and who were enrolled in at least one credit course in the first fall semester, were included in the dataset. The full analytic dataset for this study includes a total of 1,142 unique students.

The dataset was compiled by the IT Department at the study college from student enrollment records extracted from the college's internal student enterprise reporting system

(Banner) and SEPs extracted from the college's counseling tracking system (DegreeWorks). A student with an established SEP is operationalized as "incoming students who complete a counselor-approved semester-by-semester plan listing the courses they need to achieve their education goal, whether it is a certificate, an associate degree, or transfer to a four-year institution." Specifically, the SEP data consists of a list of courses assigned, including the number of units for that course, for each individual student to complete during the first two terms (fall and spring) of enrollment. Only SEPs that were established as of students' first semester of enrollment were included; if a student established an SEP subsequent to the first semester or the original SEP was modified, these changes were not included. Each student whose record indicates an educational plan was developed and a counselor signed off on the plan, resulting in a status of "complete," are coded as 1 ("yes"), and those who either developed a partial or incomplete plan, or did not meet with a counselor to develop a plan at all, are coded as 0 ("no"). The data from Banner includes student course enrollment and grades for the first two consecutive semesters (Fall and Spring) of enrollment at the college. In addition, the Banner data includes student demographic characteristics, academic characteristics including educational goal and declared major, and indicators of participation in the college's student success programs and/or learning communities.

Students' records from the two systems were matched on the unique student identifier assigned when the student first applied to the college. The unique identifier is only used internally by the college. To deidentify individual students and eliminate the possibility of deductive disclosure, each student in the dataset was assigned a random, separate unique identifier that could not be traced back to any individual student record in Banner or DegreeWorks.

Measures

Study Database and Variable Construction. Variables created for the study are described in Table 1. Key study variables include a binary measure of SEP participation, defined as having met with a counselor and developed a Student Educational Plan prior to the enrollment deadline of their first fall semester at the college.

Of the 704 students who had developed an SEP at first term, 293 were excluded from the adherence phase of analysis, because they either 1) did not persist until the end of the first fall semester of enrollment; 2) did not enroll in the following spring semester, or 3) had only developed an SEP for the first semester, and had not updated their plan at the time of enrollment in the spring semester. The remaining number of students was 413, comprising the final analytic sample for the SEP adherence questions in this study. For each student in the adherence sample, a proportion measure of SEP adherence is calculated using that student's specific SEP.

Each student's SEP includes a list of specific courses and/or course areas within GE pattern clusters required to achieve their specific goal and major (for example, to obtain an associate degree in nursing at the College, to complete a Biology GE pattern and transfer to a college within the University of California system, or to meet transfer requirements for a specific private college) to complete during the first fall and spring semesters of enrollment. Figure 1 shows an example of an SEP for a student whose goal is to complete a Biology GE pattern and transfer to a UC. This list of assigned SEP courses/course areas was then matched with actual course enrollments during the first year. For each course or specific GE course area assigned during the first fall and spring semester, an indicator variable was coded to indicate the course was part of the first-year assigned SEP. Then, for each first year assigned course, a value of 1 was assigned if a matching course enrollment occurred in either the first fall or spring of

enrollment, and a value of 0 was assigned if the student did not take the assigned course during that time. The total number of units associated with the courses assigned in the student's first-year SEP was then calculated. The total number of units for courses coded as having a matching enrollment was also calculated. I use SEP-assigned course units to calculate the adherence measure rather than the number of courses, because courses range from 0.5 units to 5 units, so using the number of courses would give unequal weight to low-unit courses. In addition, courses that are most consequential in terms of progression and completion are typically worth 3 to 5 units. So, for each student, the continuous variable ADHERENCE was calculated using SEP-assigned units and matching enrollments, as follows:

$$\frac{\text{Total number of year 1 units assigned in the SEP with a matching enrollment}}{\text{Total number of year 1 units assigned in the SEP}}$$

An additional field was coded to track courses taken outside of the SEP, including if the course was assigned to be taken after the first year, or if the course was not assigned in the SEP at all. This last field was calculated to provide a basic description of adherence patterns, but is not included in the adherence measure for inferential analysis.

Year 1 Assigned SEP

Course/Area	Units	Courses
Composition	3	1
Biology 110	3	1
Any Elective	3	1
Prob. And Stats	4	1
Literature	3	1
Any History	3	1
Any Elective	3	1
Any Language	3	1
Total Assigned	25	8

Actual Schedule Taken

	Course	Units	Course in Plan	Course Not in Plan
Courses in Plan	Composition	3	1	0
	Biology 110	3	1	0
	Kinesiology	3	1	0
	18th Century Lit	3	1	0
	US History	3	1	0
	Music Theory	2.5	1	0
	Spanish 3	3	1	0
Not in Plan	Intro. Guitar	2	0	1
	Intro. Accounting	3	0	1
	Total Taken	25.5	7	2
	Total Taken In-Plan	20.5	7	
	Total Taken Non-Plan	5	2	

Adherence: Total Units Taken In-Plan vs. Total Units Assigned =20.5 / 25 = 0.82

Figure 1. Sample SEP and Adherence Measure Calculation

I examine SEP participation and adherence by student demographic characteristics to determine whether equity gaps exist. Specifically, I include students' self-reported race/ethnicity, gender, first generation status, and economic disadvantage. With the exception of economic disadvantage, the source of student demographic data is CCCApply, the CCC systemwide admissions application that all students must complete before enrolling in a California Community College. These data are automatically uploaded into Banner when the application is submitted by the student. Race/ethnicity is collected via a multiple response question with 29 fields indicating various categories, which are coded into the broad consolidated categories presented in Table 1 (Black or African American, Asian or Pacific Islander, Hispanic/Latino/a/x, White, Two or More Races, Other Race or Not Reported). Students who selected racial identities

in more than one broad category are coded as "Two or More Races." Gender is coded as either Male, Female, or "Other or Not Reported." At the time of this study, CCCApply only included those response options and did not include expanded options for students to report gender identity or sexual orientation.

Socioeconomic variables. First generation status is coded according to the CCCCO guidance using parent/guardian education level data reported for both parents in CCCApply.[2] Per this guidance, first-generation status in this study is defined as "a student for whom no parent or guardian has earned more than a high school diploma and who has no college experience." Students were classified as "economically disadvantaged" if they applied for financial aid for their first academic year using the Free Application for Federal Student Aid (FAFSA) and qualified under the federal criteria for a Pell Grant, and/or applied for the California College Promise Grant and met the income criteria to receive a fee waiver under that program.[3]

Academic predictors. In addition to student demographic background, I examine SEP participation and adherence by declared educational goal. These data are also reported by students in their CCCApply application and uploaded into Banner. As mentioned in Chapter 1, the 2012 Student Success Act mandates that all students with a degree, certificate, or transfer-seeking educational goal should develop an SEP with a counselor. For this study, I only include students with the following educational goals: "obtain a 2-year associate degree without transfer," "obtain a 2-year associate degree without transfer" or "transfer to a 4-year institution without obtaining associate degree." Certificate seeking students are not included in this study, because certificate programs at the study college are typically only one year in length, and the

[2] California Community Colleges Chancellor's Office. December 2014. Analysis of Parent Education Data Element.
[3] Qualification for a Federal Pell Grant is based on a standard financial need formula including net income, net assets and family size. The California College Promise Grant Application considers California residency or non-resident eligibility under the California Dream Act, as well as dependent status, household size, and net income.

required courses are mapped out with little to no variation or choice. In the case where a student meets with a counselor and decides to change their declared educational goal, the counselor will update the information in Banner. For students who reported an original educational goal in CCCApply but changed their goal while developing their initial SEP with a counselor, the data reflects the SEP- updated goal at the first fall semester of enrollment.

In addition, I include self-reported high school grade-point average (GPA) as a proxy measure of motivation and academic preparation, which may impact both SEP participation and adherence. CCCApply asks students to report unweighted high school GPA and limits responses within a range of 0.0 to 4.0. Of the 1,142 students in the dataset, 1,018 (89%) had reported a high school GPA. Those who are age 22 or older at the time of their application are not required to answer questions about their high school, so comprise the 11% with missing GPA information. To ensure all student records could be used in the regression analysis, including those with no reported GPA, and also to yield more easily actionable results, GPA was coded into a categorical variable as follows: <2.0; 2.0-2.49; 2.5-2.99; 3.0-3.49; 3.5-4.0 ; and "No high school GPA reported." Finally, in my adherence analyses only, I include a measure capturing the total number of SEP units assigned.

Program participation predictors. I include participation in the college's first-year student success/retention programs as control variables. As discussed in Chapter 3, first-generation students and those belonging to historically underrepresented groups may experience disproportionate impact in terms of the navigational capital or "college knowledge" required to navigate the matriculation system. The first-year success/retention programs in place at the college have been established to close equity gaps in persistence and completion, and to provide students with skills to succeed in their first year of college. Students participating in these

programs receive guidance on navigating the matriculation process, so may be more likely than non-participants to have developed an SEP and/or have higher rates of SEP adherence. Because these programs encourage recruitment of historically underrepresented students, the impact of program participation on SEP participation and adherence may offset potential disparities associated with demographic and socioeconomic characteristics. The program variables in the dataset are binary measures of participation during the first semester of enrollment, and include Extended Opportunity Programs and Services (EOPS), as well as three learning communities: UMOJA, geared toward the college's African-American students; Puente, geared toward the college's Latino/a/x students; and the MAPS program, geared toward first-generation students. In addition, I include a variable indicating whether the student participated in Summer Bridge, the college's summer college preparatory program, which also includes guidance on the college's matriculation process. Students typically only participate in one learning community, but may simultaneously receive support from EOPS, and a large proportion also enroll in Summer Bridge in the summer prior to first enrollment.

Table 1: Study Variable Descriptions

Variable Name	Description	Coding
Key Study Variables		
SEPPART	Student had an SEP in place at first semester of enrollment	=1 if yes; =0 if no
ADHERENCE	Proportion of units assigned in SEP student enrolled in during first 2 semesters	Proportion between 0 and 1
TOTSEPUNITS	Total number of units assigned in first year of student's SEP (used in adherence model only)	Continuous between 3 and 43

Demographic Variables		
ASIAN	Student identifies as Asian or Pacific Islander	=1 if yes; =0 if no
BLACK	Student identifies as African-American or Black	=1 if yes; =0 if no
LATINX	Student identifies as Hispanic/Latino/a	=1 if yes; =0 if no
MULTIRACE	Student identifies as two or more races	=1 if yes; =0 if no
WHITE	Student identifies as White	=1 if yes; =0 if no
OTHRACE	Student reported another race or race/ethnicity is unknown/unreported	=1 if yes; =0 if no
FEMALE	Student identifies as female	=1 if yes; =0 if no
MALE	Student identifies as male	=1 if yes; =0 if no
OTHGENDER	Student's gender identity is other or not stated	=1 if yes; =0 if no
Socioeconomic Variables		
FIRSTGEN	Neither of student's parents attended college	=1 if yes; =0 if no
ECONDIS	Student is eligible for a California Promise Fee Waiver or federal Pell grant	=1 if yes; =0 if no
Academic Predictors		
DTRANSFER	Student's stated educational goal is "obtain an associate degree and transfer to a 4-year institution"	=1 if yes; =0 if no
DEGREEO	Student's stated educational goal is "obtain a 2-year associate degree without transfer"	=1 if yes; =0 if no
TRANSFERO	Student's stated educational goal is "transfer to a 4-year institution without obtaining associate degree"	=1 if yes; =0 if no
HSGPA	Student's self-reported high school GPA	Grade point average between 0 and 4
GPA2	High school GPA is <2.0	=1 if yes; =0 if no
GPA2_249	High school GPA is 2.0-2.49	=1 if yes; =0 if no
GPA25_299	High school GPA is 2.5-2.99	=1 if yes; =0 if no
GPA3_349	High school GPA is 3.0-3.49	=1 if yes; =0 if no
GPA35_4	High school GPA is 3.5-4.0	=1 if yes; =0 if no
NOGPA	No high school GPA reported	=1 if yes; =0 if no
Success/Retention Program Participation Predictors		
EOPS	Student participates in the EOPS program	=1 if yes; =0 if no
LC	Student participated in a student success learning community during first semester of enrollment	=1 if yes; =0 if no
SUMBRIDGE	Student participated in Summer Bridge Program prior to Fall enrollment	=1 if yes; =0 if no

Data Analysis

SEP Participation. First, I perform a series of oneway ANOVA analyses to describe the proportion of students in each demographic and academic subgroup who have developed an educational plan and to inform the selection of a reference group for subsequent regression analysis. The dependent variable is the binary SEP participation variable indicating whether the student had completed an SEP prior to the first term of enrollment. Independent variables are categorical descriptors of race/ethnicity, gender, first-generation status, economically disadvantaged status, educational goal, high school GPA, EOPS participation, learning community participation, and Summer Bridge participation. For independent variables for which there are more than two categories (race/ethnicity, high school GPA coded categories, and educational goal), Bonferroni post-hoc tests are performed to determine whether differences in the proportion of students within each category are statistically significant when correcting for multiple comparisons (Bland & Altman, 1995). For all inferential analyses, I use a level of .05 to determine whether differences are statistically significant. For the oneway ANOVA analyses, I describe the overall significance of the model and if the model is significant, I add Bonferroni post-hoc comparisons. For the post-hoc comparisons, the .05 significance threshold is the level of significance after the adjustment for multiple comparisons.

Using a linear probability regression model, I then determine whether disparities in SEP participation rates are statistically significant when controlling for demographic/socioeconomic variables, academic preparation, educational goal, and participation in success/retention programs. The Linear Probability Model (LPM) uses ordinary least squares (OLS) to predict binary outcomes rather than continuous outcomes. I use LPM instead of logistic regression

because the coefficients represent a linear increase in probability rather than an odds ratio, and are therefore easier to interpret and explain (Long, 1997). Specifically, I fit the following model:

$$\text{SEPParticipation}_i = \beta_0 + \beta_1 \text{RACE}_i + \beta_2 \text{FEMALE}_i + \beta_3 \text{FIRSTGEN}_i + \beta_4 \text{ECONDIS}_i + \beta_5 \text{DTRANSFER}_i + \beta_6 \text{GPA}_i + \beta_7 \text{EOPS}_i + \beta_8 \text{LC}_i + \beta_9 \text{SUMBRIDGE}_i + \varepsilon_i$$

where β_0 is the intercept term. β_1 are coefficients from a vector of indicators for the race/ethnic groups defined in Table 1; β_2 is a series of indicators for gender, including an indicator for gender unknown; β_3 and β_4 are dichotomous variables marking first-generation and economically disadvantaged status; β_5 are indicators for each educational goal; β_6 are categories for high school GPA, including a category for no GPA available; and β_7 - β_9 are dichotomous indicators of participation in EOPS, learning communities, and Summer Bridge. In this model, the reference groups are: Hispanic/Latino/a/x, female, first-generation, economically disadvantaged, educational goal of degree+transfer, high school GPA <2.0, participant in EOPS, participant in learning communities, and participant in Summer Bridge.

SEP Adherence. To examine SEP adherence during the first year of enrollment, I first describe the mean adherence rate for the sample as a whole as well as for each subgroup (student demographic characteristics, educational goal, participation in student success programs, and high school GPA). I then use oneway ANOVA analysis to determine whether within-groups differences in mean SEP adherence are statistically significant, and to inform the selection of a reference group for subsequent regression analysis. In addition, I examine the relationship between adherence the number of units assigned in the first year of SEPs to determine if this factor should be added to the final regression model. Finally, I employ OLS regression to examine whether associations between mean SEP adherence and demographic/socioeconomic

variables are statistically significant when controlling for educational goal, high school GPA, SEP units assigned, and participation in student success/retention programs. Specifically, I fit the following model:

$$\text{Adherence}_i = \beta 0 + \beta_1 \text{RACE}_i + \beta_2 \text{FEMALE}_i + \beta_3 \text{FIRSTGEN}_i + \beta_4 \text{ECONDIS}_i + \beta_5 \text{DTRANSFER}_i + \beta_6 \text{GPA}_i + \beta_7 \text{EOPS}_i + \beta_8 \text{LC}_i + \beta_9 \text{SUMBRIDGE}_i + \beta_{10} \text{SEPUnitsAssigned}_i + \varepsilon_i$$

where β_0 is the intercept term. β_1 are coefficients from a vector of indicators for the race/ethnic groups defined in Table 1; β_2 is a series of indicators for gender, including an indicator for gender unknown; β_3 and β_4 are dichotomous variables marking first-generation and economically disadvantaged status; β_5 are indicators for each educational goal; β_6 are categories for high school GPA, including a category for no GPA available; and β_7 - β_9 are dichotomous indicators of participation in EOPS, learning communities, and Summer Bridge. β_{10} is a continuous measure of the total number of units assigned in the first-year SEP. In this model, the reference groups are: Hispanic/Latino/a/x, female, first-generation, economically disadvantaged, educational goal of degree+transfer, high school GPA 3.5 or higher, participant in EOPS, participant in learning communities, and participant in Summer Bridge.

Chapter Five: Results

In this chapter, I review the results from my analysis. For each research question, I first present summary statistics for the study variables. For research questions 1 and 2, addressing SEP participation, I first describe the demographic characteristics, academic information, and success program participation for students who met the criteria for inclusion in the study, and SEP participation rates for the entire sample as well as for each subgroup (student socioeconomic

characteristics, academic information, and participation in student success programs offered by the college). I then examine whether SEP participation rates are related to subgroup membership.

SEP Participation

Study Variable Summary Statistics

Table 2 provides the descriptive and summary statistics for the SEP participation portion of this study. Column 1 presents the total number of first-time, degree-seeking students attending the college in Fall 2017, 2018 and 2019 semesters included in the study sample and the numbers broken down but each demographic, socioeconomic, and academic subgroup. Column 2 shows the proportion in each subgroup, displayed as column percentages. Overall, there were 1,142 students who met the criteria for inclusion in the study (first-time, degree-seeking students in fall semesters 2017 through 2019).

Demographic variables. Among these students, the largest proportion identified as Hispanic/Latino/a/x (45%), followed by White (35%), Asian (7%), multiracial (5%), and Black or African-American (4%). Race/ethnicity was unreported for 3%. Fifty-four percent were male, 45% were female, and 2% reported "other" gender or did not report their gender.

Socioeconomic variables. Fifty-three percent were economically disadvantaged at the semester of first enrollment, and 35% were first-generation students.

Academic predictors. The majority (63%) had declared an educational goal to "obtain an associate degree and transfer to a 4-year institution," and 25% had a goal of transfer only, and 12% had a goal of earning an associate degree without transfer. Mean self-reported high school GPA was 2.93. The breakdown of GPA into categories is as follows: 4% had a GPA less than or equal to 2.0; 19%, 2.0-2.49; 28%, 2.5-2.99; 24%, 3.0-3.49; 13%; 3.5 or higher; and 11% did not report a high school GPA.

Program participation predictors. Participation in student success/retention programs at the first semester of enrollment was as follows: 13% were EOPS students, 10% participated in a learning community, and 20% had participated in Summer Bridge the summer prior to their first fall semester.

Table 2. SEP Participation: Study Variable Summary Statistics

Variable Name	All First-Time Degree-Seeking Students	Percent of First Time Degree-Seeking Students	Students with SEP at First Enrollment
Total	**1,142**	**100**	**704**
Race/Ethnicity			
Asian or Pacific Islander	81	7	51
Black or African American	48	4	36
Hispanic	515	45	300
Two or more races	62	5	40
White	402	35	259
Other Race/Unknown/Unreported	33	3	18
Gender			
Female	509	45	334
Male	614	54	360
Unknown/Unreported	19	2	10
Economically Disadvantaged Status			
Economically disadvantaged	609	53	389
Not economically disadvantaged	533	47	315
First Generation Status			
First generation	396	35	242
Not first generation	653	57	405
Unknown or not applicable	91	8	55
Educational Goal			
Associate degree with transfer	717	63	458
Transfer only	290	25	168
Associate degree only	135	12	78
High School GPA			
<2.0	51	4	27
2.0-2.49	219	19	133
2.5-2.99	324	28	196
3.0-3.49	271	24	172
3.5 or higher	153	13	101
No high school GPA	124	11	75
EOPS Participation			
EOPS participant	144	13	101
Not an EOPS participant	998	87	603
Learning Community Participation			
Learning community participant	109	10	82
Not a learning community participant	1,033	90	622
Summer Bridge Participation			
Summer Bridge participant	224	20	138
Not a Summer Bridge participant	918	80	566

Research Questions 1 and 2

1) What proportion of first-time community college students have developed Student Educational Plans (SEPs) prior to their first semester of attendance?

2) Are students' demographic backgrounds, educational goals, and participation in student success programs related to development of Student Educational Plans?

For research question 1, I describe the rate of SEP participation among the total sample of students and for each of the study's subgroups. Research question 2 addresses whether differences in SEP participation rates among student subgroups described in research question 1 are statistically significant. The results are as follows. Results of the Bonferroni post-hoc comparisons are noted below only if statistically significant.

Table 3 displays the SEP participation rate for the overall study sample and for each demographic, socioeconomic, academic, and program participation subgroup, expressed as a percentage. Overall, 62% of students in the sample had developed an SEP prior to their first term of enrollment.

Demographic variables. Students identifying as Black or African-American had a relatively higher rate (75%) of SEP participation than those identifying as two or more races (65%), White (64%), Asian or Pacific Islander (63%), Hispanic/Latino/a/x (58%), and those who reported another race or did not report their race/ethnicity (55%). However, ANOVA revealed no significant between-groups difference in SEP participation for race/ethnicity ($F(5,1136) = 1.77$, $p = .12$). Female students participated at higher rates than male students (66% and 59%, respectively). The ANOVA result for gender was significant, with females more likely to participate than males ($F(2,1139) = 3.21$, $p = .04$).

Socioeconomic variables. The SEP participation rate among economically disadvantaged students was 64%, compared to 59% among those not classified as economically disadvantaged. The result for economically disadvantaged status was marginally significant ($F(1,1140) = 2.74$, $p = .097$), with economically disadvantaged students more likely to have developed an SEP. First-generation students, those whose parents have never attended college, had a 61% participation rate, comparable to non-first-generation students (62%). There was no significant difference by first-generation status ($F(3,1136) = .22$, $p = .89$).

Academic predictors. Students declaring a combined educational goal of obtaining an associate degree and transferring to a 4-year institution had a higher rate of SEP participation, 64%, than those whose goal was degree or transfer only (both 58%). There was no significant difference by educational goal ($F(2,1139) = 2.03$, $p = .13$). Among GPA categories, SEP participation was as follows: GPA less than or equal to 2.0, 53%; 2.0-2.49, 61%; 2.5-2.99, 60%; 3.0-3.49, 63%; 3.5 or higher, 66%; and among students who did not report a high school GPA, 60%. The ANOVA for high school GPA categories was not statistically significant ($F(5,1136) = .71$, $p = .61$). However, upon examination of mean SEP participation rates for high school GPA categories, there does appear to be a linear pattern of higher participation as GPA increases. Figure 2 shows the distribution of high school GPA categories for SEP participants and non-participants. SEP participants were more heavily distributed among students reporting a high school GPA of 3.0 or higher.

Program participation predictors. In terms of student success/retention programs, 70% of students who participated in EOPS and 75% of those in a learning community during their first semester had developed an SEP, compared to 60% who did not participate in these programs. However, students participating in the Summer Bridge program and those who did not

had the same SEP participation rate, 62%. EOPS participants were significantly more likely than nonparticipants to have developed an SEP ($F(1,1140) = 5.04$, $p = .03$) as were learning community participants ($F(1,1140) = 9.46$, $p = .002$). Summer Bridge participants were equally likely as nonparticipants ($F(1,1140) = 0.0$, $p = .99$) to have developed an SEP.

Table 3. SEP Participation Rates

Variable Name	Students with SEP at First Enrollment	SEP Participation Rate (%)
Total	**704**	**62**
Race/Ethnicity		
Black or African American	36	75
Two or more races	40	65
White	259	64
Asian or Pacific Islander	51	63
Hispanic	300	58
Other Race/Unknown/Unreported	18	53
Gender		
Female	334	66
Male	360	59
Unknown/Unreported	10	53
Economically Disadvantaged Status		
Economically disadvantaged	389	64
Not economically disadvantaged	315	59
First Generation Status		
First generation	242	61
Not first generation	405	62
Unknown or not applicable	55	60
Educational Goal		
Associate degree with transfer	458	64
Transfer only	168	58
Associate degree only	78	58
High School GPA		
<2.0	27	53
2.0-2.49	133	61
2.5-2.99	196	60
3.0-3.49	172	63
3.5 or higher	101	66
No high school GPA	75	60
EOPS Participation		
EOPS participant	101	70
Not an EOPS participant	603	60
Learning Community Participation		
Learning community participant	82	75
Not a learning community participant	622	60
Summer Bridge Participation		
Summer Bridge participant	138	62
Not a Summer Bridge participant	566	62

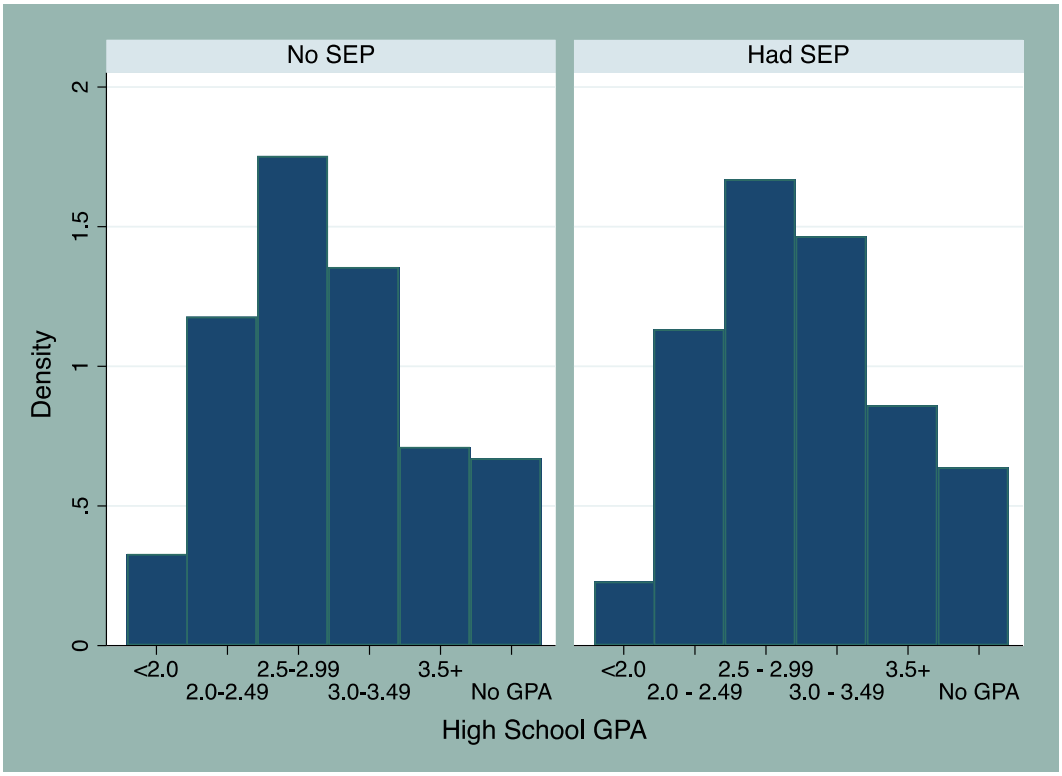

Figure 2. Distribution of High School GPA by SEP Participation

The ANOVA results provide little evidence beyond what we learn descriptively; that is, there is a statistically significant gap in SEP participation between males and females, but not among race/ethnicity groups. First-generation students are equally likely as non-first-generation students to participate, and economically disadvantaged students are more likely than non-economically disadvantaged students to participate. Participants in EOPS and learning communities are more likely than nonparticipants to develop an SEP. From a navigational capital perspective, we might expect SEP participation rates among traditionally underserved students and first-generation students to be lower than their counterparts; however, these results are in the opposite direction. The finding that economically disadvantaged students are more likely to have SEPs, and that EOPS and learning community participants are more likely to participate, may be a reflection of these targeted success/retention programs, which are designed in part to provide

extra matriculation support. Next I employ regression analysis to help disentangle the effects of these variables.

Table 4 shows the regression model results. The model constant (the mean participation of the reference group when controlling for all other factors in the model) is .527, or 53%.

Demographic variables. The model shows that controlling for all factors, compared to the reference group of students identifying as Hispanic/Latino/a/x, the probability of participation among White students is 12 percentage points higher (p = .004), and for Black/African-American students it's 13 percentage points higher, though that coefficient is marginally significant (p = .096). Controlling for other factors, males have a 7 percentage point lower probability of participation compared to females (p = .028).

Socioeconomic variables. There are no significant differences in probability of SEP participation associated with being first generation or economically disadvantaged, controlling for all other variables in the model.

Academic predictors. Controlling for all other variables in the model, educational goal and high school GPA are not significantly associated with SEP participation.

Program participation predictors. Participating in a learning community is associated with a 12 percentage point increase in the likelihood of SEP participation (p = .017). EOPS participation is associated with a 9 percentage point increase in SEP development, though the result is marginally significant (p = .059). There is no significant association between SEP development and participating in Summer Bridge, once all other variables are controlled for.

The R-squared statistic is .033, which means that 3% of the variance in participation is explained by the factors included in this model.

Table 4. Linear Probability Regression Results: SEP Participation, Coefficients from a Linear Probability Model (n=1,040)

Variable	Coefficient	Standard Error
Demographic Variables		
White	.114*	(.04)
Asian or Pacific Islander	.056	(.06)
Multi-Racial	.103	(.07)
Black or African American	.126~	(.08)
Other or Unknown Race/Ethnicity	-.004	(.09)
Male	-.067*	(.03)
Gender Unknown/Unreported	-.117	(.11)
Socioeconomic Variables		
Not First Generation	-.014	(.04)
First Generation Status Unknown/Not Applicable	-.126	(.16)
Economically Disadvantaged	.043	(.03)
Academic Predictors		
Degree only	-.047	(.03)
Transfer only	-.055	(.05)
High school GPA 2.0-2.49	.052	(.08)
High school GPA 2.5-2.99	.046	(.07)
High school GPA 3.0-3.49	.076	(.08)
High school GPA 3.5 or higher	.089	(.08)
No high school GPA Available	.036	(.08)
Program Participation Predictors		
EOPS Participant	.093~	(.05)
Learning Community Participant	.124*	(.05)
Summer Bridge	-.033	(.04)
Constant	.527*	(.08)
R-square statistic	.033	
Model degrees of freedom	20	
F-statistic	1.82	

*=p<.05, ~=p<.1, dependent variable: SEPPART

In summary, the results of the descriptive and ANOVA analysis showed no significant disparities in SEP participation among the groups I define as traditionally underserved; that is,

students identifying as Hispanic/Latino/a/x, Black or African-American, economically disadvantaged, and first-generation. Rather, I find significant differences in participation for students participating in success/retention programs, specifically EOPS and learning communities. Having a high school GPA and being female were also related to higher SEP participation. The regression results validated the independent association of being female, as well as participation in EOPS and learning communities, with increased likelihood of SEP development. The model also showed that controlling for other demographic factors, academic background, and participation in success/retention programs, socioeconomic factors--first-generation and economically disadvantaged status—are not associated with SEP participation. While initial analysis showed that economically disadvantaged students participated at a higher rate than non-disadvantaged students, this difference was likely a function of economically disadvantaged students' high participation in EOPS and learning communities, which were significant in the regression model. The regression model also diverged from the initial findings on GPA and race/ethnicity; when controlling for all other factors, high school GPA was not significantly related to SEP participation, and the model showed that Hispanic/Latino/a/x students were less likely than their White and African-American/Black peers to develop an SEP. Also, the initial analyses compared participation rates for each race/ethnicity group against all others, using a Bonferroni post-hoc correction to adjust for the multiple comparisons. The threshold for statistical significance in these comparisons was higher than the standard $p < 0.05$, and some of the groups were relatively small (for example, there were only 48 African-American/Black students in the analytic sample). If the post-hoc adjustment were not used, these differences may have been significant as well.

SEP Adherence

Research Question 3

To what extent do first time community college students adhere to their assigned Student Educational Plans during the first year of attendance?

In Research Question 3, I first describe the quantitative measures of SEP adherence for students' first year of enrollment; the number of units assigned in students SEPs, the number of those units students adhered to by enrolling in the assigned courses, and the number of enrolled units and courses outside the SEP. I then describe the variation in assigned SEPs at the student level, including the average SEP units assigned in the first year.

Study Variable Summary Statistics. Table 5 shows statistics describing the courses and units assigned and adhered to in students' SEPs, as well as the courses and units enrolled in outside of assigned SEPs. A total of 3,225 year 1 courses were assigned in SEPs; of those, students enrolled in 2,596 (80.5%). The average number of courses assigned per student was 7.8, and students adhered to an average 6.3 courses. The average number of units assigned per student was 25.8, and students adhered to an average of 20.8 units. Students enrolled in a total of 592 courses and 1,466 units not assigned in the first year of their SEP. The mean per student was 1.4 unassigned courses and 2.1 unassigned units.

Table 5. Study Variable Descriptive Statistics- Courses and Units Assigned and Adhered in Year 1

	All SEPs combined	Mean	SD	Median
SEP Courses Assigned	3,225	7.8	2.1	8
SEP Courses Adhered	2,596	6.3	2.4	6
SEP Units Assigned	10,644	25.8	6.2	27
SEP Units Adhered	8,566.5	20.8	7.6	22
Unassigned Courses Enrolled	592	1.4	1.7	1
Unassigned Units Enrolled	1,466	2.1	3.8	0

Table 6. Descriptive Statistics-Student-Level SEP Adherence

	N	Mean	SD	Median
All Students	413	79.9	21.4	85.1

SEP Adherence. Table 6 presents the descriptive statistics for SEP adherence. The mean overall adherence rate was high, at 79.9%, and the median was 85%, meaning that half of the students in the analytic sample adhered to 85% or more of their assigned courses. Considering that many students also took courses unassigned on their first-year SEPs that may still count toward their completion goal, overall these results suggest that students with SEPs stay largely on track to efficient completion. Figure 3 displays the cumulative distribution of SEP adherence rates. The largest proportion of students, 150 (36%), adhered to 100% of their assigned SEP units.

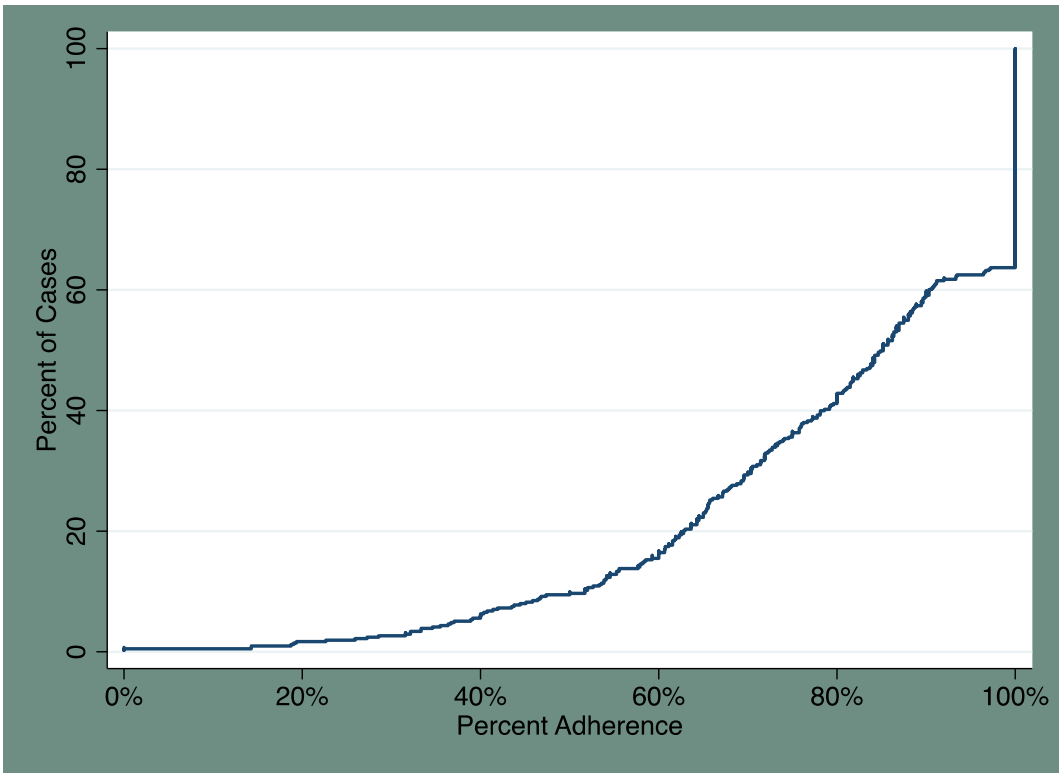

Figure 3. Cumulative Distribution of SEP Adherence

Students at the college in this study are considered full-time if they are enrolled in 12 units a semester. Therefore, the mean number of SEP units assigned, 25.8, indicates that on average, students were assigned a full-time unit load in their first-year SEPs. Of the 413 students in the analytic sample, 292 (71%) were assigned 24 or more units, a full-time course load. Figure 4 illustrates the distribution of SEPs according to the total number of first-year units assigned. The total number of SEP units assigned ranged from 3 to 43, and the large majority of SEPs in the analytic sample were between 22 and 32 units.

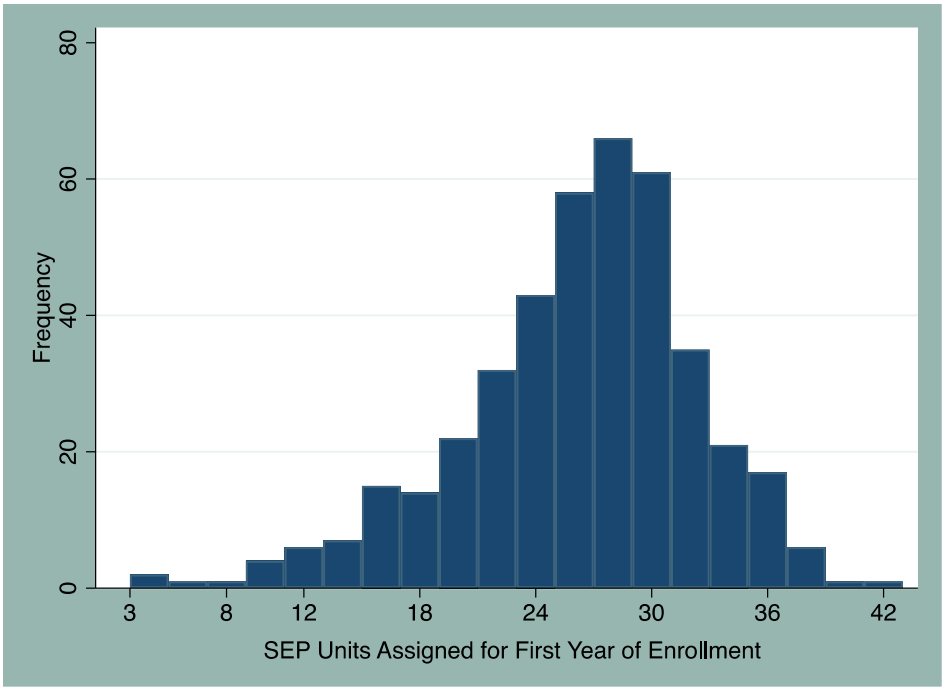

Figure 4. Distribution of SEP Units Assigned in the First Year of Enrollment

Adherence to Full-time and Part-time Assigned SEPs. I also examine the relationship between the first-year unit load assigned and adherence rate to determine whether the unit load assigned was related to adherence. Table 7 shows mean adherence by whether the SEP assigned full-time load (24 or more units per year) or part-time load (less than 24 units). Students assigned a part-time first-year unit load in their SEP adhered at a mean rate of 76.7%, and students with a full-time SEP adhered at 81.3%.

Table 7. Student Level Descriptive Statistics: SEP Adherence Rate in Year 1 by Full-Time and Part-Time SEP Assigned Unit Load

	N	Mean	SD	Median
All Students	413	79.9	21.4	85.1
Part-Time SEP Unit Load	121	76.7	19.4	81.8
Full-time SEP Unit Load	292	81.3	25.5	85.9

In the analytic sample for this study, the mean number of units per SEP course assigned was 3.3, and the median was 3. Not adhering to a course has a larger impact on the study's adherence measure for students assigned a lower course unit load. For example, a student assigned a half-time unit load of 12 units, who fails to adhere to one 3-unit course, will have an adherence rate of 75%, whereas a student with a full-time assigned unit load of 24 units who fails to adhere to the same course will have an adherence rate of 87%. Figure 5 displays the relationship between the number of SEP units assigned and adherence rate. An accompanying regression showed that there is a weak linear relationship between SEP units assigned and adherence rate ($p = .02$); therefore, the number of SEP units assigned is included as an independent control variable in the analysis for research question 4.

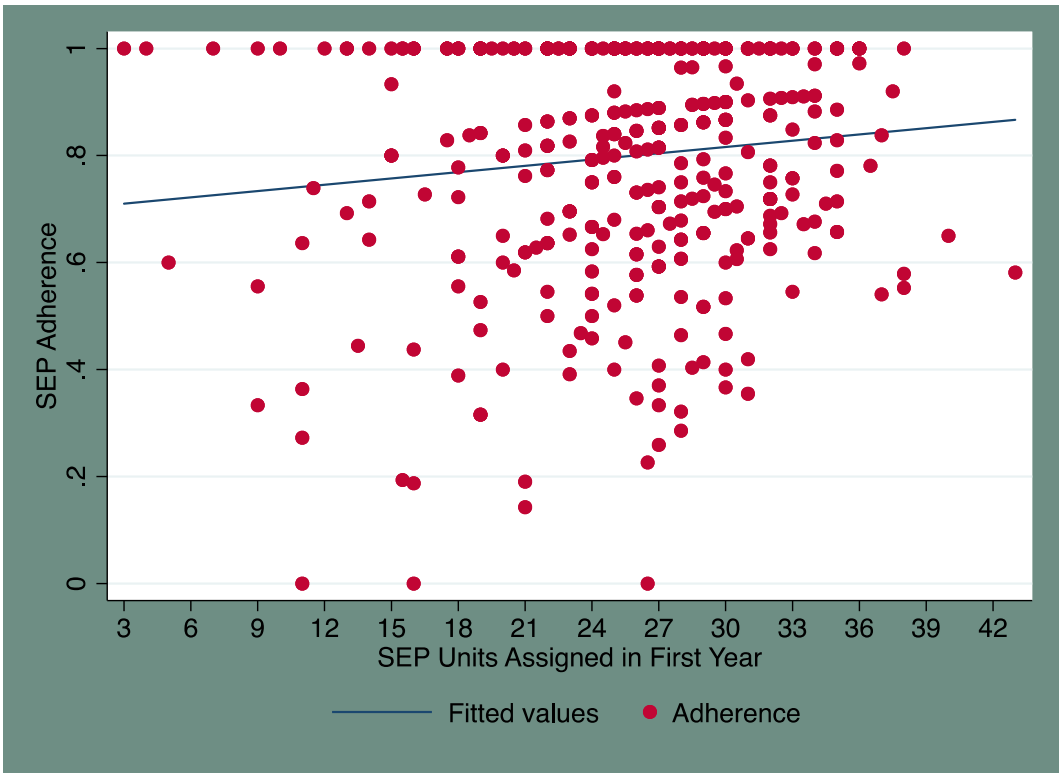

Figure 5. Adherence Rate by Number of Assigned SEP Units

Research Question 4

How are students' demographic backgrounds, educational goals, and participation in student success programs related to adherence to their Student Educational Plans?

To answer research question 4, I first describe adherence rates for each of the study's demographic and academic characteristics, and participation in success retention programs. I then employ oneway ANOVA models with Bonferroni post-hoc comparisons to determine whether there are significant mean differences in SEP adherence within subgroups of each category. Finally, I use OLS regression to examine whether underserved students experience disparate SEP adherence rates when controlling for academic characteristics and success/retention program participation. The results are as follows. Only significant results for

the Bonferroni post-hoc comparisons are noted. Table 8 displays the mean SEP adherence rates for the analytic sample and for each study subgroup, expressed as a percentage.

Demographic variables. Students identifying as Asian or Pacific Islander and those who reported another race or did not report their race/ethnicity had a relatively higher adherence rate (85%) as compared to Black or African-American (81%), Hispanic/Latino/a/x (80%), White (79%), and two or more races (65%). However, ANOVA revealed no significant between-groups differences in SEP adherence by race/ethnicity ($F(5,407)=.56$, $p=.73$). The adherence rate for both female and male students was 80% ($F(2,410)=1.76$, $p=.17$).

Socioeconomic variables. Economically disadvantaged and non-economically disadvantaged students adhered at the same rate, 80% ($F(1,411)=.22$, $p=.64$). Adherence among first-generation students was 77%, slightly lower than non-first generation students (81%), but the difference was not statistically significant ($F(2,409)=1.44$, $p=.24$).

Academic variables. Students with an education goal of AA/AS degree adhered at 83%, higher than those seeking degree and transfer (79%) and transfer only (78%), but the difference was not statistically significant ($F(2,410)=1.80$, $p=.17$). Among GPA categories, SEP adherence was as follows: GPA less than or equal to 2.0, 71%; 2.0-2.49, 80%; 2.5-2.99, 77%; 3.0-3.49, 84%; 3.5 or higher, 85%; and among students who did not report a high school GPA, 73%. The ANOVA model was statistically significant ($F(5,407)=3.53$, $p=.004$). Post-hoc tests showed adherence rates for students with no high school GPA available were significantly lower than for those with 3.5 or higher GPA ($p=.04$) and marginally significantly lower than those with GPA of 3.0-3.49 ($p=.073$).

Program participation. The most consistent differences were across program participants and non-participants. Adherence among EOPS students was 86%, significantly higher than non-

EOPS students (79%) ($F(1,411)=7.80$, $p=.006$). Learning community participants also adhered at a higher rate than non-participants (87% and 79%, respectively, $F(1,411)=5.29$, $p=.02$). Students participating in Summer Bridge adhered at 87%, significantly higher than non-participants (78%, $F(5,407)=9.71$, $p=.002$).

These initial findings on SEP adherence are similar to the initial findings on SEP participation, in that they do not reflect the differences we might expect to see if traditionally underserved and first-generation students indeed experienced disparities in navigational capital. Also similar to the findings on SEP participation, students participating in EOPS and learning communities, and in this case also students participating in Summer Bridge, adhered to their SEPs at significantly higher rates, suggesting that for traditionally underserved students, these programs may attend to any gaps in "college knowledge" that might otherwise impact SEP adherence. I next use regression analysis to help clarify the relationship between these factors and adherence.

Table 8. Mean SEP Adherence by Subgroup

Variable Name	All Students with SEPs	Mean Adherence	SD
Total	**413**	**.79**	**21.4**
Race/Ethnicity			
Asian or Pacific Islander	35	.85	.19
Other Race/Unknown/Unreported	8	.85	.21
Black or African American	18	.81	.17
Hispanic	173	.79	.22
White	153	.79	.22
Two or more races	26	.79	.20
Gender			
Female	203	.80	.22
Male	205	.80	.21
Unknown/Unreported	5	.62	.14
Economically Disadvantaged Status			
Economically disadvantaged	234	.80	.21
Not economically disadvantaged	179	.79	.23
First Generation Status			
First generation	138	.77	.23
Not first generation	238	.81	.20
Unknown or not applicable	36	.79	.24
Educational Goal			
Associate degree with transfer	267	.79	.22
Transfer only	104	.83	.19
Associate degree only	42	.78	.23
High School GPA			
<2.0	18	.71	.21
2.0-2.49	69	.80	.21
2.5-2.99	112	.77	.22
3.0-3.49	107	.84	.18
3.5 or higher	65	.85	.18
No high school GPA	42	.73	.29
EOPS Participation			
EOPS participant at first term	69	.86	.16
Not an EOPS participant	344	.79	.22
Learning Community Participation			
Learning community participant at first term	48	.87	.18
Not a learning community participant	365	.79	.22
Summer Bridge Participation			
Summer Bridge participant	77	.87	.16
Not a Summer Bridge participant	336	.78	.22

Table 9 shows the results of the OLS regression model using ADHERENCE as the dependent variable. The model constant (the mean adherence of the reference group when controlling for all other factors) is .71, or 71%.

Demographic variables. The model shows that controlling for all other variables, there is no significant difference in adherence between Hispanic/Latino/a/x students and any other race/ethnicity or between males and females.

Socioeconomic variables. Controlling for all other factors, there is no significant association between SEP adherence and economically disadvantaged status. Not being first-generation is associated with a 6 percentage point increase in adherence compared to first generation students (p = .028). This result diverges from the initial ANOVA analysis once the controls are added.

Academic variables. Having an educational goal of degree only is associated with a 4% increase in adherence compared to a goal of degree plus transfer, though the result is marginally significant (p =.08). In this model, I use high school GPA of 3.5 or higher as the reference group, as the number of students with <2.0 was small (n=18). Compared to this reference group, adherence is 7 percentage points lower among those with a GPA of 2.5-2.99, 13 percentage points lower for those with GPA <2.0, and 12 percentage points lower among those with no high school GPA available; all of these differences are significant at $p < 0.05$.

Program participation. In terms of participation in success/retention programs, participating in EOPS is associated with a 9 percentage point increase in adherence (p = .005); learning communities participation is associated with a 7 percentage point increase (p = .05); and Summer Bridge participation is associated with a 5 percentage point increase, though that result is only marginally significant once other factors are controlled for (p = .096).

Number of first-year SEP units assigned was included in this model as a control variable. The coefficient was marginally significant (p = .068), with a small effect of .03 percentage point increase in adherence for each additional unit assigned (the SEPs with the smallest number of units assigned consisted of 3 assigned units).

The R-squared statistic is 0.127, meaning that 13% of the variance in SEP adherence is explained by the factors included in this model.

Table 9. Regression Results: SEP Adherence, Coefficients from an OLS Model (n=413)

Variable	Coefficient	Standard Error
Demographic Variables		
White	-.01	(.03)
Asian or Pacific Islander	.03	(.04)
Multi-Racial	-.02	(.05)
Black or African American	.00	(.05)
Other or Unknown Race/Ethnicity	.04	(.08)
Male	-.01	(.02)
Gender Unknown/Unreported	-.18~	(.10)
Socioeconomic Variables		
Not First Generation	.06*	(.03)
First Generation Status Unknown/Not Applicable	.02	(.04)
Economically Disadvantaged	-.01	(.03)
Academic Predictors		
Degree only	.04~	(.03)
Transfer only	-.02	(.04)
3.0-3.49	-.02	(.03)
2.5-2.99	-.07*	(.03)
2.0-2.49	-.04	(.04)
<2.0	-.13*	(.06)
No high school GPA	-.12*	(.04)
Program Participation Predictors		
EOPS Participant	.09*	(.03)
Learning Community Participant	.07*	(.03)
Summer Bridge	.05~	(.03)
Units Assigned in SEP	.003~	
Constant	.71*	(.04)
R-square statistic	.127	
Model degrees of freedom	21	
F-statistic	2.70	

*=p<.05, ~=p<.1, dependent variable: ADHERENCE

There are several differences in the variables significantly related to SEP participation and SEP adherence, which is notable because we might expect the same factors to influence both

behaviors. However, two aspects of this study's design and analysis may explain why the models look so different. First, the analytic sample for the adherence model was much smaller than for the participation model, resulting in relatively small groups, meaning that the differences would have to be quite large for the model to yield statistically significant results; for example, there were only 18 African-American/Black students and 35 Asian/Pacific Islander students in the adherence model. Second, as students who did not persist to the spring semester were not included in the adherence model, the relationship between persistence and both SEP participation and adherence should be considered, and this was not part of the design and analysis plan for this study.

While the participation model showed that compared to White students, Hispanic/Latino/a/x students participated at lower rates and African-American/Black students participated at higher rates, the adherence model shows no significant relationship between race and adherence. Similarly, the participation model showed that males were significantly less likely than females to have an SEP, but the adherence rates for the two groups were comparable.

In terms of socioeconomic characteristics, being economically disadvantaged was not related to either SEP participation or adherence. First generation status was not related to participation, but first-generation students adhered to their SEPs at a significantly lower rate than non-first generation students.

High school GPA was not significant in the participation model, but students with higher high school GPA adhered to their plans at higher rates than those with lower GPA or no available GPA. Those who do not report high school GPA on their CCC application are almost entirely students 22 or older, many returning to college after years of not attending school. Those with lower high school GPA, or students returning after years away from school, may simply

struggle more with the demand of college-level courses, and end up dropping courses or delaying more challenging courses to stay afloat academically.

In the adherence model, students with an educational goal of "obtain a 2-year associate degree without transfer" adhered at higher rates than those with transfer included in their educational goal. This is likely because the college's associate degree programs not geared toward transfer typically have a more narrow path to graduation, with specific required courses within GE areas rather than lists to choose from; in other words, they have less opportunity to veer off track.

The one area where both models are consistent is participation in retention/success programs. These results are significant in the initial analyses and remain significant even when controlling for all other factors in the regression models. Students participating in EOPS and learning communities were significantly more likely to have an SEP and adhered at higher rates than non-participants; Summer Bridge participants also adhered to their SEPs at higher rates than non-participants. This supports the conclusion posited in the summary for the participation model: that these programs, which offer matriculation and ongoing counseling support to participants and are designed specifically to support traditionally underserved students, are having their intended impact and may be effectively narrowing equity gaps.

Research Question 5

Are there assigned courses and/or requirements listed in students' SEPs that have relatively high rates of nonadherence?

To answer research question 5, I first describe the courses and subject areas assigned in students' SEPs in which students most commonly fail to enroll. Then, I describe common

patterns of adherence noted in my review of individual SEPs, adding context to the descriptive measures.

As detailed in research question 3 (Table 5), students in the study's adherence analytic sample enrolled in 2,596 of the 3,225 courses assigned in their first-year SEPs. This leaves 629 assigned courses that students failed to adhere to during their first year. Table 10 lists the most common non-adhered courses, which I define as courses in which 10 or more students were assigned but did not enroll. There are 13 courses that meet this threshold. Combined, these missed course enrollments total 272, 43% of the 629 non-adhered course enrollments.

Table 10. SEP-Assigned Courses with Highest Number of Non-Adhered Enrollments

Course	N Assigned Not Enrolled	Percent of All Non-Adhered Courses
MATH 115 - Probability and Statistics	55	9%
ENGL150 - Reading and Composition (1A)	38	6%
ENGL151 - Reading and Composition (1B)	35	6%
BIOL110 - Introduction to Biology	20	3%
SOC110 - Introduction to Sociology	18	3%
COMM100 - Introduction to Communication & Speech	16	3%
BIOL110L - Introduction to Biology Laboratory	15	2%
MATH103 - Intermediate Algebra	15	2%
PSY110 - Introduction to Psychology	14	2%
ANTH101 - Introduction to Archaeology and Prehistory	13	2%
ENGL120 - Introduction to College Reading and Composition	11	2%
ENGL155 - Critical Thinking and Composition	11	2%
HUM101 - The Human Condition	11	2%
Total	**272**	**43%**

Table 11 shows the proportion of students in the adherence analytic sample who were assigned these 13 courses in their SEPs. Along with Figure 6, which shows the nonadherence rate for each course, these numbers show the relative magnitude of nonadherence for each course.

Table 11. Number and Percent of Students with Most Frequently Non-Adhered Courses in their SEPs

Course	N of SEPs with Assigned Course	Percent of SEPs with Assigned Course
ENGL150 - Reading and Composition (1A)	314	76%
MATH 115 - Probability and Statistics	189	46%
PSY110 - Introduction to Psychology	155	38%
MATH103 – Intermediate Algebra	129	31%
BIOL110 - Introduction to Biology	109	26%
ENGL151 - Reading and Composition (1B)	108	26%
BIOL110L - Introduction to Biology Laboratory	96	23%
HUM101 - The Human Condition	92	22%
SOC110 - Introduction to Sociology	72	17%
ENGL120 - Introduction to College Reading and Composition	67	16%
ANTH101 - Introduction to Archaeology and Prehistory	44	11%
ENGL155 - Critical Thinking and Composition	41	10%
COMM100 - Introduction to Communication & Speech	39	9%

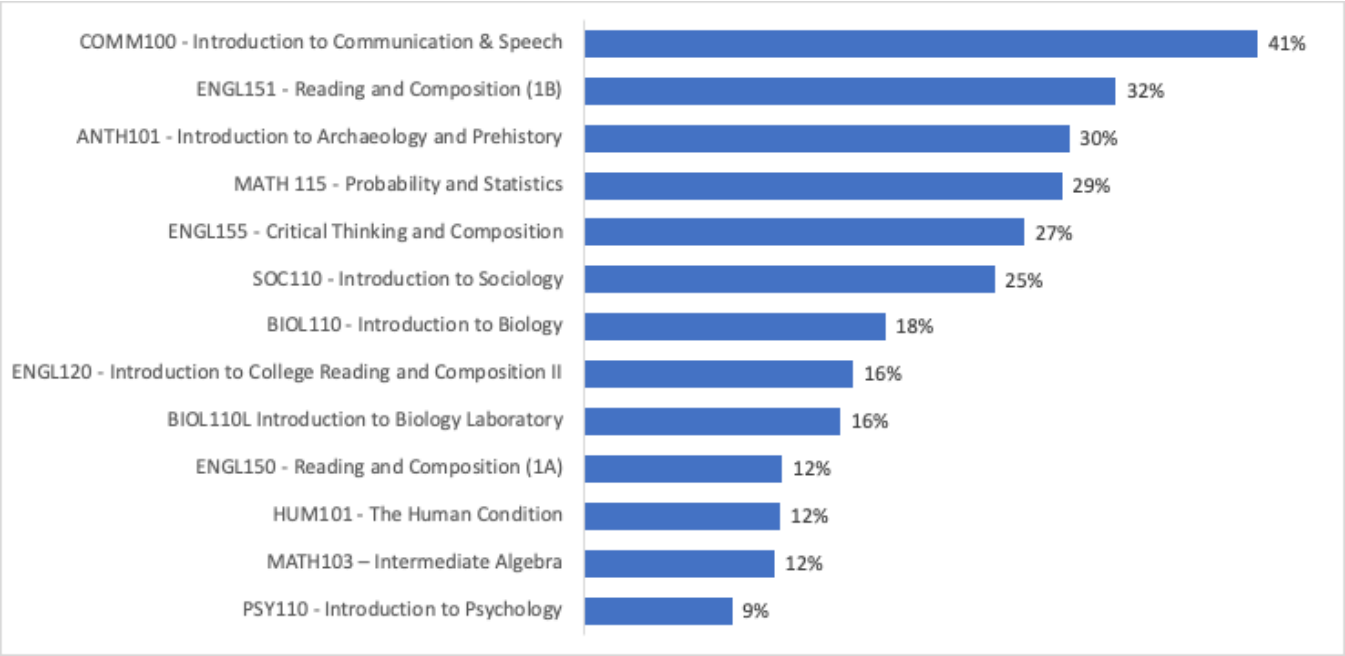

Figure 6. Nonadherence Rates for Specific SEP-Assigned Courses

Core Math and English requirements are assigned in the large majority of students' first year SEPs, yet comprise a substantial proportion of non-adhered courses. This is a major concern in terms of consequences for completion, as these courses serve as prerequisites for more advanced coursework in all student majors, and in these courses, students learn key analytical and writing skills essential for success in other core content courses.

Math 115, Probability and Statistics, is the transfer-level math course that all students pursuing a non-STEM (Business, Science, Technology, Engineering and Math) degree or transfer into a non-STEM major at a 4-year college must complete. This course was assigned in 46% of the SEPs, and accounts for 9% of all missed course enrollments. The rate of nonadherence was high, at 29%.

English 150 and 151 comprise the sequence of transfer-level English composition courses required to complete an associate degree and to transfer into California's CSU and UC systems. English 150 is the first course in the series. For the second course in the series, students may take English 155 in lieu of English 151. Together, these three courses account for 14% of the assigned, non-adhered course enrollments. English 150 is the course with the largest number of students assigned in their first-year SEPs (76%), but has a comparatively low nonadherence rate, 12%. English 151 is assigned in 26% of student SEPs, and has a much higher nonadherence rate, 32%. English 155 is less often assigned, to just 10% of students, but also has a relatively high nonadherence rate of 27%. Because students may substitute English 151 for 155 and vice versa, substitution may account for some of the nonadherence in these two courses, though the high nonadherence rate in both and relative low enrollment in English 155 suggest that students are delaying this second course sequence requirement. As it was beyond the scope of the analysis for this study, I did not code the data to reflect this potential offset. However, anecdotally, I noticed

few cases of 151/155 substitution in reviewing the individual SEPs and course-taking patterns in the data; students who did not adhere to the assigned course most often did not enroll in either English 151 or 155.

Math 103 and English 120 are both below-transfer level courses that students may choose to take in preparation for transfer-level courses. While AB705 legislation now prohibits the college from placing most students in these remedial courses, during the time period covered by this study, students were frequently assigned these courses in their SEPs. Nonadherence to these courses, which would be followed in the SEP with the transfer-level courses, can be interpreted similarly to nonadherence to the transfer-level courses, in that students are delaying enrollment in their assigned English and Math courses. Humanities 101 is a transfer-level course designed to prepare students for transfer-level English, though it does not meet the transfer-level English requirement. Students may be choosing to skip this course and take the transfer-level English course instead, or nonadherence could also reflect the pattern of students delaying taking English.

Biology 110, assigned in 26% of SEPs with a moderately high nonadherence rate of 18%, is an example of where students might fall off track by delaying Math enrollment. Biology 110 is regularly included in student SEPs to fulfill the GE requirement in natural science, and for science majors, is a prerequisite for other advanced science courses. At the time of this study, completion of Math 103 (Intermediate Algebra) or intermediate algebra in high school was a prerequisite for Biology 110. Students who had both courses assigned on their SEP would fall off track in both courses by not completing Math 103, and potentially become off-track for other science courses by not completing Biology 110.

Most of the other frequently non-adhered courses, including Sociology 110, Communications 110, Psychology 110, and Anthropology 101, are core courses in the general education (GE) pattern for associate degree completion at the study college and transfer to CSU/UC systems. These courses are often assigned and taken as GE area electives and some may be substituted with other courses in the area, depending upon the student's educational goal and major. However, some majors require specific courses within these areas, so relying on a course catalog that lists the courses within a required GE area and enrolling in one without guidance from a counselor is risky; the student may end up with units that are transferable but do not fulfill a specific degree or transfer requirement. In addition, these intro-level GE courses typically have high enrollment, and may be difficult to enroll in the desired course section if a student does not register for courses several weeks before the semester begins. For many community college students, who must work and juggle other responsibilities, availability to enroll in any offered course section is limited, so if the section at the time slot they need is full, they might not be able to enroll in that assigned course at all for that semester.

While some students may be unable to enroll in specific course sections due to time constraints, for most of the high-enrolled GE courses noted above, and particularly for the core gateway Math and English courses, nonadherence is not likely due to an overall lack of available seats. At the study college, enrollment is monitored and managed so that additional course sections for core Math and English courses are added if there are enough students on the waitlist for a specific course to justify adding an additional section. Depending upon availability of faculty, this is also the case for the other popular core GE courses discussed above. For some major-specific courses and course sequences, which typically have lower enrollment, a course may be offered in the fall or spring term only, or may fill up and not be available to all students

wishing to enroll. At some larger colleges in the CCC system, however, inability to enroll in required courses may be more common, and have a substantial impact on students' ability to adhere to their SEPs.

Patterns of Adherence. This study question primarily aims to quantitatively describe the most common areas where students fail to adhere to their first-year SEPs, which are detailed above. However, while reviewing and cleaning the data, I noted several distinct patterns of nonadherence, each with unique consequences for timely completion.

The first and most simple pattern is that a student will take some but not all of their assigned courses. In the case where missed courses are a prerequisite for other courses, or the first in a sequence, this can impact adherence to other courses as well. Similarly, if a student was assigned the first course in a sequence during their first term but delayed enrolling, they may not complete the sequence in one year according to their SEP; the first course in the sequence may not be offered during the spring semester, or may be required as a prerequisite for the second course or other assigned courses. The most common examples of this pattern are students who skip one or more English or Math courses in the first year. There are two transfer-level English courses required for degree and transfer, and depending upon the students major, at least one math course. Students who fail to adhere to their plans in these cases fall off-track to transfer or complete their degree in a timely manner.

Another pattern is that students will take an assigned course, but withdraw or fail that course, so that they have to repeat it, which usually causes the student to delay other courses on their plan, and therefore sends them off track to timely completion.

In some cases, students appeared to substitute one course for another that satisfies the same requirement (for example, English 151 and English 155), so technically they aren't

adhering to the course in their SEP but are still on track. In addition, there was some variation in the way some counselors note assigned courses and potential substitutions, so that a course that may count in one SEP but not specifically on another would be counted differently in terms of adherence. For example, some assign a GE area with several allowable courses, while others assign a specific course. Similarly, after meeting with students, some counselors specifically list Kinesiology and other electives in the student's SEP and others leave those units out, only including specific courses that meet degree/transfer requirements. In these cases, the consequence for nonadherence vary.

A specific analysis was not performed to quantify whether courses taken outside of those assigned in the SEP counted toward the students' educational goal and/or major, as it is beyond the scope of this study's analysis. However, while reviewing the data file to ensure accuracy of the matches between SEP assigned courses and course enrollments, it was clear that some of these extraneous course enrollments were assigned in students' SEPs to be completed after the first year of enrollment. In most of these cases, the student took that course in lieu of a course assigned for the first year in their SEP. Some, as described above, appear to have been taken in substitution for an assigned course in a specific GE area. More often, however, these courses were not on the students' SEP and appeared to fall largely within enrichment/personal interest areas (Music, Art, language courses, Kinesiology), or professional development (Computer Information Systems courses in Microsoft Word, for example). These courses carried an average unit load of 2.5, suggesting that students may be taking them to complete full-time unit load for financial aid eligibility, or simply took an interesting course with a unit burden less than a typical GE survey course, which range from 3 to 5 units. Many students also took courses, such as Psychology 110, that are regularly assigned in year 1 of the SEP as part of the GE transfer

pattern, but were not specifically assigned on that student's SEP. It is beyond the scope of this analysis to determine whether those courses would count as GE requirements and/or electives or why the students enrolled in them. Some students may be substituting courses from their SEP with others from the same GE subject areas that will transfer to the CSU and UC systems and may also count toward their degree. However, some majors require specific courses within GE subject areas to be taken, leaving little or no room for electives. Students with these majors who choose electives from within these areas that deviate from their SEP, even if the units are transferable, may not meet major-specific degree/transfer requirements and still result in acquiring superfluous units. Students may not realize which of these elective courses count and do not count toward their specific majors without meeting with a counselor. The challenge in determining whether these units count toward the students' completion goal without duplicating requirements met from other courses is indicative of how complicated it remains, even under Guided Pathways reform, to navigate these requirements within the CCC system.

Chapter Summary

In summary, through my five research questions, I examine SEP participation and adherence across demographic and socioeconomic characteristics, high school GPA, educational goal, and participation in success/retention programs.

My first two research questions address rates of SEP participation among first-time, degree and transfer seeking community college students. This analysis showed that SEP participation among first time students was 62%, with Hispanic/Latino/a/x students, males, and those not participating in success/retention programs participating at lower rates than their counterparts. The analysis did not show participation gaps among first-generation and economically disadvantaged students, as might be expected given the "college knowledge"

necessary to navigate the matriculation process in the CCC system, which includes SEP development. The finding that students in learning communities and EOPS programs are significantly more likely than non-participants to have developed an SEP prior to their first semester suggests that these success/retention programs may be obviating potential participation gaps among traditionally underserved students through matriculation support activities.

My second two research questions examine SEP adherence across the same demographic, socioeconomic, academic and program participation variables in research questions 1 and 2. This analysis revealed a high SEP adherence rate of 79%, with 36% of students adhering at 100%. Regression analysis revealed that first-generation students, those with an educational goal that includes transfer, those with lower high school GPA, and those not participating in success/retention programs adhered at lower rates than their peers. The lower adherence rate among first-generation students, even when controlling for participation in student success/retention programs, is an area that should be investigated through further research to determine what patterns of nonadherence may be prevalent among these students; for example, if enrolling and completing required first-year English courses is a particular barrier to this group. The positive finding in this analysis is that similar to the SEP participation results, I find that participation in retention/success programs is also significantly associated with higher SEP adherence.

In summary, I find that some disparities in SEP participation and adherence among underserved groups remain, but efforts to address these gaps through retention/success programs with strong matriculation support appear to be succeeding for those who participate. In addition, examining common patterns of nonadherence, I find that failure to enroll in first-year required

English and Math courses accounts for a substantial proportion of nonadherence, potentially derailing students from their completion goals.

Chapter Six: Discussion and Conclusions

Study Summary

Nationally, community college completion rates have been persistently and troublingly low. According to a 2017 report by the American Association of Community Colleges, just 39.3% of first-time community college students will complete a 2-year associate degree or 4-year bachelor degree within 6 years. In the California Community College system, fewer than half of first-time degree-seeking students achieve their completion goal of 2-year degree or transfer to a 4-year institution within 6 years (California Community Colleges Chancellor's Office, 2018). Traditionally underserved students, including economically disadvantaged, African-American/Black, and Hispanic/Latino/a/x students, have disproportionately low completion rates within the system (Chancellor's Office, 2018). In response to these numbers, educational policy makers nationwide and in California have embarked upon an aggressive completion agenda aimed at improving overall completion rates and eliminating equity gaps.

In 2012, the California State Legislature passed the Seymour Campbell Student Success Act, mandating colleges in the CCC system to make every reasonable effort to develop Student Education Plans with first-time, degree/transfer-seeking students. This mandate was predicated on the logic that with a clear list of courses to complete their educational goals within their selected majors, students would complete more efficiently and be less likely to become discouraged by slow progress and/or unnecessary unit accumulation, and consequently drop out. Even with SEPs, however, navigating the complex array of majors, course requirements, and

offerings is complicated, and students are heavily reliant on overburdened counselors to help them stay on track. In 2017, the system additionally adopted a Guided Pathways initiative, based on the structured choice hypotheses, which posits that streamlining degree and transfer pathways by offering fewer choices will reduce the confusion students face and improve efficient completion.

Even with Guided Pathways in place to facilitate timely completion, first-time degree/transfer seeking students still must develop an SEP with a counselor prior to enrolling and adhere to the assigned courses in the SEP. Students are expected to initiate this process, requiring navigational capital or "college knowledge" to which traditionally underserved students, particularly first-generation students, may enjoy less access than their peers. Little research has been done to determine the actual extent of participation in SEPs or whether students who develop SEPs actually follow their assigned plans. This study uses quantitative methods to examine the following research questions:

1. What proportion of first-time community college students have developed Student Educational Plans (SEPs) prior to their first semester of attendance?
2. Are students' demographic backgrounds, educational goals, and participation in student success programs related to development of Student Educational Plans?
3. To what extent do first time community college students adhere to their assigned Student Educational Plans during the first year of attendance?
4. How are students' demographic backgrounds, educational goals, and participation in student success programs related to adherence to their Student Educational Plans?

5. Are there assigned courses and/or requirements listed in students' SEPs that have relatively high rates of nonadherence?

This study was undertaken to examine the workings of a key component of student matriculation and completion in the California Community College system, Student Educational Plans. Do first-time students, particularly traditionally underserved students, take the initiative to develop SEPs prior to enrollment? And do these students actually adhere to their plans once they are assigned? These questions are important given the assumption that SEPs increase efficient completion and reduce equity gaps, especially among underserved students. The findings for each of my research questions provided some insight into these questions, and specifically insight into key areas of practice at the study college and how these practices may be translating into outcomes for students.

Key Findings

As discussed in the previous chapter, the SEP participation among first-time students, 62%, was fairly low, given the 2012 Student Success Act mandate and the study college's efforts to support incoming students through the matriculation process. Findings for research question 2 suggest an equity gap in SEP participation among students identifying as Hispanic/Latino/a/x students and their White, Asian and Black/African-American peers. The reasons for this are unclear. The study college has experienced a large increase in the number of Hispanic/Latino/a/x students in the past decade, and has implemented a methodical, scaffolded approach to student support and matriculation services, including dual enrollment partnerships with the local high schools, EOPS, a Summer Bridge program for incoming students, and first-year learning communities designed to help students navigate the matriculation process, including major and educational goal selection, transfer plans, and study skills. These support programs work closely

with other county partners and high schools with large populations of historically underrepresented students to provide such services. The regression results indicate that students who do participate in the learning communities are more likely to develop SEPs, suggesting that these services are successful in helping students as intended. However, the equity gap between Latino/a/x students and other groups remains even when controlling for learning community support. In addition, the regression analysis shows a large equity gap between male and female students in terms of SEP development, with males far less likely than females to have developed an SEP. This finding reflects counseling literature finding that male students are less likely to seek guidance and support (Bryan, Holcomb-McCoy, Moore-Thomas, & Day-Vines, 2009; Pérez-Gualdrón, Yeh, & Russell, 2016).

While SEP participation rates were relatively low, research question 3 shows that students who persist to their second term and have an SEP in place for that term adhere at an average rate of 79.9%. This suggests that low SEP participation and attrition are barriers to timely completion, and nonadherence may be less of a problem.

A major insight resulting from this study's findings is that a substantial proportion of nonadherence is in required Math and English courses. This not particularly surprising given previous research demonstrating that completing of Math and English are major barriers to transfer for students in the CCC system (Cooper, Fong, Karandjeff, Kretz, Nguyen, Purnell-Mack, & Schiorring, 2017). In 2017, as part of the Vision for Success, the CCC system incorporated completion of both requirements as an accountability metric for its colleges. In addition, AB705 has essentially eliminated remedial Math and English, with the explicit goal of getting more students through transfer-level Math and English in the first year of enrollment. Yet, these findings show that even students assigned these transfer-level courses in their first

year are delaying taking them. Table 12 shows that systemwide, just 19% of first-time, degree-seeking students completed both transfer-level Math and English during the years this study examines.[4] At the study college, this number was slightly lower, at 18%. Looking across the demographic and socioeconomic characteristics parallel to those I used in this study, there are clearly disparities in completion of this milestone at the study college for Latino/a/x students, females, and first-generation students. With the exception of gender, these disparities are also reflected systemwide.

[4] Source: Student Success Metrics dashboard, California Community Colleges Chancellor's Office. Retrieved from: https://www.calpassplus.org/LaunchBoard/Student-Success-Metrics

Table 12. Percent of Degree-Seeking Students Completing Transfer-Level Math and English in the First Year of Enrollment, 2017-2019

	Study College	Statewide
Total	**18.2%**	**19.3%**
Race/Ethnicity		
Asian	27.6%	28.9%
Hispanic	14.2%	16.7%
Two or More Races	27.5%	21.7%
White	21.3%	22.4%
Gender		
Female	16.6%	19.5%
Male	19.8%	19.2%
First Generation Status		
First Generation Student	13.9%	15.5%
Not First Generation Student	21.0%	23.4%
Unknown/Unreported	20.9%	17.0%
Economically Disadvantaged Indicators		
Eligible for a College Promise Grant/BOG Waiver	18.2%	18.2%
Not Eligible for a College Promise Grant/BOG Waiver	18.1%	20.9%
Never Received Pell Grant	18.0%	18.9%
Received Pell Grant	18.9%	20.0%
Not Perkins Economically Disadvantaged	18.5%	21.4%
Perkins Economically Disadvantaged	17.8%	18.2%

Note: Values for small cell sizes, including for African-American/Black students, were masked so unavailable for disaggregation.

Implications for Policy and Practice

In its adoption and implementation of Guided Pathways, the CCC system has invested heavily in the idea that streamlining degree and transfer pathways will result in increased and more efficient completion for its more than 2 million students. Guided Pathways is designed based on four principles, or "pillars:" 1) Clarifying pathways to student completion goals; 2) Helping students choose and enter a pathway; 3) Helping students stay on the pathway; and 4) Ensuring students are learning.

Promoting SEP development is intended to help colleges to succeed in implementing pillar 2, “Helping students choose and enter a pathway.” Specifically, under Guided Pathways, student educational plans are considered essential in directing students toward a goal and understanding how to achieve it: “When students have a clear path to achieving their goal, they are able to see themselves completing in a realistic way, which in turn, keeps them motivated. Students are more willing to take the steps necessary when they can see how those steps lead them to their goals” (RP Group, 2017). This study’s findings, that just 62% of first-time, degree-seeking students have developed an SEP, indicate that the study college is falling short in this effort.

SEP adherence is a key factor for colleges to succeed in implementing pillar 3, “Helping students stay on the pathway.” Specifically, this pillar is intended to keep students focused on their completion goal by offering ongoing student support and helping them track their progress: “Students feel more motivated to continue if they can track and see the progress they are making towards their goals and how close they are to achieving those goals” (RP group, 2017). This study’s findings show a relatively high average adherence rate among students with SEPs, particularly among students participating in success/retention programs. However, the finding that first-generation students have lower adherences rates, even when controlling for program participation, indicates there is more work to do to ensure that all students have access to the support they need, including ongoing guidance from counselors.

Finally, a primary goal of Guided Pathways is to eliminate equity gaps in success and completion among traditionally underserved students. A key component of pathways is integration with college support systems. In this sense, based on the findings of this study, the college demonstrates success in that both participation and adherence are consistently higher

among students participating in success/retention programs (EOPS, Summer Bridge, and learning communities such as UMOJA and Puente), and while some equity gaps remain, they are not as pronounced as we might expect to see from a navigational capital perspective. However, the challenge remains to ensure that all students, not just those in formal support programs, enjoy access to the support they need to complete their goals.

Recommendations for Practice

Based on the findings of this study and put into the context of systemwide policies, namely Guided Pathways, I make four main recommendations, summarized below.

Recommendation #1: Enact registration and matriculation processes that ensure more first-time students have developed an SEP. While substantial efforts have been made to guide students through the matriculation process and encourage SEP development, the participation rates in this study indicate that more needs to be done to ensure all students have an SEP. One example is to require that students have an SEP prior to being able to register in courses, though efforts to ensure that this does not create undue barriers to enrollment, and especially disproportionate impact among traditionally underserved students, would be crucial. Another, more gentle approach, would be for counselors to contact students individually or create automatic invitations for counseling appointments so students do not have to initiate the process. It should be acknowledged that most proactive solutions to increasing SEP participation would require additional resources to implement; colleges do the best they can with the resources they have, and many potential solutions require more intrusive interventions from already-overburdened counselors.

Recommendation #2: Focus on completion of required Math and English. This recommendation is key to achieving higher completion rates, and successful strategies would

eliminate a large proportion of SEP nonadherence. As stated above, completion of Math and English in the first year of enrollment is a key success metric systemwide, and policies such as AB705 have already been put into place to achieve this goal. However, at the college level, more proactive counseling, nudging, and increased student support for students who elect not to participate in learning communities or other success programs with English and Math enrollment built in might make a difference. Ultimately, students are not required to enroll in any particular course, so an effective solution would have to entail more "carrot" than "stick."

Recommendation #3: Continue utilizing student support programs in efforts to keep students on track. A key finding in this study is that student success/retention programs make a difference in SEP participation and adherence for those who participate. Efforts to "scale up" these programs and make them more proactive could benefit students who currently do not participate in formal programs. This could include specific outreach and activities tailored to groups of students who might have lower participation in success programs, such as older, returning students, working parents, and major-specific groups.

Recommendation #4: Develop better systems for tracking SEP adherence and notifying students when they're off track. This recommendation is primarily a technical one. Currently, programs such as DegreeWorks allow counselors to create SEPs with students and are integrated into students' online college portals, displaying their SEP if they've developed one. However, many colleges, especially small community colleges, do not have integrated data systems that can link to actual registration records with SEP-assigned courses in DegreeWorks and allow tracking of adherence to specific courses. The CCC system could take the lead on this effort, particularly since many students take courses form more than one community college and individual colleges struggle to track whether students are completing requirements elsewhere.

Theoretically, with an integrated system in place, colleges could be much more proactive in getting students to enroll in assigned courses, such as generating automated individual schedules based on the course offerings each semester and even automatically enrolling students in their assigned courses.

Study Limitations

A primary limitation of this research study is that the quantitative analysis was limited to the data available in the study college's systems. Though I was able to control for participation in academic and success/retention programs, and high school GPA as a proxy for academic motivation, the data does not include qualitative factors that may influence students' decision and/or ability to develop an SEP with a counselor and choose courses in adherence with their assigned SEP. This includes things like student conscientiousness, external responsibilities, work schedule, and access to transportation.

As stated in Chapter 5, the analytic sample for the adherence model in this study was much smaller than for the participation model, resulting in relatively small groups, meaning that the differences would have to be quite large for the model to yield statistically significant results; for example, there were only 18 African-American/Black students and 35 Asian/Pacific Islander students in the adherence model. Second, as students who did not persist to the spring semester were not included in the adherence model, the relationship between persistence and both SEP participation and adherence should be considered, but was not part of the analysis plan in this study.

Another limitation was the quality of the data. Individual counselors develop SEPs with their students in different ways, and the DegreeWorks program they use is not intended to capture data in aggregate for use in quantitative analysis. In reviewing the individual SEPs and

matched enrollments, it was clear there was considerable variation in the way individual counselors assigned courses and noted such assignments, and the analysis did not control for counselor effect.

Finally, given the specific nature of the data at the study college, the policies and matriculation support in place at that college, and the sample size, the results of this study are not generalizable to other community colleges or the CCC system, though the results are still useful to practitioners at those colleges to examine their own practices.

Future Research

This study was intended to be an initial look at whether SEPs are serving their intended purpose at the study college and to inform practice. The findings lead to three primary areas of future research.

First, I recommend research on the long-term outcomes related to SEP participation and adherence, including completion, time to degree/transfer, and excess accumulated units. This study is intended as a preliminary examination of development and adherence, and further research would shed light on how important these behaviors are for long-term student success.

Second, future research should take a deeper look at specific patterns of nonadherence and their consequences for completion. Such studies could help counselors steer students away from common pitfalls in course-taking decisions that are particularly consequential for completion, or mistakes from which students are unlikely to recover.

Finally, I recommend research that answers the "why" of nonparticipation and nonadherence. For example, this analysis showed that students with lower high school GPA and no available GPA (typically older, returning students) are less likely to adhere to their SEPs. As I

posited previously, this could be because they struggle more with the academic demand of college-level work and end up dropping courses or delaying courses they feel are too challenging. A deeper examination of adherence patterns could pinpoint where these students may be going off track and adapt practices in SEP development and tracking, to support these students through completion. In addition, an analysis of how course availability may constrain students' ability to adhere to their SEPs, and whether this results in equity gaps, would also be important in understanding SEP adherence.

In Conclusion

Student Education Plans are intended to provide direction and support for community college students, particularly historically underserved students, to efficiently complete coursework and achieve their educational goals. While there is much work to be done to examine how SEPs contribute to student success and completion and where implementation can be improved, this analysis helps to provide initial insight about participation in, and adherence to, SEP plans that can help inform current practice and future work.

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