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Latinx Student Experiences With
Assessment and Placement at Community College

By

ELIZABETH FLORES
DISSERTATION

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Approved:

Patricia D. Quijada (Chair)

Michal Kurlaender

Paco Martorell

Committee in Charge

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Abstract

Community colleges have been seen as a gateway into higher education and social mobility. Matriculation of students into higher education has been critical to guiding and directing the rest of their experience as a student. Not many scholars have examined the experiences of students with assessment and placement during matriculation at community college. There remains a dearth of literature regarding the experiences of Latinx community college students in particular. This dissertation presents an in-depth examination of the experiences of Latinx students with assessment and placement at a California community college. This study was conducted when standardized placement testing was the most common way of assessing students' mathematics skills.

Further, this research was undertaken before introducing changes to assessment and placement due to AB 705's multiple measures policy implementation in the fall of 2019. Latinx student experiences with standardized placement testing were shaped by institutional barriers to course enrollment, determined mathematics proficiency that was not reflective of their perceived breadth of skills, and a varying reliance on unsound placement tests. Findings and implications apply to states that continue to use standardized placement testing and those that have moved to use multiple measures.

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Chapter 1: Introduction

Community colleges enroll almost half (approximately 45%) of all undergraduates in the U.S. (American Association of Community Colleges [AACCC], 2016). Although 80% of newly enrolled community college students in the U.S. intend to transfer to a four-year college, only 25% transfer within five years (Jenkins & Fink, 2015). California has the largest community college system and serves one out of every five community college students (about 2.1 million) in the U.S (California Community Colleges Chancellor's Office [CCCCO], 2016a). Notably, the California community college (CCC) system's transfer rate falls slightly below the national average to 19% within four years (Johnson & Cuellar Mejia, 2020).

Latinx students are more likely to enroll in community college than any other racial or ethnic group, as compared to Whites and African Americans (Kurlaender, 2006). Latinx students comprise the largest racial or ethnic group enrolled in the CCC system (CCCCO, 2017a). This study examined one key aspect of the transfer journey, the experience of Latinx community college students through assessment and placement (A & P) at the point of matriculation. A & P is meant to appraise student's academic skills in English and mathematics and sort them into coursework. Students are then categorized and assigned to classes designated as transfer-level or developmental education. The Seymour-Campbell Student Success Act of 2012 (SB 1456, Lowenthal) states that "assessment instruments shall be used as an advisory tool to assist students in the selection of appropriate courses" (California Legislature, 2012). The Seymour-Campbell Student Success Act of 2012 is important because its intent was to increase student completion rates by revising matriculation, particularly to centralize A & P for the entire system by creating a single standardized examination. Though the common assessment was abandoned,

A & P continued. Students of Color, including Latinx, were disproportionately placed into developmental education courses that did not earn transfer-credit (Kurlaender & Larsen, 2013).

In 2018, the Student Success Act of 2012's changes to the A & P component were superseded by the passing of AB 705 and its full implementation of multiple measures (MM) to assess student mathematics skills in the fall of 2019. This dissertation took place before implementing AB 705 and when it was time to end using one-time standardized examinations in California. This dissertation spanned the period of the summer of 2018 through the fall of 2019, which was the same period that A & P transitioned from standardized examinations to AB 705's MM in California. The most dramatic change AB 705 brought about was to end any use of developmental education, unless, CCCs could prove it necessary (California Legislature, 2017).

This dissertation documents the experiences of CCC students with the mathematics standardized placement test because they are less likely to finish the sequence of courses assigned than in English. This study can inform community colleges in states that continue to administer a placement test exclusively and the implementation of MM in California and across the country. The following research question guided this dissertation:

How do Latinx California community college students understand and experience assessment and placement policies and practices?

Importance of the Study

Three factors emphasize the importance of this study. First, California's socioeconomic success depends on community college students' transfer and degree completion (The Campaign for College Opportunity, 2015). Second, Latinx students are the largest proportion of enrollment at CCCs, and thus improving outcomes for this group will have a significant impact on the system's overall success rates. In the fall of 2015, Latinx students made up the majority (about

44%) of the CCC's full-time equivalent student enrollment (CCCCO, 2017a), with over a million Latinx students (CCCCO, 2017b) registered. Documenting Latinx student experiences with A & P provides insight into better understanding and serving the largest proportion of student enrollment at community colleges in California and nationally. Third, A & P is traditionally the first exit point along the postsecondary education pipeline for students, particularly Latinx (Solórzano, 2012; Stoup, 2015). After receiving A & P outcomes, most students, with Latinx being overrepresented, either never enroll in courses or are sorted into basic skills classes (Bailey et al., 2010), which means they are less likely to transfer (Adelman, 1998). This study examined the Latinx students' lived experiences with the first major exit point, A & P.

Context for the Study

This section provides a brief history of A & P at community college which provides a context for the study. A & P policies and practices have historically been a point of debate in postsecondary education. Mandated A & P lost support during the 1970s. However, educators and policymakers later demanded mandatory A & P due to low student academic success rates (Cohen & Brawer, 2008; Fonte, 1997). Until recently, community colleges across the U.S. have taken on the task of evaluating entering students' readiness for college-level coursework and sorting them into classes through A & P, expressly, by using standardized entrance examinations (Burdman, 2012; Hughes & Scott-Clayton, 2011; Prince, 2005).

By the late 1980s, about 90% of community colleges in the U.S. used a standardized examination as a part of their A & P policies and practices (Woods, 1985). In line with this trend, California passed the Seymour-Campbell Matriculation Act of 1986, which overhauled registration services at all CCCs and mandated A & P for every incoming student. Objections to A & P emerged soon after; by 1988, the California Community Colleges Chancellor's Office

(CCCCO) was sued by the Mexican American Legal Defense Fund (MALDEF). MALDEF claimed that requiring A & P before being admitted into a nursing program disproportionately impacted Students of Color, particularly Latinx students (Hughes & Scott-Clayton, 2011; Los Angeles Times, 1991). MALDEF argued that a one-time high-stakes assessment of skills had excluded Students of Color from enrolling in select coursework and barred them from achieving academic goals (Hughes & Scott-Clayton, 2011; Los Angeles Times, 1991). This lawsuit pointed to the use of standardized examinations alone as essentially impinging on the right to equal education for Latinx students.

In exchange for dismissing the lawsuit, the CCCCCO agreed to implement statewide A & P policies for all students and programs. The intention of the agreement was to combine a standardized test with a second measure of student academic performance (i.e., high school grade point average) to determine all students' academic skills (Hughes & Scott-Clayton, 2011; Los Angeles Times, 1991). The resulting A & P policies mandated the use of multiple measures (MM). However, it failed to gain traction among CCCs and was never fully implemented in practice. Instead, CCCs pivoted to using a single standardized examination, often called placement testing, as the primary vehicle for assigning all students into coursework (Cuellar Mejia et al., 2020, Hughes & Scott-Clayton, 2011; Safran & Visher, 2010).

By the beginning of the 21st century, concerns about student success and degree completion at community colleges once again led educators and legislators to examine and reform matriculation, including A & P. This time, the debate moved away from mandating A & P to a focus on the effectiveness of the test and the impact of subsequent course placement on students as they navigated the educational pipeline. In California, the previous policy was revised and renamed the Seymour-Campbell Success Act of 2012 (SB 1456), which called for a

single statewide-standardized examination to be administered to all 113 campuses, among other changes to matriculation (California Legislature, 2012).

At about the same time, tensions arose between the push for centralization of A & P and emerging studies suggesting that placement tests poorly predicted student success in college-level courses (Bailey et al., 2010; Belfield & Crosta, 2012; Scott-Clayton, 2012). States and institutions were at a crossroads in identifying and relying on research about A & P, which had mixed results, for instance, under-placement of students. The debate about A & P at community colleges was deeply divided. During the heat of this debate there were nearly 1.5 million assessments administered to students in the CCC system to sort them into college-level or developmental courses (CCCCO, 2017a). At the start of this dissertation study, California was moving away from standardized placement testing due to evidence that suggested it was inequitable for students. These changes were fueled by research studies that focused on the inappropriateness of commonly used high-stakes tests and their detrimental impact on student outcomes (Bailey et al., 2010; Scott-Clayton, 2012; Scott-Clayton et al., 2014).

By the time this study concluded the new A & P policy was AB 705, which was implemented in the fall of 2019 across California. On October 13, 2017, Governor Brown signed Assembly Bill 705 (Irwin), requiring all CCCs to use MM for A & P (Burks, 2017; The East County Californian, 2017). The new MM approach replaced CCCAssess and did not require and even discouraged CCCs from using standardized examinations as part of A & P. AB 705 required that all community colleges in California implement MM to assess students' English and mathematics skills and subsequently sort them into coursework using high school data by the fall of 2019 (California Legislature, 2017). As part of MM's policies, CCCs were expected to consider "one or more of the following: high school coursework, high school grades, and high

school grade point average” (CCCCO, 2018). The aim of requiring MM to determine students’ academic performance beyond the placement test score was to gain a more accurate appraisal of students’ academic preparation for course placement and success (CCCCO, 2015). MM was also meant to stop any CCC from sorting students into basic skills classes without first showing, based on research evidence, that the student was going to fail in college-level coursework (California Acceleration Project, 2021; California Legislature, 2017; Rodriguez et al., 2018). Most importantly, beyond establishing MM as the primary means of course placement, AB 705 intended to eliminate any use of developmental education enrollment unless CCCs could prove that students were “highly unlikely to succeed in transfer-level coursework in English and Mathematics” (California Legislature, 2017).

All CCCs who had not already rolled out MM policies that complied with the statewide mandate were required to do so starting in the fall of 2019. The most recent changes to A & P under MM showed initial success in increasing access to transfer-level courses and course completion for students, however, disparities among groups based on race and ethnicity remained (California Acceleration Project, 2021; Cuellar Mejia et al., 2020). While this dissertation documented the use of a single standardized examination for A & P, it also gathered initial insights about students’ knowledge and experience with the MM policies developed and administered at their campus before AB 705’s full implementation.

As will be discussed at length in the literature review chapter, there were three camps that research regarding A & P fit into. The three research areas were A & P student success, effectiveness, and educational equity. Each area of the literature was critical to understand because they presented A & P as a multi-faceted component of the community college experience for incoming students. One group of researchers examined A & P in terms of student

success rates by focusing on the proportion of students who transferred or enrolled in basic skills courses and addressed issues of accountability based on institutional or system-wide performance (Fisher, 2016; Moore & Shulock, 2010; Prince, 2005; Wassmer et al., 2004).

The second group of studies measured the effectiveness of A & P test instruments, policies, and practices in determining students' academic outcomes with mixed findings (Bailey et al., 2010; Belfield & Crosta, 2012; Foote, 1995; Hughes & Scott-Clayton, 2011; Melguizo et al., 2013a; Prince, 2005; Safran & Visher, 2010; Scott-Clayton, 2012; Scott-Clayton & Rodriguez, 2015).

A third and smaller set of studies focused on A & P as an educational equity imperative. In these studies, A & P was seen as the first entry (Bailey et al., 2005; Rhoades, 2012) and an exit point along the P-16 educational continuum, most often with a disproportionate impact for Students of Color when it came to developmental education enrollment and transfer rates (Astin & Oseguera, 2004; Burdman, 2012; Deil-Amen & Rosenbaum, 2002; Dowd, 2007; Gándara et al., 2012; Labaree, 1997; Rosenbaum, 2001; Turner, 2004). While the three research camps outlined above overlap. They each matched more closely with student success, effectiveness, or educational equity, which meant they were in conversation.

While A & P is often examined in terms of student success, effectiveness, and educational equity, there is a gap in the literature because only a handful of studies examine A & P through the lens of student experiences (Behringer, 2008; Safran & Visher, 2010; Venezia et al., 2010). Further, the studies that exist do not specifically center on the experience of Latinx students with A & P, which this dissertation examines in depth.

The remainder of this dissertation is organized into four chapters. The chapter that follows is a review of the literature regarding A & P, Latinx student demographics, and a

presentation of the theoretical framework that guides this study, namely, Critical Race Theory and Latinx Critical Race Theory. The subsequent chapter explains the methodology behind this dissertation, including semi-structured interviews and qualitative data analysis. The next chapter presents a discussion of the findings. The last chapter contextualizes and discusses the findings with the theoretical framework and includes future research directions.

Chapter 2: Literature Review and Theoretical Framework

Community colleges, also known as junior or two-year colleges, are viewed as vehicles for social mobility (Bailey et al., 2015). Founded as open access postsecondary institutions, the original purpose of community colleges was to provide students a space within local communities to complete the first two years of undergraduate coursework before applying for admission and transferring to a four-year college to complete a bachelor's degree (Dougherty, 1994; Fisher, 2016; The Master Plan Survey Team, 1960). Individuals with varying levels of academic preparation, socioeconomic status, and racial/ethnic background enrolled into community colleges without requiring approval by an admissions committee (Cohen & Brawer, 2008). Community colleges' purpose was corroded through what Brint and Karabel (1989) call the *vocalization* of community colleges, which focus on producing certificates and degrees to serve industry needs. Today, community colleges' mission is divided. Institutions are suffering from an identity crisis. The outcome is a disjointed system with scarce resources to facilitate student transfer (Bailey et al., 2015).

Students undergo the A & P process during matriculation and before registering for English and mathematics pre-requisite clearance courses. Generally, A & P is completed in two steps, by assessing the math/English skills of entering students and sorting them into developmental education coursework, contributing to depressed transfer rates (Solórzano, 2012). Nationally, student transfer rates from a community college to a four-year college hover dismally at about 25% (Jenkins & Fink, 2015). Until recently, the California Community College (CCC) system, the largest in the U.S. with 115 colleges and 2.1 million students (CCCCO, 2020), showed a similar rate of transfer at about a quarter (Sengupta & Jepsen, 2006), more recently

however, transfer rates have improved and nearly reached 38% (Community College League of California, 2018).

Low-income, first-generation college students, and Students of Color are the most likely to matriculate with the intent to transfer (Horn & Nevill, 2006). Regrettably, transfer rates are lower for CCCs with high rates of African American and Latinx student enrollment (Wassmer et al., 2003; 2004). For instance, Martinez-Wenzl & Marquez (2012) examined 51 community colleges located in the region of Southern California and found that campuses comprised mainly of African American and Latinx students had the lowest transfer rates within six years. Conversely, community colleges with the highest transfer rates were attended by a majority of White and Asian students.

Developmental Education

A & P is a two-step process that assesses students' skills which results in developmental education course placement for entering students. Developmental education may delay and/or derail students from transferring in two years. Developmental education, also known as basic skills and remedial education, refers to courses intended to provide academically underprepared students the opportunity to build requisite skills for success in mathematics and/or English college-level coursework (Acevedo-Gil et al., 2014; Bailey, 2009; Bailey et al., 2010; Hughes & Scott-Clayton, 2011; Rueda & Sokolowski, 2004; Scott-Clayton, 2011; Solórzano, 2012). Developmental education courses earn neither college nor transfer-level credit but cost the same per unit (Rodriguez et al., 2017). After completing the prescribed developmental education course sequence, students can access transfer-level classes that help meet transfer requirements for their major or complete college-level degree programs (e.g., most associate degrees) (Bailey et al., 2010).

Across the U.S., community college students enroll in at least one developmental education course at rates that fluctuate from 50 to as high as 90 percent of students (Bailey, 2009; Bailey et al., 2010; Grubb et al., 2011; Prince, 2005), with California coming in at a staggering rate of 80% of students enrolling in developmental education courses (Cuellar Mejia et al., 2016). Chronically high rates of developmental education enrollment signal a developmental education crisis where students are placed at a disadvantage from the beginning of postsecondary education. Students sorted into developmental education coursework, as a result of the A & P mechanism, are required to take from one to five extra classes, which can add anywhere from one term to nearly two-and-a-half years to their original two-year transfer plans, for a total of about four-and-a-half years at community college, or end their postsecondary journey (Bailey & Cho, 2010). A longer transfer timeline is possible if students do not pass every class in the developmental education sequence during the first attempt. Enrollment in a developmental education course sequence questions whether transfer from a community college is feasible (The Campaign for College Opportunity, 2015).

Developmental Education Outcomes

Though developmental education courses are meant to level up students' basic skills, they have a poor track record of meeting that goal. When comparing students' six-year persistence and attainment of a bachelor's degree at two and four-year colleges, research shows that only 16.8% of students sorted into developmental education courses at community college obtained a bachelor's degree within 6 years, compared to 55.1% of students at four-year colleges who also took remedial courses (Chen & Simone, 2016). When examining community colleges developmental education outcomes exclusively, studies find that students who are assigned to developmental education coursework are less likely to progress into college-level coursework

and/or transfer to a four-year college than peers who enroll in transfer-level courses from the beginning, which makes developmental education a prominent exit point (Acevedo-Gil et al., 2014; Adelman, 1998; Bailey, 2009; Bailey et al., 2010; Belfield & Crosta, 2012; Prince, 2005). Notably, existing studies primarily examine student outcomes and persistence in developmental education and into college-level classes. Even when these classes do not receive transfer-level credit, they are included because they indicate students' trajectory from developmental education to transfer.

Bailey, Jeong, and Cho (2010) found that two-thirds of students do not complete the developmental education course sequence required to take college-level courses, not because they fail, but because they pass a developmental education course and do not enroll in the next required class in the sequence. In effect, a pattern of passing a developmental education course and not enrolling in the next class shows that students enrolled in developmental education can succeed but face obstacles that prevent them from continuing along the developmental education sequence of courses. Additionally, Martorell and McFarlin (2011) found that developmental education had little effect on the academic outcomes of Texan students (e.g., completing a degree) who enrolled in one basic skills course. Boatman and Long's (2018) findings showed that developmental education had adverse effects for students who were deemed academically underprepared and enrolled in one course below college level in Tennessee. However, students who were academically underprepared and enrolled in lower developmental education sequence were positive in select subjects (Boatman & Long, 2018). In another study focusing on the Tennessee system, student outcomes were more favorable for students enrolled in a community college with redesigned developmental education than peers at non-redesigned campuses (Boatman, 2012). A third study of the Tennessee system examined developmental education

reform policies: 1) waiving college mathematics remediation for high school seniors completing a specially designed course and 2) a co-requisite course for first-year students, combining basic skills and college-level mathematics content (Kane et al., 2021). Researchers concluded that “remediation requirements are not a primary driver of low degree completion rates” (Kane et al., 2021, p. 1).

Racialized Developmental Education

Developmental education course enrollment rates are not created equal. A & P disproportionately places Students of Color into developmental education courses (Dowd, 2007). When broken down by race/ethnicity, 53% of White students, compared to 63% of Latinx students, are enrolled in developmental education (Vandal, 2016). In California, developmental education course placement disparities by race/ethnicity widen. The Campaign for College Opportunity (2015) found that 85% of Latinx students were assigned to basic skills courses while this rate dropped to 66% for Whites. Even when academic performance in high school is held equal Latinx students are still more likely than White peers to be sorted into developmental education (Kurlaender & Larsen, 2013). A similar study found that for Latinx students, over four-year, transfer-level mathematics or English course sequences were not completed at rates of 83% and 64%, respectively (Acevedo-Gil et al., 2014).

A & P could be one of the factors that foster educational disparities for students at community colleges. The evidence reviewed above shows developmental education contributes to low transfer rates. A & P could be one of the factors that foster educational disparities for students at community colleges. In response to this evidence, this study focuses on mathematics developmental education course placement because students are less likely to complete the mathematics developmental education sequence. Moreover, this dissertation focuses on Latinx

students because studies show that they are least likely to complete the required sequence of classes. As Kurlaender and Larsen (2013) argue, “Disparities [in basic skills course-taking], even controlling for high school test scores, suggest that there are clearly other factors (observed or unobserved) that lead to systematic differences in outcomes between students from different racial/ethnic groups” (p. 16).

Assessment and Placement Overview

At the start of this dissertation placement testing was the primary method of sorting students into English and mathematics coursework in California. However, by the end of this dissertation study CCCs no longer administered standardized placement testing as the main A & P method because they had shifted to AB 705’s MM. Though students were not subject to a college entrance exam and could not be denied admission to a community college the A & P process was a portal that determined whether entering students were ready for college-level or developmental education courses (Scott-Clayton, 2011). As mentioned earlier, A & P was a policy mandating that student’s skills in mathematics and English be assessed. The primary way of A & P was a two-step process, a standardized examination of entering student’s skills and subsequent placement into coursework (California Legislature, 2011; Rodriguez et al., 2016; Scott-Clayton, 2011). Placement testing primarily sorted students in developmental education classes based on scores and a predetermined rubric with corresponding courses (Bailey et al., 2015; Foote, 1995; Melguizo et al., 2013a). Assessment of mathematics skills was typically conducted via a computerized, untimed, and low-cost, standardized exam that is quick and economical, characteristics which community colleges favor (ACT, 2015; Rich, 1993; Safran & Visher, 2010). Since the 1980s about 90% of community colleges nationwide used placement testing as the institutional mechanism to sort most incoming students into developmental

education or other transfer-level mathematics courses (Parsad et al., 2003; Woods, 1985).

However, assessments of students English and mathematics skills could have been made using non-testing methods.

A & P Practices and Policies: Minimum Cut-off Scores

While community colleges had implicitly assumed confidence in A & P as an objective process (Safran & Visser, 2010), many aspects called this into question. Nationally and in California, A & P cut-off scores were linked to a preselected minimum proficiency level for a student to be assigned into college-level or developmental education courses (Acevedo-Gil et al., 2014; Bailey, 2009; Collins, 2008; Gerlaugh et al., 2007; Hodara et al., 2011; Hughes & Scott-Clayton, 2011; Prince, 2005; Safran & Visser, 2010; Solórzano, 2012). A & P cut-off scores often started off as composite scores pre-manufactured by test developers such as The College Board and ACT, the two biggest A & P exam developers (Hughes & Scott-Clayton, 2011). Community colleges, as autonomous institutions, decided whether to raise or lower the manufacturer's suggested cut-score minimums, which meant that the same assessment score could yield dramatically different levels of course placement outcomes for the same student depending on the institution they attend (Rodriguez et al., 2016).

Consequently, A & P policies, whether centralized, determined by a statewide governing body, or decentralized, established by campus or districts, were inconsistent across the nation (Bailey et al., 2010; Hodara et al., 2011; Melguizo et al., 2013a; Safran & Visser, 2010). Yet, a common practice of adjusting placement test scores which could skew the objectivity test developers originally intended community colleges continued to take A & P results at face value despite potential impact on student course placement outcomes.

A & P minimum cut-off score practices were based on less than sound assessment practices. Research showed that key stakeholders' decisions about establishing cut-score minimums were based on a combination of existing institutional norms, political pressure, funding, and staffing, not just data (Melguizo et al., 2013a; Safran & Visher, 2010). Variability in A & P practices could also be seen in community college's retesting policies. Even while administering the same standardized examination community colleges had their own retesting policies. Students who placed into developmental education may have been allowed to retest on the same day in some colleges or after three years had passed in others (Hughes & Scott-Clayton, 2011; Rodriguez et al., 2016; Safran & Visher, 2010). Community college key stakeholders were often unclear about, or completely missing, ruling A & P policies (Collins, 2008).

Stakeholders also "lack[ed] technical expertise and resources" (Melguizo et al., 2013b, p. 692) necessary to critique the standardized assessments they administered to and required from entering students who were even less likely to have the tools to critically question the A & P process. In turn, community college stakeholders used subjective practices and could not appropriately adjust flawed A & P policies and practices that were detrimentally impacting students (Popham, 2009; Safran & Visher, 2010).

A & P Standardized Assessments

Few studies examined the validity of A & P standardized test instruments. Those that existed were primarily produced by test developers (Belfield & Crosta, 2012). The two most common A & P instruments, ACCUPLACER and Compass, were produced by college admissions testing companies The College Board and ACT, respectively (ACT, 2015; Hughes & Scott-Clayton, 2011). One study of a statewide community college system found that the Compass under-placed students and sorted them into unnecessary courses, increased the number

of semesters to transfer, and/or reduced the likelihood of transfer (Belfield & Crosta, 2012). Compass wrongly assigned 3 out of 10 students into developmental education courses, where their motivation and engagement with the material may have been decreased (Belfield & Crosta, 2012).

Despite Compass' long history of placing students into developmental education courses at high rates without clear evidence that placement test scores resulted in the appropriate placement, community colleges trusted this assessment method and used it as their sole method for determining course placement (Belfield & Crosta, 2012; Hughes & Scott-Clayton, 2011; Scott-Clayton, 2012). In California about than thirty community colleges administered the Compass for the A & P of entering students (CCCCO, 2016). That usage continued until 2016 when ACT chose to eliminate its Compass test to prevent further detriment to students (ACT, 2015; Fain, 2015). Without that elimination, community colleges, including the community college in California, might have continued to administer a faulty standardized test with erroneous results that were detrimental to student outcomes.

ACCUPLACER was the dominant community college standardized placement test on the market but was no less problematic. The ACCUPLACER was deemed to have content validity (the extent a construct is being measured) but not predictive validity (projecting the future performance of students) (Belfield & Crosta, 2012; Hughes & Scott-Clayton, 2011). A lack of predictive validity meant that the standardized exam could not accurately determine whether students would be successful in college-level courses and sentenced them to developmental education. Still, that same year community colleges continued to measure student's college-ready skills using the ACCUPLACER. Meanwhile, the College Board pivoted by rebranding the

exam to the *Next-Generation ACCUPLACER* which was launched in 2019 (The College Board, 2016).

The literature noted the need for consensus, not only on cut-off scores but on A & P policies overall. Especially the standards for defining a student's readiness for college-level courses, including alignment between K-14 curricula (Hughes & Scott-Clayton, 2011; Safran & Visher, 2010; Weissman et al., 1997). There was a need for key stakeholders and policymakers to build common ground and sound policies by asking critical questions like, "is there a common assessment and placement process?" (Melguizo et al., 2013a, p. 696). Until clear and consistent A & P policies and practices were established, community colleges would continue to perpetuate inaccurate A & P measures at the peril of student's academic future (Collins, 2008; Prince, 2005).

Student Experience with A & P

A & P was typically embedded within same-day matriculation. Matriculation was comprised of multiple steps that included a slew of information which made A & P, specifically placement testing, seem innocuous to incoming students responsible for undergoing the process independently (Safran & Visher, 2010; Venezia et al., 2010). Few studies directly addressed community college student's experiences with A & P. Using community college student focus groups as well as interviews with administrators and counselors across California, research found that entering students were unaware about the purpose of A & P and confused by its varying policies and practices (Safran & Visher, 2010; Venezia et al., 2010). After receiving A & P scores, CCC students were stunned to find out that they could not enroll directly into college-level courses (Scott-Clayton, 2011). A feeling of confusion on the students part could have been

connected to little A & P standardization within campuses, districts, and states, where administrators urged them to take A & P right away (Venezia et al., 2010).

Community colleges' organizational structure and culture institutionalized and condoned a consistent pattern where administrators, counselors, and staff were required to, but typically provided little information to students about A & P before assessing their skills and subsequently placing them into developmental education courses (Bailey et al., 2015; Karp, 2013; Safran & Visher, 2010; Venezia et al., 2010). Community colleges were (and are still) organized on a standard model that is incongruous with the needs and experiences of incoming students (Dougherty et al., 2017; Lahr & Jenkins, 2021; Karp, 2013). Within the self-service or cafeteria-style community college model, the school culture rested on the expectation that students will know how to navigate the community college system and transfer in two years with little or no support from administrators, counselors, and other stakeholders (Bailey et al., 2015; Center for Community College Student Engagement, 2012; Karp, 2013). Community colleges ran (and still run) on the assumption that all incoming students have reviewed matriculation policies, including A & P. Expecting students to question the A & P process and developmental education course placement was unfair when the practice at most CCCs was to deflect students' attention away from the high-stakes consequences of A & P and deter them from leaving to prepare for A & P because of a fear that students would not return to enroll in coursework (Safran & Visher, 2010; Venezia et al., 2010). After undergoing A & P, students asserted that they would have taken A & P more seriously if notified early on about developmental education course placement and its impact on transfer (Venezia et al., 2010). Students went as far as to blame themselves for poor A & P preparation and performance (Venezia et al., 2010). Moreover, once enrolled in

classes, community colleges expect students to know when they are near failing, pinpoint issues, and access the right supports for their needs (Bailey et al., 2015; Karp, 2013).

Racialized A & P

A & P, like developmental education, was commonly accepted as a race-neutral process despite disparate impact by race and ethnicity, as documented above. Research showed that developmental education “students with greater need were more likely to enroll in colleges that were urban, large, certificate-oriented, and serving high proportions of minority students, particularly Hispanic and economically disadvantaged populations” (Bailey et al., 2010, p. 264). Moreover, women, African American, and Latinx students were more likely to require greater levels of remediation (Bailey et al., 2010). The cafeteria-style model described earlier was (and still is) an unstructured pathway with the potential to benefit White middle-class students who had positive experiences dealing with educational authorities due to the extensive coaching received from their parents over the years. Research regarding contextualized language acknowledges that students have varying degrees of opportunities to learn from experiences at home (i.e., bedtime reading) and in school (i.e., access to a science lab or field trips) that ultimately inform their social practices when approaching learning and even, testing situations (Gee, 2003). However, under this community college model, Latinx students may have been significantly disadvantaged (Scott-Clayton, 2011) since they had fewer experiences with enacting White middle-class norms at home and school to assist them in navigating the A & P process. Overall, as was evident in the literature, A & P was a highly inequitable process, especially for Latinx students.

Latinx Demographic Context

Latinx students, as a group, are projected to become the next majority-minority in the U.S. by 2044 (U.S. Census Bureau, 2015a). This population forecast became a reality for California in 2014 when Latinx individuals reached the majority (38.8%) and are still increasing in numbers (Panzar, 2015; Resse & Magagnini, 2015; U.S. Census, 2015b). The Latinx population varies from monolingual-Spanish speakers, bilinguals to proficient in English (Pérez Huber, 2010; Stepler & Brown, 2016). The U.S. is the second-largest Spanish-speaking country globally, after México (Carroll, 2015; Lopez & Gonzalez-Barrera, 2013). Almost a third of the U.S. population speaks Spanish, about 40 million are native Spanish speakers, and 11.6 million are bilinguals (Carroll, 2015). Latinx individuals may have recently immigrated to the U.S., have resided in the U.S. for multiple generations, and anywhere along that spectrum (Fry & Passel, 2009).

A broadly accepted notion of English as a prerequisite for success in the U.S. starts very early and carries into postsecondary education. Despite having many Spanish speakers, the American educational system touts itself as using only decontextualized academic language void of cultural norms and values accessible to students of all backgrounds (Gee, 2003). Yet, in school settings, contextualized language favors White middle-class students' experiences by requiring that historically marginalized students, particularly Students of Color, surrender their vernacular or home language practices and exclusively adopt academic discourse (Gee, 2014). Continuing to strip students' language demonstrates that the legacy of colonialism remains present in this schooling paradigm and sets them at a disadvantage when it comes to standardized testing. Moreover, the community college system is not immune from privileging White-middle

class English since standardized exams like the placement test continue these inequitable language practices which impact Latinx students.

The demographic shift is also evident in the K-12 education sector, where Latinx students are the largest and fastest-growing racial/ethnic group (Lee et al., 2011; Santiago et al., 2015). In 2011-2012, Latinx students made up 24% of the nation's overall K-12 population, while in California, they represented the majority (52%) (Santiago et al., 2015). Yet, despite high enrollment rates in K-12 schools, Latinx students have the lowest levels of bachelor's degree attainment (Acevedo-Gil et al., 2014). Across the U.S., community colleges enroll 45% of all undergraduates and the majority (57%) of all Latinx undergrads (AACC, 2016).

Research suggests that nearly 75% of all Latinx undergraduates in the U.S. start post-secondary education by enrolling in a community college (Rhoades, 2012). States, like California, where a large number of Latinx individuals reside tend to skew postsecondary enrollment trends since their residents primarily attend community college (Zerquera et al., 2018). For instance, three-fourths of California's Latinx students enroll at community college, while these figures are consistently lower nationwide. In 2017-2018, the CCC system enrolled a plurality of Latinx (44.54%), followed by White (25.88%), Asian (11.56%), and African American (5.9%) students (CCCCO, 2020). This study was well-positioned to examine Latinx student experiences with A & P since California enrolled a plurality.

A & P Experience for Latinx Students

The previously outlined A & P policies and practices impacted all students. However, Latinx students encountered additional challenges. Latinx students were the most likely to be sorted into developmental education after undergoing A & P and, simultaneously, the least likely to transfer (Solórzano, 2012). Latinx students' educational and testing experiences were shaped

by additional characteristic factors: language, culture, and in particular, race (Pérez Huber, 2010; Solórzano & Delgado Bernal, 2001). Standardized assessments were commonly accepted as objective and race-neutral evaluations of student academic performance. However, Steele and Aronson's (1995) groundbreaking research demonstrated that stereotype threat lowered test performance for Students of Color, including Latinx students. Despite having similar past academic performance, when informed that a test evaluated their intellectual abilities, African American college student's scores on the GRE English Literature exam were lower than European American's because they recalled prevailing negative stereotypes about their racial/ethnic groups' academic performance, which triggered a fear of fulfilling a negative image (Steele & Aronson, 1995). Latinx, as Students of Color, that underwent high-stakes standardized placement testing may not have been immune to stereotype threat (Steele & Aronson, 1995).

Latinx students have experienced challenges with advising, in particular regarding A & P. A study of five CCCs found that one out of eight Latinx students did not have a transfer strategy to a four-year institution (Gándara et al., 2012). Only 7% of Latinx students surveyed mentioned counseling services as part of their strategy for transfer (Gándara et al., 2012). Despite Latinx students having aspirations to transfer they are unlikely to connect with counselors. Yet, counselors who serve students after taking A & P and address developmental education course placement have a prominent role in their decision to enroll in developmental education, re-test, or contest the outcomes altogether (Maldonado, 2019).

Community college counselors legitimize A & P outcomes and developmental education course placements along with racial and ethnic disparities for Latinx students (Maldonado, 2019). Maldonado (2019) found that a group of CCC counselors, though well-intentioned, were biased when reviewing transcripts from affluent and modest high schools. Counselors assessed

students who attended an affluent high school with greater academic rigor and awarded higher course placements than pupils from a modest high school. Thus, Maldonado (2019) argued that through A & P, SCC counselors “recreat[ed] race categories and racial hierarchy [...] by reinforcing beliefs about White students as intelligent and deserving higher placements and Latin[x] students as comparatively lower in ability and deserving remediation” (p. 280). Counselors’ advising showed how internalized beliefs about race and ethnicity tacitly eclipsed their ability to make course placement decisions based on students’ level of academic preparation for coursework.

Multiple Measures

As previously mentioned in chapter one, MM was implemented at the CCCs at the end of this dissertation study. MM refers to using two or more means of assessing students’ proficiency in mathematics, English, and English as a Second Language. MM may include cognitive and affective student characteristics, including standardized placement tests, past educational experiences, and educational aspirations (Melguizo et al., 2013a). The district decides which factors are deemed acceptable and which mathematics and English classes students will be sorted into (CCCCO, 2015). Nationally, there is little consensus about which MM strategies should be incorporated into A & P policies and practices. In some cases, community college faculty perceive MM as subjective considerations that undermine A & P outcomes and, consequently, academic rigor (Safran & Visher, 2010).

Since the full implementation of MM by California community colleges starting in fall 2019, access to transfer-level mathematics coursework has increased in California overall. A study showed that in fall 2015, of first-time CCC students, a mere 21% were given access to transfer-level mathematics. By the fall of 2019 that rate skyrocketed to 78% (Cuellar Mejia et al.,

2020). In terms of completion, in the fall of 2019, about 31,000 more students passed a transfer-level mathematics course than in the fall of 2015 (Cuellar Mejia et al., 2020). However, Latinx and African American students still showed depressed rates of course completion. Despite increases in access and completion rates in transfer-level mathematics courses overall, disparities persist. These findings show the preliminary positive impact of MM policies; however, they also suggest that Latinx students continue to be disenfranchised.

This dissertation study examines Latinx student experiences with two types of A & P mechanisms, standardized placement testing as well as MM. Examining A & P and MM from a student perspective meant new narratives would provide a picture of the demise of A & P and the emergence of MM community college policies and practices on the ground. Moreover, while traditional one-time high stakes testing for A & P became obsolete in California, other states (e.g., Arkansas and Nevada) continue to use this method to assess the skills of incoming students (Barnett & Reddy, 2017; Rutschow et al., 2019; Whinnery & Pompelia, 2018), which means this study can be used by community college systems across the U.S. to guide their current A & P practice, future directions, and policy changes for student success.

Theoretical Framework

Critical Race Theory (CRT) and Latinx Critical Race Theory (LatCrit) are introduced in the next section. These theoretical frameworks guide this study.

Critical Race Theory

“As theoretical frameworks, CRT and LatCrit explore the ways that so-called race-neutral laws and policies perpetuate racial and/or ethnic and gender subordination” (Delgado Bernal, 2002, p. 108). CRT and LatCrit were the theoretical frameworks by which I critically analyzed how Latinx students’ experienced A & P policies and practices at community college under the

Student Success Act of 2012. Since LatCrit emerged from Critical Race Theory (CRT), the latter will be introduced first. CRT originated in legal studies after the civil rights movement and has since been applied to the field of education (Delgado & Stefancic, 2012; Ladson-Billings & Tate, 1995).

CRT in education aims to examine how racism, classism, sexism, and forms of oppression impact educational structures, practices, and discourses of Students of Color (Ladson-Billings & Tate, 1995). CRT affirms that race and racism are central to and embedded within the U.S. educational system, K-12, and throughout postsecondary education. Moreover, CRT holds the premise that race is a social construct centered on institutional power and that racism serves to systematically allow and disallow access to educational resources for specific groups (Solórzano & Yosso, 2001). CRT simultaneously interrogates and counters the narratives that perpetuate the privileging of Whiteness through institutional policies and practices. For instance, CRT challenges ingrained notions of meritocracy and colorblind ideologies, which privilege Whites and disadvantage People of Color by grounding in a historical context (Delgado & Stefancic, 2012). In the process, CRT offers an opportunity to critique the status quo and reveal the characteristics of race and racism embedded within the educational structure (Ladson-billings & Tate, 1995).

Latinx Critical Race Theory

LatCrit's five tenets are aligned with those of CRT. LatCrit highlights the multi-layered identities of Latinx people and the distinct ways in which race and racism impact their experiences within education. Also, LatCrit examines how racism and other forms of oppression impact educational structures, practices, and discourses of Latinx students. The five tenets of LatCrit are the centrality of race and racism, challenging dominant ideology, foregrounding

experiential knowledge, dedication to social justice, and an interdisciplinary approach (Solórzano, 1997).

The first tenet is the centrality of race and racism, which accounts for race and racism as part of the fabric of U.S. society, as a social construct, and as a mechanism of oppression for People of Color that simultaneously benefits Whites, by examining the intersection between race, racism, gender, class, and sexuality, among other forms of oppression. Additionally, LatCrit accounts for the intersection of race, racism, phenotype, culture, surname, immigration status, accent, and language (Delgado Bernal, 2002).

The second tenet challenges dominant ideology by questioning the notion that the educational system affords meritocracy, objectivity, colorblindness, equality of opportunity, and race neutrality (Yosso, 2006). This includes examining educational approaches that “pretend to be neutral or standardized while implicitly privileging White, U.S.-born, monolingual, English-speaking students” (Yosso, 2006, p. 7). The third tenet foregrounds the experiential knowledge of Latinx students by highlighting their everyday lived experiences as a legitimate part of knowledge production. LatCrit is guided by the belief that Latinx students are “holders and creators of knowledge” and not passive study participants (Delgado Bernal, 2002, p. 110). The fourth tenet cements a commitment to social justice in education and transforming society by eradicating oppression and uplifting marginalized groups. A fifth tenet is an interdisciplinary approach to analyzing forms of oppression like racism, sexism, homophobia, and classism from a historical context and across disciplines (Solórzano, 1997).

The two LatCrit tenets that were key to this dissertation were challenging dominant ideology and foregrounding the experiential knowledge of Latinx students. The tenet, challenging dominant ideology, was relevant to this study because it allowed for examining A &

P as an educational approach steeped in objectivity but consistently had a disproportionate impact on Latinx students (Acevedo-Gil et al., 2014). Additionally, this study examined the tenet, foregrounding the experiential knowledge of Latinx students to learn from their lived experiences and center them as knowledge creators.

Chapter 3: Methodology

This study seeks to understand how assessment and placement (A & P) policies and practices influenced Latinx California community college (CCC) students. Specifically, I focus on first-time, first-generation college Latinx students sorted into developmental education mathematics courses due to A & P processes. Qualitative research allowed students to express and interpret their experience with A & P at community college (Merriam, 2009). By conducting individual interviews, I, as the researcher, was able to explore and grasp the multifaceted experiences and understandings of Latinx students A & P. In-depth interviews were guided by the study's research question:

How do Latinx California community college students experience assessment and placement policies and practices?

Positionality Statement

As the primary data collection instrument in qualitative research (Merriam, 2009), the researcher's role, or positionality, must be accounted for at the beginning of the study. Acknowledging my own potential biases and influence in this study is essential, specifically, my insights on higher education, community colleges, and A & P, which are informed by research and by my personal experiences. My values, beliefs, assumptions, and biases can be considered constructive and valuable instead of unfavorable (Locke et al., 1987) and contribute to the research setting (Creswell, 2013).

I am Latinx, a first-generation college student, and formerly undocumented, all of which informed my decision to enroll at a CCC. The English placement test assigned me to a basic skills English class, which I did not know contained non-transferable units, benefiting from additional years of navigating the CCC system and transfer requirements for the mathematics

placement test. I was fixed on being assigned to Trigonometry. I needed to be eligible to apply for transfer by my target date. I ignored the Assessment Center staff's encouragement to select the easy exam, studied with the support of a tutor, and placed at my goal. My distinct experiences inform, in part, my perspective on A & P and this research study.

After graduating from the University of California, Berkeley, I matriculated in a doctoral program at the University of California, Davis. I learned that A & P was a pervasive exit point and a mechanism for sorting students into developmental education courses (Venezia et al., 2010). Exploring A & P as my dissertation topic allowed me to center the voices of current Latinx CCC students and develop narratives that informed research policy and practice. Also, I have co-authored a published research study that quantitatively examined a decade of national matriculation trends for Latinx community college students, which countered a common narrative about where they attended college (Zerquera et al., 2018).

I also conducted independent research, which resulted in paper presentations at premier national conferences in education. For instance, at the Association for the Study of Higher Education, I presented research on how CCC websites communicated information about A & P to students. As a Richard J. Riordan Summer Intern at the Public Policy Institute of California, I examined AB 770, which awarded \$90 million to 64 CCCs as part of the Basic Skills Student Outcomes Transformation initiative. Also, I hosted The Community College Lady podcast, which covered topics such as successful transfer strategies, education policy updates, and student wellness. Most recently, I was a Research and Policy Fellow at UC Berkeley's Chicana Latinx Student Development Office and supported the Office of Equity and Inclusion's Hispanic-serving Institutions (HSI) Initiative by researching and synthesizing best practices and policies

instituted by Chicana/Latina resource centers across the University of California system. These experiences informed my positionality as a researcher and this study.

Setting and Context

The research was conducted at one community college campus in Northern California: Sunshine Community College¹ (SCC) (pseudonym). As community colleges across the state, SCC served students with multiple purposes, such as enrolling in general education courses, preparing for a career, attaining degrees in occupational areas, and transferring to a four-year college. SCC also granted associate degrees and certificates of achievement in the arts and sciences. To maintain confidentiality, given that there are a limited number of campuses in Northern California, only a few general demographics about the community college in this study were disclosed.

In 2017-2018, annual enrollment for SCC was less than 15,000 students (headcount), making it a smaller community college than the state average, which matriculates about 20,000 pupils per campus (CCCCO, 2019). While the percentage of first-generation college student enrollment hovered at about 40% at the state level. In comparison, rates were about ten percentage points lower for SCC (CCCCO, 2019).

As seen in Table 1, in race and ethnicity, an estimated one-third and half of SCC's student enrollments were Latina and White during the same academic year, respectively (CCCCO, 2019). In comparison, the state averages showed race and ethnicity figures were nearly inverted during the same time, with White students topping out at about 25% and Latina at an estimated 45% (CCCCO, 2019). Additionally, Asian student enrollment at SCC and the State

1 The name of the community college, as well as that of participants and other potentially identifiable information, have been changed to a pseudonym in order to protect the identity of participants and the institution in this study.

level represented about 5% and 10%, respectively. Latinx students comprised the largest ethnic group enrolled at the state level and the second largest at SCC.

Table 1

Percent of Student Enrollment and Completion by Academic Preparation

Variable	Race/Ethnicity		
	Latinx	White	Asian
Overall Student Enrollment			
State	45	25	10
SCC	35	50	5
Underprepared Students in Mathematics			
State	40	40	50
SCC	40	40	60
Overall Completion for Underprepared Students			
State	40	45	60
SCC	35	30	65
Overall Completion for Academically Prepared Students			
State	65	70	80
SCC	65	55	100

Note. Overall Completion for Underprepared Students refers to the percent of students who took at least one developmental education English or mathematics class and earned a degree, certificate, or transfer to a four-year college. Percentages rounded to multiples of five for the institution's confidentiality. Also, data were obtained from the 2019 Student Success Scorecard.

After student's English and mathematics skills were assessed at SCC they were either deemed academically prepared or underprepared for college-level coursework. Students who

were considered academically prepared in mathematics were allowed to enroll in a course with college-level credit. Conversely, students identified as academically underprepared enrolled in at least one developmental education mathematics course. Rates of academic preparation were identified through the Student Success Scorecard developed by the California Community College Chancellor's Office (CCCCO, 2019). At SCC, Latinx and White students were deemed academically underprepared for mathematics at rates of about 40%, which meant they were required to enroll in at least one basic skills class (See Table 1) (CCCCO, 2019). In comparison, approximately 60% of Asian pupils were found academically underprepared for mathematics at SCC. As Table 1 shows, at the state level, the rates of students considered academically underprepared for mathematics were identical for Latinx and White, at an estimated 40%, but were higher, about 50%, for Asian students.

The 2019 Student Success Scorecard offers a summary of the success of students deemed academically prepared and underprepared. However, the Student Success Scorecard does not disaggregate completion rates by subject, English or mathematics, but allows a comparison among peers. Table 1 shows that the rates of SCC Latinx, White, and Asian students considered academically underprepared who completed a degree, certificate, or transferred were about 35%, 30%, and 65%, respectively. Statewide the percentage of academically underprepared students who completed a degree or certificate was 40%, 45%, and 60% for Latinx, White, and Asian students, respectively (Table 1). Latinx and White student academic underpreparation and completion rates were similar at SCC. Asian students considered academically underprepared had the highest completion rates among these racial/ethnic groups at SCC and statewide. On average, Latinx students deemed academically underprepared had slightly higher completion rates at the state-level than at SCC. Lastly, Table 1 shows that academically prepared students fare

better when it comes to completion rates regardless of their race/ethnicity. At the state-level Latinx students who were academically underprepared completed a certificate, degree, or transferred at a rate of 40% in comparison to 65% of academically prepared peers.

Overview of SCC Advising Structures and Procedures

This section provides an overview of SCC advising structure and procedures, including mathematics course sequence, placement testing, multiple measures, support services, and enrichment programs. As mentioned earlier, this study took place during a particular snapshot in time, prior to the statewide implementation of AB 705 from the summer of 2018 through the fall of 2019. This study collected data regarding the experiences of SCC students with A & P. SCC primarily used standardized placement testing, but also applied campus-developed MM. SCC's A & P procedures have changed since the implementation of AB 705.

SCC's Mathematics Course Sequence

A mathematics course sequence refers to the mathematics classes offered at SCC, and the linear order students must complete them. Delineating SCC's sequence of mathematics courses is essential because it allows for an understanding of student experiences with A & P, educational planning, and how they navigate selecting and enrolling in mathematics courses. The mathematics coursework student participants were placed into because of A & P is described next and visually represented in Table 2. The course's content, structure, and how many fundamental skills courses they needed to take before reaching a transferable class. The mathematics course sequence is divided into STEM and Non-STEM majors (See Table 2). At SCC, STEM majors focus on science, technology, engineering, mathematics, and business. To be eligible to transfer to a four-year college, students must complete at least one transfer-level mathematics course, as appropriate for their major. As part of the criteria to participate in this

study, all student participants took the placement test, received an outcome corresponding to a mathematics developmental education class, and enrolled in an introductory skills course. Both developmental and transfer-level classes are part of SCC’s sequence of mathematics courses. Any mathematics course required before enrolling in the next course in the sequence is considered a pre-requisite. Each mathematics class represents one semester of coursework for student participants.

Table 2
SCC’s Sequence of Mathematics Courses by Major

Mathematics Course Sequences	
STEM & Business Majors	Non-STEM Majors
<i>Developmental Education Level</i>	
Pre-Algebra ^a	Pre-Algebra ^a
Elementary Algebra	Algebra & Pre-Statistics ^a
Intermediate Algebra	NA
<i>Transfer Level</i>	
Trigonometry or Statistics or Business Calculus	Statistics
Pre-Calculus	NA
Calculus 1	NA

Note. The table shows mathematics courses offered at SCC and their prerequisites in sequence or hierarchical order. To maintain confidentiality, a partial list of mathematics courses offered at SCC is displayed. Additionally, “NA” is listed when a variable is not applicable. The title of mathematics courses that were identifiable as specific to SCC was changed to a pseudonym to maintain confidentiality.

The following provides a description of SCC’s mathematics course sequence by major, STEM, and non-STEM. The non-STEM mathematics course sequence consisted of three courses entitled, Pre-Algebra, Algebra & Pre-Statistics, as well as Statistics (See Table 2). The course sequence needed to be completed in this order. The first course for non-STEM majors needed to

take depended on their course placement. The mathematics course sequence began with Pre-Algebra, and all classes stemmed from this starting point. Pre-Algebra was the first basic skills course in the non-STEM sequence of courses. Pre-Algebra was non-transferable and a pre-requisite to Algebra & Pre-Statistics. Pre-Algebra was designed to review mathematics concepts in arithmetic, basic algebra content (e.g., linear equations, the rectangular coordinate system), and implementation of proportions. The next mathematics course in the non-STEM sequence was Algebra & Pre-Statistics. The Algebra & Pre-Statistics course was a developmental education class and a pre-requisite to Statistics. Algebra & Pre-Statistics covered quantitative terminology, critical thinking, and preparation for Statistics. Statistics was the only transfer-level course required on the non-STEM transfer sequence. The final course in the non-STEM sequence of courses was Statistics. Statistics covered, for example, hypothesis testing and probability as well as predictive techniques. When non-STEM majors were placed in Pre-Algebra, the lowest course in the sequence, it took a minimum of three semesters or one and a half years to complete mathematics transfer requirements.

The mathematics course sequence for transfer was longer than for STEM majors non-STEM majors. It covered course content like integer exponents, rational expressions, and parabolas. Of note, the STEM transfer track included business majors. The STEM mathematics course sequence comprised Pre-Algebra, Elementary Algebra, Intermediate Algebra, Trigonometry (the first transfer-level class), and any additional mathematics courses required for transfer. Elementary Algebra was a basic skills course, a pre-requisite class for Intermediate Algebra. Intermediate Algebra was a basic skills course, a pre-requisite for Trigonometry, and course content included equations in single variable and logarithmic functions.

Trigonometry was the first transfer-level course on the STEM transfer sequence and a pre-requisite for Pre-Calculus and more advanced courses in the sequence. Trigonometry course content included trigonometric proofs, equations, and vectors. STEM students placed in Pre-Algebra, the lowest course in the mathematics sequence, took four semesters or two years to complete the first transfer-level class. STEM majors may take longer to meet all mathematics transfer requirements based on the number of additional transferable mathematics courses required for transfer.

SCC Placement Testing

A & P was the mechanism SCC used to determine students' mathematics skill set and subsequent course placement either at the basic skills or transfer level. At SCC, the standardized placement test administered was the ACCUPLACER developed by The College Board. The ACCUPLACER is an adaptive examination. The ACCUPLACER adjusts the difficulty level of mathematics problems according to students' responses. As students answer mathematics problems correctly or incorrectly, they are presented with more and less challenging questions, respectively. Once the ACCUPLACER locks in on a student's mathematics proficiency, the examination ends. The student is assigned a score, which corresponds to a mathematics course. SCC staff grants students access to their first mathematics class using the resulting course placement.

There were three ACCUPLACER placement tests for mathematics administered at SCC. Placement tests covered different content corresponding to SCC's mathematics course sequence. The first placement test was designed to assess students' knowledge of Arithmetic. Students could place into Pre-Algebra, Elementary Algebra, as well as Algebra & Pre-Statistics. The second standardized examination was designed to assess students' knowledge of Elementary

Algebra. The second placement test could result in course placement into various classes such as, Algebra & Pre-Statistics, Elementary Algebra, Intermediate Algebra, and Statistics. The third placement examination was geared toward assessing students' college-level mathematics skills and could result in a course placement beginning with Algebra & Pre-Statistics up to Calculus 1. Students who took the first or second placements tests and earned a high enough score could be administered an additional examination which gave them the opportunity to place into a more advanced mathematics level. Students who took the second or third mathematics placement test could be placed into any basic skills course except Pre-Algebra.

SCC Alternative Assessments

The Student Success Act of 2012 called for assessing students' mathematics skills set and offered several methods for achieving this goal. The alternative assessment referred to measures other than placement testing for course placement. The Student Success Act of 2012 listed the following as forms of measuring student's mathematics skills, "interviews, standardized tests, attitude surveys, vocational or career aptitude and interest inventories, high school or post-secondary transcripts, specialized certificates or licenses, educational histories, and other measures of performance" (California Legislature, 2012). Methods used to assess students' mathematics skills beyond placement testing were considered alternative assessments. However, like many community colleges in California, SCC, like many community colleges in California, SCC primarily used a standardized placement test to evaluate students' readiness for transfer-level courses.

SCC Multiple Measures

Before the required implementation of MM under AB 705 in the fall of 2019, the mathematics department changed A & P policies to introduce campus-specific MM at SCC. The

MM standards were developed by SCC's mathematics department and were used specifically for their student population. Applying MM policies meant that students did not have to be administered a placement test. SCC's early introduction of MM applied to new students who submitted their high school transcripts. SCC counselors used students' high school transcript data, specifically the grade in their last mathematics class, to apply the MM policies. Counselors assessed students' mathematics skills with MM by using a predetermined mathematics course equivalent rubric. Notably, SCC counselors possessed discretion over A & P practices. They had the authority on whether to apply the MM standards instead of placement testing. The MM standards matched high school mathematics coursework to SCC's equivalent classes. Students who passed Algebra 1 and Algebra 2 with a letter grade of *C* or better were eligible for automatic course placement in Elementary and Intermediate Algebra, respectively.

California High School Graduation Requirements

The State of California required students to complete two years of mathematics courses to graduate from high school. Also, California high school graduates were expected to complete a minimum of Algebra 1 (California Department of Education, 2020), the equivalent of Elementary Algebra, a course without transfer credit, and the second-lowest level in the mathematics course sequence. The background information presented above will be referenced later in the findings chapter.

Gaining Access to Sunshine Community College

The study spanned from summer 2018 to fall 2019. I gained access to the campus by establishing an informal connection with a campus administrator. After I expressed interest in working with the community college, the campus administrator referred me to SCC's Data Administration Office via email. Data Administration Office personnel requested further details

about the dissertation study via email and scheduled an in-person meeting with me. During the in-person meeting, I discussed the dissertation study. I presented proof of approval from the Institutional Review Board at the University of California, Davis. Approval from the Institutional Review Board was received before beginning this research study. To minimize risk to participants and uphold anonymity, the identity of participants and the community college in this study were kept confidential and anonymous by changing the names of participants in all documents and reports.

After gaining entry I visited the research site, SCC, on a bi-weekly basis, on average. Visits to SCC occurred with three general purposes: 1) to promote this research study to recruit potential participants, 2) to conduct interviews with recruited and screened participants, and 3) to spend time at SCC to establish rapport with campus stakeholders, such as faculty, counselors, administrators, and staff. Before and during site visits, I procured meetings, formal and impromptu, with multiple SCC campus stakeholders to introduce this dissertation study and gain support with participant recruitment efforts. Campus stakeholders were employees of SCC who held a position on campus, for example, faculty, staff, counselor, and/or administrator. Campus stakeholders provided access to potentially eligible participants. In-person or via email, campus stakeholders were asked to share information about this research study with their networks, leading to classroom recruitment opportunities.

The Seed Program was an important point of contact because the students being served aligned with the criteria of this dissertation study. The Seed Program provided support services for students from agricultural backgrounds who enrolled at SCC to further their education. Seed Program services included but were not limited to academic counseling, tutoring, and educational funding, which assisted students in successfully transitioning into higher education.

In order to qualify for the Seed Program the student and/or their parent(s) must have been an agricultural worker. Seed Program participants were primarily from Latinx backgrounds. During every site visit, I spent time at the Seed Program office to build rapport with the program administrator and to identify potential Latinx student participants.

Uma (pseudonym), a campus stakeholder and administrator for the Seed Program, was an important and consistent point of contact on campus and a referral broker. Uma provided students with academic advising prior to and/or after having undergone A & P. I provided Uma research study updates, in person and via email, such as progress on recruitment and the number of interviews completed. When at SCC, I typically met informally with Uma for a brief amount of time (e.g., 5 to 15 minutes), at which point she made referrals and suggestions about additional ways to identify and recruit study participants.

There were three additional points of contact at SCC that I communicated extensively with in order to better understand SCC and to gain access to students. Amy was the SCC personnel in charge of overseeing the Education Support Office which administered the mathematics placement test to students. She was employed at SCC for about a decade and possessed a graduate degree. The Education Support Office provided learning resources for all SCC students including tutoring, placement test preparation software, and placement testing. Education Support Office staff shared information about the placement test with students and scheduled their examination appointments. Though not an academic counselor, Amy did not limit her interactions with students to answering queries and presenting them with examination results. Amy provided students with guidance after completing the placement test. Amy indicated that after students took the placement test she would often take the time to explain what the outcomes meant and pointed out what mathematics class the outcomes corresponded with.

Clara was the SCC personnel that administered the STEM Success Program. Clara held a graduate degree in the field of STEM. The STEM Success Program was an academic support program and the main source of institutional support for students who aspired to transfer to a four-year college in a Science, Technology, Engineering, or Mathematics (STEM) major. Funding for the STEM Success Program was provided through a grant from the State of California, which was matched by the local district. Clara was a program administrator but also acted as an academic advisor since she reviewed and guided students academic plans for transfer. She connected with STEM majors before and/or after placement testing. Also, Clara used the placement test outcomes to advise students on which STEM courses to include in their educational plan.

Fatima was a tenure-track mathematics faculty member at SCC. She possessed a graduate degree and was a former high school mathematics teacher. Fatima was often reunited with former students who sought her advice regarding mathematics A & P. Additionally, Fatima was heavily involved in shaping A & P policies and practices at SCC. She lead efforts to develop campus-wide MM policies before California's implementation of AB 705. The context these three personnel provided regarding SCC and student experiences is presented later within the SCC personnel perspective on student experiences with A & P section at the end of the findings chapter.

Research Participants

Multiple forms of data collection were conducted in this dissertation study and were delineated below.

Participants

The primary source of data for this study was interviews with SCC students. In June 2018, potentially eligible students were recruited via purposeful sampling (Creswell, 2013; Merriam, 2009). According to Merriam (2009), “purposeful sampling is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned” (p. 77). Recruitment was the first step in garnering a purposeful sample of participants to learn from the experience of SCC students.

I conducted extensive outreach to recruit student participants. Three of the six recruitment strategies applied yielded student participants. I recruited student participants via institutional data (9), classroom visits (5), and referrals (1) (each is described in detail in the participant outreach section). However, one student was disqualified from the study after being interviewed because they took the English A & P, but not in mathematics, which was the focus of this research study. Therefore, 14 students remained in this research study and were included in data analysis. Students were compensated for participating in this study. After completing a one-hour interview (approximately), participants received a \$25 Starbucks gift card for their time and efforts.

Participant Criteria

To qualify for this study, all student participants were required to meet the following eight criteria. Student participants had to self-identify as being of Latinx heritage. Also, student participants must have graduated from high school or earned a high school equivalency certificate. Further, student participants were considered first-generation college students, which for purposes of this study was defined as neither parents, nor legal guardians, holding a college degree from the U.S. Additionally, student participants must have had the academic goal of transferring to a four-year college when first matriculating at SCC, be enrolled in their first or

second year, and met age criteria which were to be between the ages of 18-24. Moreover, student participants must have undergone A & P, specifically, the mathematics placement test, within one or two years from the interview date. Finally, student participants must have been assigned to and enrolled in an introductory skills mathematics course based on mathematics placement test outcomes.

Eligibility Screening

Determining whether a student participant met the study criteria required a two-step process, administering a student eligibility survey, and a brief follow-up conversation.

Student eligibility survey. The first phase in determining whether student participants met the dissertation study's criteria consisted of administering a student eligibility screening instrument, also referred to as a student eligibility survey, entitled "Student Contact Information Sheet" (see Appendix A). The student eligibility survey was developed to ensure that students met the first six of eight study criteria. The student eligibility screening instrument preliminarily qualified or disqualified student participants for the dissertation study. The student eligibility screening instrument did not inquire about the A & P experience to introduce this crucial aspect of the study during interviews.

The student eligibility survey was vetted by two former community college students who transferred to a four-year college and were enrolled in the same doctoral program as me. The former community college students reviewed the eligibility survey for context and relevance to the community college population. The student eligibility screening instrument gathered background and educational information about students. Student eligibility survey questions consisted of a contact information section (e.g., phone number), eight dichotomous question

responses (e.g., are you a first-generation college student?), and ten open-ended questions (e.g., when did you first enroll at this community college?) (See Appendix A).

After ensuring that student participants met the first six criteria through the student eligibility survey, I moved forward with the second phase to determine whether they met the last two study criteria. I had a brief in-person or over-the-phone conversation to inquire whether student participants had taken the mathematics placement test within one or two years and been assigned to and enrolled in an introductory skills mathematics course. Student participants that qualified under both phases of eligibility screening were scheduled for an interview.

Participant Outreach

Next is the outreach process to hundreds of students, which identified a small number of participants. To inform SCC students about this study, recruitment was conducted.

Table 3

Number of Students Outreached to and Interviewed Using Six Modes of Recruitment

Mode of Recruitment	Contacted	Screened	Eligible	Interviewed
Institutional data	164	36	15	9 ^a
Classroom visits	180	53	6	5
Referral	4	4	1	1
On-campus events	105	9	0	0
Tabling	30	9	1	0
Advertising	0	0	0	0
Total	483	111	23	15 ^a

^aNumber does not reflect disqualification of one student found ineligible after being interviewed. A total of 111 students were administered a student eligibility survey. Each strategy and the number of students present during outreach efforts, student eligibility surveys administered, and interviews conducted are described next.

Students who opted-in were administered an eligibility survey. All of those screened eligible based on the study's criteria were invited to interview. However, only those who completed an interview were deemed study participants. Outreach efforts yielded a total of 483 potential student participants who were introduced to this dissertation study through one of six modes of recruitment: institutional data, classroom visits, referrals, on-campus events, tabling, and advertising (See Table 3). Of the outreached students, 316 learned about the research study on campus and 167 through off-campus efforts.

First, SCC's Data Administration Office provided an institutional data set that included SCC students who closely matched the study's criteria. In the summer of 2018, SCC's Data Administration Office provided a list of nearly 200 students who partially met study criteria. Student matriculation records were accessed with institutional support. The information provided by SCC Data Administration Office was limited to, for instance, the first-time students enrolled at community college, educational goal, and their first mathematics course. Data regarding whether a student underwent A & P and their subsequent scores were not provided as part of the data set. Each student listed in the institutional data set was contacted with at least two emails and one phone call. The institutional data set yielded 164 potential study participants. Of those, 36 were screened for eligibility, and nine participant interviews were conducted.

Second, brief announcements about this research study were conducted during classroom visits. I emailed instructors for all developmental education mathematics, College Success, and Spanish courses offered. These classes were selected because they enrolled students in developmental education mathematics and/or identified as Latinx. Ultimately, I presented the dissertation study at seven developmental education mathematics and five Success class sessions.

The College Success classes were designed to teach students strategies for academic achievement in college and clarify the connection between majors and future career goals. The College Success course served primarily Latinx students in the Seed Program and the First Program. The First Program is directed at students enrolling at SCC for the first time and of Latinx and historically disadvantaged backgrounds. Classroom visits were the largest source of potential study participants, with 180 students and 53 were screened for eligibility. Five participant interviews were completed.

Third, student participants were sought out by requesting referrals from students who had completed an interview and campus stakeholders because they might have known individuals, potentially matching study criteria, that I would not have access to. See Appendix B for the statement used when requesting referrals to students via email or in person. Four referrals to students were made. All were screened using the student eligibility survey, but only one was found eligible and interviewed.

Fourth, I sought out and was invited to on-campus events to present the aims and objective of this dissertation study to students (see Appendix B for the statement used). Additionally, I spoke about my own journey from community college to graduate school when encouraged to do so. Seventy-five students attended the Ray Program gathering, a summer program designed for high school students to develop credit towards graduation and gain an early college experience. Twenty-five Latinx students attended the Seed Program scholarship workshop. Five students attended the Latinx Student Group meeting, an on-campus organization focused on promoting academic success and community among Latinx SCC students. While campus events yielded 105 students introduced to the study, nine were screened, and none were eligible.

Fifth, I conducted tabling on campus to seek out eligible students from the larger community. I stood next to a table in front of the building that housed the cafeteria, a high student traffic area, on campus for five days. Tabling introduced the study to thirty students (e.g., the importance of the study) using a prewritten recruitment statement (see Appendix B). Nine students were screened for eligibility. One student qualified for the study, but no interview was completed due to multiple cancellations.

Sixth, advertising via flyers with the permission of the SCC administration was carried out. The flyer invited students to participate in the study, presented the first six student eligibility criteria (those related to A & P were excluded), my contact information, and compensation information. The flyer was not included in the appendix to preserve confidentiality since it would disclose the name of the community college. I posted a dozen paper flyers with information about this research study around campus (e.g., in the cafeteria, admissions, and records building) but yielded no interest.

Finally, a student who participated in this study was identified from three outreach sources: institutional data, classroom visits, and referrals. Further, even though 483 students were outreached to and 111 opted to undergo eligibility screening, only 23 students were found eligible for this study. Each of the 23 students who were found eligible for this study was invited to participate. Eight of the eligible students for this study were not interviewed for various reasons, such as repeated appointment cancellations. A total of 14 students who were deemed eligible under the study's criteria completed an interview and were considered participants.

Data Collection: Semi-Structured Interviews

At the time of the interviews, SCC had revised A & P to adopt MM policies developed at the local level and before implementing AB 705 in the fall of 2019. I interviewed all participants

and sometimes referred to myself as “interviewer” in this study. The interviews conducted had three components, a semi-structured interview, presentation of three institutional documents, and concluding questions. Participant interviews ranged between 1 to 2 hours. Three institutional documents were presented to participants during the interview, including a list of enrollment steps, a campus map, and a mathematics course sequence diagram. Each of the handouts contained information tied to specific questions on the interview protocol. The purpose of the institutional documents was to elicit information regarding A & P from participants. More extended interviews had a surge of follow-up questions not included in the protocol that addressed participants’ responses at the moment. The following sections lay out the steps taken immediately before and during the interview.

The first component of the semi-structured interview comprised a list of predetermined open-ended questions for participants to respond to with their own views and opinions (Creswell, 2013). A question on the Student Interview Questionnaire was (see Appendix D) *can you tell me the overall steps you took to go from applying to community college to starting your first math class?*

Interview Protocol

The student interview protocol included an array of interview questions to select from that consisted of 56 questions. To maintain continuity, interview questions were broken up by themes (or sections) (e.g., warm-up, developmental education, and transfer). For instance, the interview questionnaire for participants contained the following sections: *Warm-up*, *Developmental Education & Transfer*, *Multiple Measures*, *Assessment and Placement/Testing*, and *Closing*. Any questions posed in addition to the predetermined interview protocols were in direct response, or a follow-up, to participant statements during the interview.

Before beginning each interview, participants were read the study's participation consent form, and their questions were answered. The consent form included information about the study, the benefits and risks of participating, as well as contact information for the institutional review board and me. See Appendix C to review the study's student consent form. Participants were notified that leaving the interview or the study at any time was their right. Participants were also made aware that data collected would be banked for future use and remain anonymous to protect their identity and privacy. Participants signed the consent form before beginning the interview. A copy was provided.

Before starting the interview, students were asked for permission to be audio recorded. All participants agreed to be audio recorded using two of three forms, an electronic handheld recorder, a cellular device's voice memo application, and a computer using the Word Notebook software's recording feature. Later, two professional transcribers and I transcribed (verbatim) interview audio recordings. Recording allowed me, as the interviewer, to engage in conversation with and get to know participants without focusing on jotting down details of the exchange.

Field Notes and Analytical Memos

Field notes served to provide a synopsis of interviews with participants (Saldaña, 2015). After each interview that I recorded, via audio or in writing, a summary of the interview was prepared. The information captured included, for instance, interview date, time, student comfort level, and observations about the interview. In addition, any outstanding events of the day that may have impacted the interview on the student or my end were included and any occurrences that stood out to me during the particular interview. Examples of outstanding events of the day were participants being behind schedule, stress from examinations, and any questions the participant had before or after the interview.

The field notes allowed me to document interactions that stood out during interviews, such as key details, statements, or expressions by the participant and between the participant and myself, which may otherwise have been lost through the audio recording alone (Saldaña, 2015). In most cases, I audio recorded the field notes immediately after the interview when the interview was most present or fresh in my memory, which reduced the risk of forgetting key details (Saldaña, 2015).

A field diary, or researcher journal, was also used to record my reflections, observations, and perceptions throughout the study, known as reflexivity (Creswell, 2013). My dissertation research journal was applied throughout this dissertation study to ensure reflexivity. By showing reflexivity, “the qualitative researcher systematically reflects on who he or she is in the inquiry and is sensitive to his or her personal biography and how it shapes the study” (Creswell, 2013, p. 182). Reflexivity was a tool to capture who I was as a researcher and how I represented the data. In turn, the field diary supported my development of themes to make meaning of the data by recording and analyzing my own positionality.

I examined my personal thoughts and reactions to student interviews and documents (Creswell, 2013). The field diary was created after the study and was considered a document that can be analyzed using qualitative content analysis (Merriam, 2009). The field diary was audio recorded, provided context, and added a rich narrative description of the findings and trustworthiness. The field diary triangulates the interviews’ data and paints a complete picture of the students and their experiences.

Data Analysis

This study conducted a qualitative analysis of interviews collected. Qualitative data analysis was conducted through a systematic inductive and comparative process to find trends

that characterized the data and addressed the research question (Merriam, 2009). Data analysis involved simultaneously collecting, coding, and analyzing data (Merriam, 2009). Qualitative data analysis followed the constant comparative method proposed initially by Glaser and Strauss (1967). Of note, qualitative data analysis was conducted manually for the first three participants and with the assistance of Computer Assisted Qualitative Data Analysis Software (CAQDAS), namely, NVivo, for the remaining fourteen. More specifically, initial coding was conducted manually and with software assistance. However, axial coding was generated exclusively with the assistance of NVivo software.

I began data analysis by reviewing transcripts for accuracy and to deepen familiarity with the conversations enclosed and data analysis. Then, I moved to coding data inductively (e.g., interview transcripts) through open coding, also referred to as initial coding (Merriam, 2009; Saldaña, 2015). I was open to all possibilities at this point of qualitative data analysis. I made notations, as Merriam (2009) suggested, about “bits of data that strike you as interesting, potentially relevant, or important to your study” (Merriam, 2009, p. 178). While reviewing transcript data, I asked questions like 1) what was surprising? and 2) interesting? (Saldaña, 2015). When a compelling portion of the conversation between the participant and myself was identified, the selection was assigned a representative label, or code name, and defined. When conducting initial coding on paper, I underlined for the first three interviews analyzed, drew a bracket next to the excerpt, then wrote the name and definition of the emerging code on the margin.

After the third manually coded interview, I transitioned to using the NVivo software to analyze data. NVivo was used to assist in data management, storing codes, and data retrieval, for ease of data mining through a large volume of transcript pages (e.g., about 1,400 double-spaced)

(Merriam, 2009; Saldaña, 2015). I uploaded the first three interview transcripts in NVivo and entered the manually created initial codes. Initial codes for the remaining fourteen interviews were entered directly into NVivo. The same initial coding process was carried out within NVivo by digitally highlighting the text of interest then adding a code title and definition in the pop-up box. Initial code names encapsulated the selected transcript's content and importance. A brief definition summarized the code name's meaning.

A record of the names and definitions for each emergent code was recorded in a codebook, also referred to as a code list (Saldaña, 2015). All open codes, including those originally handwritten, were stored within the NVivo software's digital codebook. This sequence of steps was repeated for every participant interview. I conducted line-by-line coding of the entire interview transcript. Throughout the initial coding phase of qualitative data analysis, I was open to all possibilities. I generated over one hundred codes that represented the data.

The next phase of qualitative data analysis was a deductive mode called axial coding and analytical coding. Interview data were transformed from codes to categories/themes (Merriam, 2009; Saldaña, 2015). As Merriam (2009) explained, the terms *code* and *category* are synonymous with "theme," "pattern," "finding," or "an answer to a research question" (p. 178). At this stage of data analysis, I aimed to draw connections and highlight relationships between codes. I reviewed existing initial codes and thought about how they might be grouped into categories that emerged and were grounded in data (Merriam, 2009). I distilled over one hundred initial codes into ten axial codes or overarching themes.

The ten axial codes that emerged from the data over multiple cycles were: 1) Assessment-Placement Test, 2) Community College Perception, 3) Course Placement into Developmental Education, 4) Home Community, 5) Pre-College Schooling, 6) Racism, 7) Student Knowledge,

8) Support and 9) Transfer. These ten axial codes represented overarching themes derived from iteratively analyzing interview transcripts over multiple cycles. I reviewed the findings derived from the accumulation of recurring categories, which emerged or were supported by the data through multiple comparisons (Merriam, 2009). Of note, I conducted axial coding with the assistance of NVivo, exclusively since all transcript data and codes were stored in the software.

As Merriam (2009) stated, “when nothing new is coming forth” (p. 192) from the data and categories were collapsed as much as possible, the point of saturation has been reached. I then shifted to developing inferences, models, and attempts at generating theory (Merriam, 2009). “Thinking about data—theorizing—is a step toward developing a theory that explains some aspect of practice and allows a researcher to draw inferences about future activity” (Merriam, 2009, p. 188). In line with Merriam’s (2009) description, a qualitative data analysis methodological approach allowed me to make inferences, even theories, about practices and future actions within this dissertation study.

Trustworthiness

To ensure trustworthiness, also referred to as validity or credibility, several strategies were implemented. I used a researcher journal (e.g., field diary) as a reflexivity strategy to identify my biases (Merriam, 2009). Also, providing “detailed or thick” descriptions of the data developed trustworthiness. I developed, as Merriam (2009) suggested, “a highly descriptive, detailed presentation of the setting and, in particular, the findings of a study” (p. 227). Doing so facilitated transferability (Lincoln & Guba, 1985) for future researchers who must decide whether the study applies to the new purpose or situation at hand (Merriam, 2009).

Another approach to establishing trustworthiness was peer debriefing. A doctoral student enrolled in the School of Education served as peer examiner during the dissertating process

(Creswell, 2013). The peer debriefer was further along the dissertation research stages than I was. Like me, the peer examiner conducted a qualitative dissertation study, which included interviews with participants. Further, the peer examiner reviewed transcript excerpts for this study. The peer examiner provided feedback and posed insightful questions about my approach, as the researcher, through all stages of the dissertation project.

Triangulation was also conducted to ensure trustworthiness. Triangulation refers to using documents, data, or other interviews to corroborate or refute what is learned during the interview process (Creswell, 2013). Triangulation occurred by collecting and analyzing data from various sources (Creswell, 2013; Merriam, 2009). Data sources included participant interviews and examining documents collected. For instance, official policies about using A & P on campus were examined to triangulate students' interview responses in this study.

Chapter 4: Findings Chapter

The findings chapter begins with an overview of study participants. Then, a snapshot of Sunshine Community College's (SCC) advising structures and procedures are furnished. Finally, the overarching findings that emerged through the iterative process of qualitative data analysis are presented. The following research question guided this dissertation:

How do Latinx California community college students experience assessment and placement policies and practices?

Student Participant Characteristics

This section begins by presenting the characteristics of the fourteen students in this dissertation study. The majority of student participants enrolled in either the fall of 2017 (5) or 2018 (7) (See Table 4). One student enrolled during the fall of 2016 and another in the spring of 2018. The majority of students (11) in this study were enrolled in their first or second year at SCC. Of note, three students had started their third year of enrollment at SCC, which was beyond the one or two years indicated in the dissertation study's criteria. Students who were in their third year of coursework at SCC were included in the study. These students had originally qualified for the two years of enrollment established by this dissertation study's criteria, however, research was paused during the fall of 2018 and resumed in the spring of 2019, which led to students entering their third year of coursework. Half of students, seven of fourteen, did not prepare for the mathematics placement test. Seven students who did prepare shared a range of strategies to study for the placement test. The most prominent method of studying for the placement test was to review high school mathematics materials. For example, three student participants prepared for the placement examination by reviewing materials from high school mathematics courses. Only one of fourteen participants took the placement test a second time.

Table 4*Student Participant Characteristics*

Student	First-term enrolled	Year enrolled	Course placement outcome	Placement test preparation	Retest
Hilda	Fall 2018	1st	Elementary Algebra	HS math textbook	None
Ines	Fall 2018	1st	Pre-Algebra	None	None
Kiara	Fall 2018	1st	Intermediate Algebra	Math refresher course	None
Gema	Fall 2018	1st	Algebra & Pre-Statistics	Other college' study guide	None
Brisa ^a	Fall 2016	2nd	Pre-Algebra	None	None
Dario	Fall 2017	2nd	Pre-Algebra	None	None
Elias ^b	Fall 2017	2nd	Elementary Algebra	None	None
Jade	Fall 2018	2nd	Intermediate Algebra	Review notes from HS math courses, math refresher course, website	None
Leo	Fall 2018	2nd	Intermediate Algebra	None	None
Mia	Fall 2018	2nd	Elementary Algebra	Review notes from HS math courses, website	None
Olivia ^c	Spring 2018	2nd	Pre-Algebra	Placement test recall, tutoring	Retest
Nora ^d	Fall 2017	3rd	Pre-Algebra	None	None
Pablo ^e	Fall 2017	3rd	Elementary Algebra	None	None
Rogelio ^f	Fall 2017	3rd	Intermediate Algebra	None	None

Note. *Student* refers to the pseudonyms used to maintain participant confidentiality. *The first Enrollment Term* refers to when students initially matriculated at Sunshine Community College and were confirmed by institutional reporting. *Year Enrolled* refers to the number of academic calendar years that have transpired since the student participant first enrolled at SCC based on the interview date. *Course Placement Outcome* was gathered from students' interview data. Entries with "HS" refer to an abbreviation for high school.

^aBrisa interview data suggested she enrolled in the fall of 2016.

^bElias placed into Elementary Algebra but opted to enroll in Pre-Algebra because it was easier.

^cOlivia did not prepare before taking the placement test the first time but did so before retesting.

^dNora was at the start of her third year of enrollment at SCC when the interview was conducted in the fall of 2019.

^ePablo was at the start of his third year of enrollment at SCC when the interview was conducted in the fall of 2019, but he was contacted for the first time during his second year.

^fRogelio was at the start of his third year of enrollment at SCC when the interview was conducted in the fall of 2019. Still, he was contacted for the first time during his second year.

Student participants received course placements and enrolled in basic skills mathematics coursework ranging from Pre-Algebra to Intermediate Algebra. About a third of the students (5) in this study were placed into Pre-Algebra. Only one student participant was placed into Algebra & Pre-Statistics. Slightly less than a third of student participants were assigned to Elementary Algebra (4) and Intermediate Algebra (4). Table 4 summarized student participants' course placement outcomes, which can be referred back to throughout the chapter.

Overview of Findings

Three unique themes emerged from the data that delineated how SCC Latinx students experienced A&P policies and practices under the Student Success Act of 2012. The three themes were: *institutional barrier to course enrollment*, *determined mathematics proficiency not reflective of perceived skills*, and *varying reliance on unsound placement tests*. In the next sections the three overarching themes are illustrated in detail.

Institutional Barrier to Course Enrollment

The first theme, *institutional barrier to course enrollment*, indicated that SCC established A & P as a compulsory prerequisite to register for a mathematics course for incoming students. While SCC could administer a placement test to students in order to assess their mathematics skills according to the Student Success Act of 2012, it was not meant to be used alone. Enforcing only one mathematics assessment measures was contrary to the Mexican American Legal Defense and Education Fund's (MALDEF) settlement with the Chancellor's Office, which intended to remedy disparate impact on Latinx students as a result of a standardized examination

(Hughes & Scott-Clayton, 2011; Los Angeles Times, 1991). As part of the agreement to drop the lawsuit MALDEF required that CCCs move away from placement testing and use at least two assessment measures, or multiple measures, to evaluate student's skills and determine access to coursework. However, in practice SCC, along with most CCCs (Rodriguez et al., 2016), did not use more than one measure in order to place students into coursework. As will be shown, SCC overwhelmingly communicated to students that the placement test was required and did not advise students that there were alternative assessments that were non-test methods of course placement or the potential for developmental education enrollment. In the following section, the accounts of students are presented as exemplary in describing this finding.

Every student participant was asked about what they thought the point of the placement test was. Though the language used in their responses varied, all fourteen students in this study consistently expressed that the examination was a requisite to enrolling in a mathematics class. In what follows a few of the different responses student participants provided are presented. Elias first enrolled at SCC in the fall of 2017 and was in his second year at the time of the interview. Elias experienced going on campus for the first time with the intention of enrolling in a mathematics class the following way:

I kinda just walked. I went to the college down in Sunshine, and I asked if I can, like, somehow enroll to, like, any kinda math or English class. And they had me take the English placement test and the math one. So, I just took it on their computer, and they signed me into my [SCC online portal] and let me take the test there. [...] To like, see how my English skills and math skills are still. Mostly to like, give me an idea of where I wanna enroll. And what I need to take.

SCC personnel referred Elias to placement testing before allowing him to register for courses. Based on the information SCC personnel provided, Elias believed the placement test would help him determine the mathematics class he “need[ed] to take.” Elias counted on SCC personnel to inform him what his mathematics skills were and which class he should register for. SCC required Elias to take the placement test before registering for classes and provided little information about the A & P mechanism or his options.

SCC personnel conducted outreach at Hilda’s high school in order to matriculate prospective students and as part of it administered the placement test. Hilda was a soft-spoken first-generation college student who enjoyed creative writing. Based on information Hilda gathered from SCC staff she believed the placement test’s goal was the following: “Uh, to just kind of see where I was at. [...] Um, like, where, I guess where I would be placed in math. Like, what I knew, what I didn’t.” Hilda believed that SCC required the placement test in order to determine which specific mathematics class she would be granted access to enroll in at SCC.

Brisa was also required to take the placement test when SCC staff conducted outreach at her high school. Brisa spoke Spanish and English and was in her second year at the time of the interview. The information SCC personnel administering the placement test provided shaped Brisa’s understanding of the purpose of the placement test, which “was to know what classes to take at the college.” Brisa believed that the placement test would be the determinant of which mathematics course she would enroll in at SCC. In essence, Brisa believed that SCC had the power to dictate which mathematics class she would be placed into.

Ines, a student at SCC who first enrolled in the fall of 2018 had a similar experience. Based on information SCC personnel provided Ines she believe the following about placement testing:

Um, well, basically after the placement test they [SCC personnel] just told me I scored, like [...]. They gave me the score I scored in and basically that number they give you had to do with what math level you were placed in. [...] Basically the numbers were from like one to zero or-, I mean one to (laughs) zero to 100 or 100 and above. [...] So, it just depends how much you got and that's when they would place you. [...] 'Cause they have like, the math levels in order and the scores next to it. [...] So, that's how they placed me on Pre-Algebra.

Ines remembered the range of scores that were presented to her after taking the placement test and that those numbers. She also recalled that placement test scores corresponded with mathematics courses. The placement test score Ines received meant that SCC relegated her to Pre-Algebra, the lowest course in the developmental education course sequence.

Kiara was enrolled in her first year at SCC. Due to details provided by SCC staff Kiara gathered that, "you were just gonna take it [the placement test] and then it was gonna place you into, uh, the math class that, you know, you were-, you should be in." Kiara's statements were brief, just as brief as the details she received about the placement test. Kiara showed that SCC staff reinforced the idea that the placement test was used to decide what mathematics class students would be placed into.

Leo was enrolled in his second year at the time of the interview. Leo explained that the SCC outreach counselor introduced the placement test and said that he "needed to take these test and they'll like, um, determine which class you'll take in the college." Leo believed the placement test would place him into a math class at SCC. According to student's lived experiences, SCC staff consistently communicated that the placement test was a requirement or pre-requisite to enrollment in mathematics coursework and that its purpose was to measure their

mathematics skills in order to place them into a mathematics class. Students were eager to complete A & P as soon as possible in order to register for mathematics courses and begin their transfer journey. Hence, students in this study experienced A & P as perfunctory, or, a routine step to matriculation.

Another example of SCC's practice of requiring students to take the placement test prior to being allowed to enroll in a mathematics class was through a condensed list of matriculation steps presented on publicly displayed on standing sidewalk signs, also referred to as posters. While information about matriculation steps was available within the pages of the campus catalog, schedule of classes or the campus website, it was also prominent and on display as self-standing sidewalk signs. Matriculation posters were strategically placed on walkways in front of campus locations students frequented during matriculation like, the Admissions & Records Office and the Education Support Office. A matriculation poster was a prominent form of academic guidance communicating critical A & P policies to students without having to meet with SCC personnel or navigating institutional catalogs or websites. There were a total of five steps listed within SCC's matriculation sign in numerical order. The matriculation poster indicated with a number "1" that the first step to successful matriculation for students was applying for admission at SCC. With a number "2" the sign indicated that the second step students needed to complete was an assessment for course placement.

Mia was one of two student participants who recalled seeing the matriculation poster around campus. Mia was enrolled in her second year at the time of the interview. Mia examined and reflected on the enrollment steps she completed to matriculate at SCC, she recalled seeing matriculation signs on campus. Mia said, "we would have, like, pictures around all, like, the school buildings and it'll tell you first, apply, and then it would-, like, it would give these steps."

Mia recalled seeing “pictures,” referred here as a poster, that indicated that the matriculation steps needed to be completed in a sequential order.

Dario was the second student to recall the matriculation sign on campus. Dario was enrolled in his second year at SCC and preferred to speak Spanish throughout the interview. Dario went a step further than Mia because he explained the order of the steps that were on the poster by saying the following:

Um, there’s five steps. I don’t remember them very well but it is (laughs) in a sign here. [...] Well, I believe that what was first to come here below [referring to the floor below]. There is a compu-, there are computers that are like to see your level. They see your level. No, first you register.

Dario corrected himself as he explained the order of the specific steps that needed to be taken in order to receive a course placement and enroll in the first mathematics class. Dario indicated that registering at SCC came before taking the placement test. Dario’s experience suggested that the steps on the matriculation poster needed to be followed in order of appearance. For instance, students were directed to matriculate at SCC then go downstairs to the Assessment Office in order to access the computers that would help to “see your level.” Dario referred to computerized placement testing and the resulting mathematics course placement. In turn, at SCC the second step, assessment, was synonymous with placement testing, which needed to be completed prior to enrolling in a mathematics course. SCC’s presentation of matriculation steps in sequential order suggested that SCC barred student from meeting with a counselor, developing an educational plan, or enrolling in mathematics coursework until they took the placement test. Additionally, neither SCC personnel nor the matriculation poster advise students that there were alternative assessments that were non-test methods of course placement. The Student Success

Act of 2012 required that CCCs offer alternative assessments to A & P. Alternative assessments included interviews with SCC staff to ascertain student's mathematics skill level as well as high school coursework. For instance, students could avoid taking the placement test by showing that they passed an Advanced Placement test in mathematics during high school. The matriculation poster reinforced the advising student received from SCC personnel that A & P was a routine step in the matriculation process students should follow with little context as to what each step entailed, its consequences, or alternative assessments.

Placement testing acted as an institutional barrier because students in this study had little understanding of its main consequence, developmental education coursework. Students were not advised that their course placement was a basic skills course that would not count towards transfer. Leo was "not sure" whether Intermediate Algebra earned transfer credit Hilda believed that the "lower maths," like, Elementary Algebra and Intermediate Algebra were courses that received transfer-credit. In essence, Hilda believed that all mathematics courses in the sequence had transfer-level credit. Kiara drew more distinction between courses. Kiara did not "believe Pre-Algebra ha[d] transfer credit" but was sure that Intermediate Algebra was transferable. Kiara was only partially correct since Intermediate Algebra was not transferable. Rogelio explained that Intermediate Algebra, his course placement, was not transferable and that he found that out from friends who had lower course placements and from his counselor who told him to take Statistics because it was transferable.

Students in this study incorrectly identified mathematics courses as transferable when they were developmental education. Even after having enrolled into mathematics coursework student participants were uncertain about which courses were at transfer-level and conversely which were developmental education classes. Students in this study experienced A & P as a

process that would place them into a mathematics coursework and was void of consequence. Placement testing acted as a barrier to course enrollment, especially into transfer-level courses. As first-generation college students, participant's experiences suggested that they were unable to readily delineate the entire transfer journey because SCC did not support them in seeing the larger meaning behind A & P.

Summary

The first emergent theme, *institutional barrier to course enrollment*, revealed that SCC consistently required students to take a placement test before enrolling in mathematics courses. Hence, placement testing acted as an institutional barrier to course enrollment. Further, even though the Students Success Act of 2012 included alternative non-standardized means of assessing student's mathematics skills they were not promoted with the same zeal by SCC staff or on the matriculation sign. Student participants were willing to complete A & P in order to be able to enroll in mathematics and start working toward transferring to a four-year college. However, students in this study were uncertain about which courses were considered developmental education and which transferred.

Determined Mathematics Proficiency Not Reflective of Perceived Skills

The second overarching theme in this study was *determined mathematics proficiency not reflective of perceived skills*, which pointed to A & P outcomes incorrectly ascertaining student's mathematics comprehension because the course placement was below the breadth of what they discerned as their existing knowledge. Students' mathematics proficiency referred to the standardized placement test's evaluation of a student's mathematics problem solving skills at one point in time and reflected by examination scores and course placement. The standardized placement test was limited to the evaluation of students based exclusively on the mathematics

skills they were able to recall as they attempted to solve mathematics problems. On the other hand, students' perceived skills referred to the vast breadth of mathematics knowledge and problem-solving skill set students knew that they had accumulated throughout their educational journey, especially during high school. Differentiating between mathematics proficiency and perceived skills illuminated a pattern prevalent in the data, a mismatch between the skill set students could recall on placement test day and the breadth of knowledge they thought they possessed. This was evidenced through student experiences with course placement as a review of prior mathematics content learned in K-12.

Eight out of fourteen student's experiences suggested that the standardized examination determined their mathematics proficiency at a course placement that was a review of high school mathematics content. The difference between what the placement test deemed students mathematics proficiency level to be and their own perceived skills in practice became evident after enrolling in their assigned course placements. Six student participants literally used the word "easy" to describe their course placements academic challenge and another two said they knew half or more of the course content. Hilda, a student at SCC, aspired to work in the field of medicine and found excitement in an academic challenge. When asked whether she thought her course placement was appropriate Hilda shared the following:

I feel like, Elementary Algebra was a little too easy for me. Intermediate Algebra's definitely more challenging. And I feel like, I'm more, um-, I pay attention more because it's like, challenging. [...] I feel like, Elementary Algebra's more for kids who didn't do-, um, like, who only did the two years of math in high school, and who didn't do the four years. I did like, four years of math in high school. And so, I feel like, for me, I probably wouldn't have needed it.

Hilda was firm that Elementary Algebra was “a little too easy” throughout the interview and that it was a review of high school mathematics content. She added that her mathematics skills expanded after enrolling in Intermediate Algebra. Hilda preferred to be challenged academically believed she could have been successful in Intermediate Algebra without enrolling in her course placement, Elementary Algebra.

Mia, a student participant, first enrolled at SCC in the fall of 2018 and was in her second year at the time of the interview. Mia shared the following about her course placement:

Mia: And when I went to that class, it was super easy. And I couldn't get to another math class because based on my grade of the test. So, yeah.

Interviewer: And [...]. Um, okay. So, um, you said the Intermediate Algebra was too 'easy.'

Mia: Mm- hmm. It was like Algebra essentials. [...] Yeah. And I was, like, already in a class in my high school days. So I already pretty much already knew the basics.

Based on Mia's account the placement test underestimated her skills since the course placement she was assigned to was “super easy.” Mia felt that she could have been successful in a more advanced mathematics class in the sequence (e.g., Intermediate Algebra). But the placement test relegated Mia to a class that was below what she perceived to be her breadth of knowledge acquired during high school.

Ines, a student participant, was in her first year at the time of the interview. The last mathematics course Ines completed in high school was Algebra 1, which was equivalent to Elementary Algebra at SCC. However, Ines was placed into Pre-Algebra, which was one level below Elementary Algebra on SCC's sequence of classes (See Table 2). Ines expressed how she felt after enrolling in her assigned course placement:

At first I felt kind of nervous and I didn't know what I was gonna really get into. But then, when I noticed that, like the first day was like, really easy for me. I felt like it was too easy. And like, towards the end I did notice that I would need a lot of help [...].

When Ines first enrolled in her course placement, Pre-Algebra, she felt “nervous” because she did not “know what [she] was gonna really get into.” Prior to enrolling in her course placement Ines had little information about what the course content would entail and was unable to ascertain whether she could complete it successfully. Ines’ fear quickly dissipated on just her “first day” of class when she realized the material presented by the instructor was “really easy” because it was similar to the already covered in high school. After starting the class Ines felt very frustrated at being required to repeat content from high school since her perceived skills were beyond those necessary for the course. Though Ines admitted that the tail end of the semester presented a challenge due to having to submit homework online which made it difficult to receive feedback. Ines was confident that she could have been exempted from Pre-Algebra and placed directly into Algebra & Pre-Statistics, which would have saved her an entire semester of mathematics coursework. Ines’ experience suggested that the placement test’s determined mathematics proficiency was not in alignment her perceived breadth of skills which reflected a more advanced mathematics course would have been appropriate.

Two student participants shared that they knew half or more of the material covered in the course they were placed into. Gema first enrolled at SCC in the fall of 2018 and was in her second semester at the time of the interview. Two family members who had attended a different community college introduced Gema to the placement test and its purpose. Gema’s sibling encouraged her to prepare for the placement test because it would lead to “totally different classes.” Gema prepared for the placement test using a study guide from her sibling’s community

college. While Gema did not refer to the mathematics course she was placed into as “easy,” she felt it was unchallenging and a review of high school mathematics. Gema recalled, “I actually got told n-, numerous of times by my teacher that I shouldn’t be in that class [Algebra & Pre-Statistics] [...] ‘cause I knew a lot of the material.” Gema’s mathematics instructor repeatedly assessed her skills as being beyond the placement test’s determined mathematics proficiency level. Students who found the class they were placed into to be “easy” or where they knew about half or more the material covered were in effect repeating Algebra content learned in high school, which signaled under-placement.

Leo also expressed that his course placement was not reflective of the breadth of skills he believed to possess. After enrolling in his course placement, Intermediate Algebra, Leo recalled:

Leo: Um, I guess I felt pretty like, like comfortable. ‘Cause I’ve- when I took the class there’s some things that I already knew like, that I learned back in high school. So ...

Interviewer: How much do you think of the-, of the class, did you already know?

Leo: ... Um, knew like about half the stuff honestly. But it was still-, I’m not saying like it was easy ‘cause it was like still kind of challenging. But there’s some things that I would like recognize right off from like things I did in high school.

Leo was reluctant to call his course placement an “easy” class but felt that he “honestly” knew about half of the course content. Leo was “comfortable” with Intermediate Algebra because it repeated mathematics class content from high school. Student’s experiences after enrolling in the assigned course placement as “easy” or repeating course content suggested that they were under-placed, that is, sorted into courses that were below their perceived breadth of mathematics skills. While retaking the placement test was an option, at SCC A & P policy called for students to gain approval from a counselor and a statement explaining their reasons for taking the exam a second

time. Only one student in this study retested (See Table 4) and a more widespread use of this policy could have provided more accurate course placement outcomes.

Four students who did not study for the placement test believed that doing so might have helped them secure a more advanced course placement. These students believed that studying for the placement test would help them practice problem-solving skills and review mathematics content learned during high school. For instance, Nora said the following about preparing for the placement test if she had the opportunity to do A & P over:

Um, I would probably have, um, done like a review about it ‘cause I did not study at all. I didn’t have like any kind of, review. So I feel like I would have definitely reviewed the math portion, and I would have, um, tried to, like be more, um, be less nervous ‘cause I was super nervous.

Nora wished she had studied for the placement test in order to be less “nervous” while taking the placement test and in turn to be able to perform at higher levels.

However, even when student participants studied for the mathematics placement test perceived under-placement occurred. Four out of six students who studied for the placement test still expressed that the class they placed into was “easy” or felt that they had mastered half or more of the content because it was covered during high school. Hence, even after studying, the placement test incorrectly assessed their perceived mathematical skill set and under-placed them into mathematics coursework.

Student experiences suggested that they needed more information about A & P, specifically standardized placement testing, in order to prepare. For instance, Mia studied for the placement test but when asked how she felt before taking the examination said, “I was feeling not so good because I didn’t know what kind of problems I would have to solve.” Mia felt that

she did not perform well on the placement test because she did not know what “kind of problems” would be included ahead of time. Mia independently reviewed for the placement test using her notes from high school mathematics courses and a website (See Table 4). However, Mia did not know what specific content she needed to know in order to problem solve.

As seen in Table 4, of the seven student participants who prepared for the placement test, only two used an SCC resource. Student participants did not have the information necessary to appropriately study for the placement test at SCC. Having appropriate information about the specific mathematics content on the placement test could have been key to preparation and course placements that reflected student’s perceived breadth of mathematics skills. A & P acted as an institutional roadblock for students in this study because the placement test under-placed them into courses that were not reflective of their perceived breadth of mathematics skills, which meant they could have begun in a higher course placement as well as reduced the number of courses and semesters enrolled.

Summary

In sum, as evidence from the narratives, student participants perceived that the placement test consistently assigned them to a mathematics course that was equivalent to or less advanced than the last class Algebra they were enrolled in during high school and were in essence under-placed. The second theme, *determined mathematics proficiency not reflective of perceived skills* revealed that student’s mathematics course placements were not reflective of their own discerned breadth of skills, hence, students experienced under-placement. The pattern of under-placement was perpetuated because it was only after enrolling in the assigned mathematics class that students were able to recognize that the content comprising the course had already been learned in prior high school coursework. Students experienced A & P policies and practices that

incorrectly determined their perceived skills which were not reflected in course placements. Even when students prepared in advance for the placement test, they still experienced course under-placement. Patterns of under-placement for the students in this study were evidence that there was a gap between the placement test's determined mathematics proficiency and their perceived breadth of skills.

Varying Reliance on Unsound Placement Tests

The third and last theme revealed how students experienced A & P as a *varying reliance on unsound placement tests* because SCC's A & P policy limited student's choice in selecting mathematics coursework by requiring them to take a placement test that was a weak measure. This section begins by highlighting student's understanding that placement testing was not a sound instrument. Then presents student experiences with SCC staff foregoing a review of high school transcripts under the campus developed MM policies in favor of placement testing. Finally, students reflect on how peers were placed into mathematics coursework without going through placement testing.

Four out of fourteen students discussed in the interview how the placement test was unsound. Rogelio's experience exemplified student participants' understanding that A & P was not sound. Rogelio enrolled at SCC in the fall of 2017 and enjoyed learning mathematics. Rogelio reflected on what he learned about the purpose and validity of the placement test on the day SCC staff visited his high school to matriculate students:

Well they [SCC staff] told us just like the placement test into [...] the math you-, you'd be given [...] and stuff like that. [...] They didn't really go over too much about it [the placement test] [...] 'Cause it [the placement test] was based on your current grade level, your current classes. [...] It's not really a good placement test, though,

just to see if you're qualified for the math you're gonna go into.

The placement test was “not a really good” one to Rogelio since the standardized examination students were administered was dependent on the high school mathematics class they were enrolled in at the time. For example, Rogelio was given a placement test that aligned with the high school course he was enrolled in, Algebra 2, rather than one that assessed his preparedness for the next course in the sequence, Statistics or Trigonometry. Rogelio pointed to A & P as a mechanism that required students to repeat high school mathematics coursework for which they already developed the needed skills instead of assigning them to more advanced courses.

Ines was a first year student at SCC who questioned how sound the placement test was.

Ines said the following about the placement test:

And, um, so it was really easy enrolling into community college because they [SCC outreach staff] would be there to like, help us. And they would tell us what exactly to write and stuff. And they [SCC outreach staff] helped me like, know what classes to take. And like, my first math class, it was Pre-Algebra, and I remember I started it, and I was like, ‘why am I in this math class?’ I already did this.’ I finished Algebra 1 when I was a junior [in high school]. But, I feel like, I only got placed there because the placement tests. They didn't really like, they weren't really good.

Since she took Algebra 1 during high school Ines expected to enroll in a more advanced course at SCC. But, her course placement made her question “why” she was in Pre-Algebra, a class that was below the high school Algebra 1 she completed. Ines had a sense that the placement test was not “really good” at sorting her into coursework.

Mia talked about her peers when reflecting about the outcomes of the mathematics placement test:

Mia: Because even smart people, like, they would take the placement test, and they would get a low score when they're like really smart.

Interviewer: What do you think that's about?

Mia: I don't know. They probably get press-, not-, they've probably feel pressured or too much going on.

Mia explained that "even smart people" received "low" scores on the placement test. Mia suggested that placement test outcomes may not be sound since peers she deemed as having the mathematics skills to be placed into advanced mathematics coursework were sorted in less advanced courses. Mia thought that the placement test might not have accurately assessed their skills because of the stress they were under.

As Dario shared on his experience with A & P he expressed his thoughts on the accuracy of the placement test:

Well, I don't believe that they [placement test results] are very certain because machines sometimes they-, they don't lie but I don't believe they take very well, honestly. [...]

Because they can know your level, its like not your level, but you can be given an exam and as you get some wrong, its like if I get one wrong from Statistics I'm not at that level.

But if I did know them and for some reason I forgot how to do it, it like, they automatically put you at that level. Because you did not know how to do it, its like, you don't remember how to do it, but you did know how to do it. [...] In contrast, if you go with a person and they have you take classes and they take time with you that person will more or less know what level you are at or what you know. And even though I think well of the computer thing because like I said my friend, his knowledge is high. I recognize that because we took mathematics together. He helped me with mathematics in high

school. And after taking the exam he went to Elementary Algebra.

While Dario recognized that the computerized placement test could sort students into classes that were appropriate with their skill level, as he thought was the case for his friend. Dario also recognized that computerized placement testing results could potentially have issues. Dario believed that the mathematics placement test could inaccurately assess student's skills. Specifically, if the mathematics placement test-taker did not remember how to complete a mathematics problem successfully even though they had mastered that material. Further, he shared that if an SCC staff would take time to assess a student's mathematics skills they would be able to determine their course placement. Dario believed that while the standardized placement test could be accurate, SCC personnel would be better equipped to assess mathematics skills through hands on exercises. These student participants shared glimpses of an understanding that has been solidified in the literature, that standardized placement testing is unsound (Bailey et al., 2010; Scott-Clayton, 2012).

Another example of a weak assessment measure was evidenced in student narratives which suggested SCC's lack of MM standards in favor of placement testing. SCC developed their campus-wide MM standards in order to respond to the issue of administering a placement test that was known to be unsound in the literature (Bailey et al., 2010; Scott-Clayton, 2012). However, despite twelve out of fourteen students in this study submitting their high school transcript and being eligible for holistic review under SCC's MM standards, SCC staff subjected all of them to placement testing, which was subsequently used as the primary means for placing them into mathematics coursework.

SCC staff inconsistently applied SCC's MM policies by opting to forgo transcript data in favor of traditional placement testing. At least half of the fourteen students in this study

completed an Algebra course during high school that, according to SCC's MM policies, made them eligible for automatic course placement into Elementary Algebra or Intermediate Algebra but the policies were not applied by SCC staff who directed them to take a placement test instead. For instance, Hilda submitted a high school transcript but it was not used to place her into a math course. Hilda said the following about what happened to her high school transcript, "Uh, well, they [SCC staff] did look at my transcripts. But, they [SCC staff] went off more on the entrance-, on the [placement] exam than what I took in high school." Hilda clearly recalled submitting her high school transcript to SCC personnel and that they disregarded her academic history. SCC staff used their discretion over A & P to place Hilda into a mathematics course based solely on placement test performance.

Rogelio recalled submitting his high school transcript to SCC but being directed to take the mathematics placement test. Rogelio said the following about what was done with the information SCC staff gathered on his high school transcript:

Rogelio: I think the only thing that went into my college credits was, mm, I took Spanish. And, I did the AP Spanish and it went to my college transcripts, I think. That was about it that went into it. [...] Yeah that was just it. 'Cause I think my English doesn't really go into it, just 'cause it automatically places you into already a class that gives you credits. [...] Um, I th-, originally I brought it in. [...]

Interviewer: And then, um-. Oh you said that there was a English class, and if you passed that English class you got into a certain level of English here at the community college. Was that the case for math as well?

Rogelio: Um, I don't think so, no. 'Cause you still had to take the placement test for math.

SCC personnel granted Rogelio college credit for a language requirement due to having taken an Advanced Placement Spanish course listed on his high school transcript. SCC staff also placed Rogelio into an transfer-level English course using his high school data. SCC personnel used the campus developed MM policies for English. However, Rogelio thought that MM measures review did not exist for mathematics since SCC staff did not use his high school transcript to place him into a mathematics class. SCC staff disregarded that he was enrolled in and near passing an Algebra 2 high school course that could have automatically placed him into Intermediate Algebra using MM policies. SCC personnel directed Rogelio to take the mathematics placement test which sorted him into Intermediate Algebra. Rogelio's experience showed that SCC staff inconsistently applied campus developed English and mathematics MM policies.

Jade recalled submitting a high school transcript that made her eligible for MM mathematics course placement but was instead referred to placement testing. Jade was enrolled in her second year at the time of the interview. Jade's counselor reviewed her transcript data in order to apply SCC's MM for course placement and saw that she was eligible for automatic enrollment into Algebra 2, but, instead referred to her placement testing. Jade received a "C" in high school Algebra 2 which made her eligible for automatic course placement into Intermediate Algebra, the highest basic skills class in the sequence. However, instead of honoring the MM based course placement, Jade's well-intentioned counselor encouraged her to take the mathematics placement test to determine whether she could score into Trigonometry. Trigonometry was the first transfer-level course in the STEM sequence (See Table 2). The placement test determined Jade's mathematics proficiency to be the same as it would have been with MM, Intermediate Algebra. Due to her counselors advice, Jade endured the uncertainty of

taking a high-stakes placement test when she could have avoided it altogether had SCC's MM policy been adhered to from the beginning. Though Jade was not aware, the SCC counselor may have put her at risk of placing into a class that was at a lower level than what the transcript indicated. For instance, if Jade's placement test sorted her into a lower level class than Intermediate Algebra the counselor might have decided to honor that outcome and prohibit her from enrolling in Intermediate Algebra. Jade's community college counselor revealed the subjective nature of A & P using MM. In the end, Jade's course placement was not based on consistent application of MM policies but dictated based on placement testing. Even though SCC's MM were implemented as a remedy to unsound placement testing, a lack of fidelity recreated another weak A & P measure and reinforced the practice of using placement testing exclusively.

Ines recalled that peers were placed into mathematics coursework based on high school transcript data and that they did not take the placement test. Ines submitted her high school transcript which showed that she had passed Algebra 1, the MM equivalent of Elementary Algebra, but was directed to take the placement test by SCC staff. Ines shared the following about her understanding of the use of high school transcripts to gain access to higher level mathematics classes:

Ines: I noticed that some [students] ... I don't even think they [students] did, like, the placement test. I think they [SCC staff] just went off based on their [students] transcript. [...] I think when they [students] just enrolled they [SCC staff] saw, like, that they [students] were-, they'd went more above Algebra [...] so, they [SCC staff] probably just started them [students] more ahead. 'Cause I know many people that I graduated with, um, they [students] already started at Statistics. Yeah. And it was probably because they

[students] were more advanced in high school.

Interviewer: Got it. Okay, so they [students] got their transcripts reviewed. ...

Ines: Yeah.

Interviewer: ... and then, they [SCC staff] put them [students] in that class?

Ines: Yeah.

Interviewer: Did they [students] have to take the placement test?

Ines: I don't think so.

Ines noticed that some of her peers who enrolled in a course above Algebra 1 during high school did not have to take the placement test, instead, SCC staff “just went off based on their transcript.” Ines believed that they did not have to take a placement test because they had passed a class beyond Algebra 1. Ines also thought that she was not placed into a mathematics class because she only passed Algebra 1 during high school. However, according to SCC’s MM policy students who submitted their transcript and passed Algebra 1 were eligible to be placed directly into Elementary Algebra without taking the placement test. Instead of enrolling into Elementary Algebra based on SCC’s MM policies, she took the placement test, which relegated her to Pre-Algebra, the lowest course in the mathematics sequence of classes. Ines’ experience showed that SCC staff’s inconsistent application of MM policies could negatively impact students by sorting them into lower course placements than they were entitled to due to a preference for placement testing.

The implementation of SCC’s MM policies ignored the ways in which SCC staff might continue to reinforce traditional A & P practices through a varying reliance on unsound placement tests which kept students from selecting their course placement. Though their experiences with A & P varied, all fourteen student participants accepted their placement testing

outcome. For instance, Mia indicated that high performing students experienced pressure during placement testing that may have lowered their outcomes, still, they accepted their course placements. In another example, even when Ines witnessed how peers were able to gain access to more advanced mathematics courses she did not advocate for a higher course placement but accepted being relegated to developmental education. Additionally, Ines' experience with A & P showed that when SCC staff did not use MM for course placement it could result in placement test outcomes that sorted students into lower coursework than they were eligible for. Ines experienced a matriculation process that was highly directed by SCC staff and expedited enrollment, but was missing important context (e.g., examination content) that first-generation students could use to make informed decisions and interrogate the course placement they were assigned and may have created an institutional barrier.

Though SCC was closer to providing a more holistic review of students mathematics skills with campus developed MM they continued the practice of administering an unsound standardized examination to incoming students. Dario believed the placement test was unsound and that a SCC staff member could do a better job of determining an appropriate course placement by spending time with a student. Further, Rogelio's experience suggested that SCC staff paid more attention to expediting student's placement testing than in engaging them in a conversation about aspirations for a mathematics course placement, academic major, or career plans. These examples revealed how power played out when assessing student's placement in mathematics courses. Institutional actors (i.e., counselors) possessed the power to determine which A & P policy to apply for students course placement. For the participants in this study, institutional actors overwhelmingly used their power to prioritize the use of an unsound standardized placement test. These examples of student participant's experiences with A & P

suggested that staff may have acted as physical embodiments of institutional structures which posed barriers for gaining access to transfer-level mathematics coursework due to a varying reliance on unsound placement tests.

Summary

The third and final theme, *varying reliance on unsound placement tests*, signaled that student participants had little discretion to independently choose their mathematics courses because SCC required a standardized placement test that was believed to be unsound in the literature and by some student participants. Four students called attention to issues with the standardized placement test they were administered. But, since placement testing was a required part of matriculation they accepted their course placements. Student participants relied on SCC's unsound placement test to correctly assess their mathematics skills without knowing that the examination inaccurately placed them into coursework. MM were introduced at SCC in order to bypass an unsound standardized placement test in favor of a more accurate assessment of student mathematics skills and subsequent course placement. However, SCC staff had the ultimate power to decide whether to apply SCC MM policies or direct students to an unsound placement test. Advisors often did not use other information such as high school coursework in placement decision even when the policy dictated they should. Moreover, student participants recalled that their peers were placed into mathematics coursework without undergoing placement testing. Student participants were unable to select which mathematics course to enroll in at the beginning of their transfer journey due to a *varying reliance on unsound placement tests at SCC*.

Summary of Major Findings

In this study, the three overarching themes were interconnected by participants' experiences with A & P. Student experiences were described by this study's three themes:

institutional barrier to course enrollment, determined mathematics proficiency not reflective of perceived skills, and varying reliance on unsound placement tests. The first emergent theme, *institutional barrier to course enrollment*, showed that while students were required to take a placement test they were not simultaneously offered alternative means of assessments with the same zeal, which was a part of the Student Success Act of 2012. Students consistently expressed that the placement test was required for them to register for a mathematics class. Though students experienced the placement test as perfunctory and as a one-time high stakes test that needed to be completed in order for them to enroll in mathematics coursework and beginning their transfer journey. Students looked to SCC personnel to guide them on where to start their transfer journey, with little awareness that the placement test had serious issues and consequences, like developmental education enrollment, added classes, and an extended transfer timeline which institutional agents downplayed. This combination of factors acted as an institutional barrier to student's mathematics course enrollment.

The second theme, *determined mathematics proficiency not reflective of perceived skills*, revealed that placement test outcomes incorrectly assessed students' cumulative mathematics skills since the examination underestimated more than half of student's perceived skills and under-placed them. These student participants were placed in a course that repeated mathematics content they learned in high school.

The third theme showed that student participants experienced A & P as a *varying reliance on unsound placement tests* at SCC because they had little discretion over choosing mathematics coursework and were administered a placement test known to be a weak measure. Additionally, SCC's implementation of MM in order to offset the negative impact of standardized placement testing on students was weakened by an inconsistent adherence to the policy by SCC staff. SCC

personnel did not use MM policy when though A & P policy called for it. Though peers were sorted into mathematics coursework based on high school data, student participants were not. Student participants could not opt out of undergoing an unsound A & P mechanism which limited their access to a transfer-level course placement due to a varying reliance on unsound placement tests.

SCC Personnel Perspective on Student Experiences with A & P

In gaining access to student participants and in trying to better understand the SCC context, I spoke extensively with three personnel (described in the methods chapter). The three SCC personnel, Clara, Fatima, and Amy, commented on how A & P functioned and reinforced student voices in the following ways. First, SCC personnel viewed student's experiences with placement testing as an *institutional barrier to course enrollment*. Clara, an administrator for the STEM Success Program, often took into account student's placement test experiences and outcomes when reviewing their academic plans for transfer. Clara stated the following about what students thought the purpose of the placement test was, "I think they [students] understand that [the placement test] is to put them into the correct math class. [...] Yeah, I think they pretty much understand what the test is for." In line with student participants, Clara shared that the purpose of placement testing was to place students directly into a mathematics course. Further, like the students in this study Clara did not mention A & P's consequence, developmental education course placement.

Additionally, Fatima was a tenure-track mathematics faculty member at SCC that understood student experiences with A & P to be an *institutional barrier to course enrollment*. Fatima spoke about the placement test step on the matriculation poster. Like students in this study, Fatima recalled that the ordering of SCC's matriculation steps barred students from

meeting with a counselor until they took the placement test. Fatima believed that a counselor intervention was necessary before students took the placement test, however admitted that doing so, “doubles the counseling appointment[s]” needed and would require additional financial resources. SCC’s limited resources for A & P created an institutional barrier that critically shaped student’s experiences prior to enrolling mathematics coursework.

Moreover, Fatima said the following about the ways in which the placement testing acted as personal obstacle for students:

I think that they [students] think [the placement test] it’s just another ‘barrier.’ [...] Um, uh, they [students] might not use the word ‘barrier,’ but it’s like, ‘Just another thing I have to do.’ [...] I think that once they [students] take it [the placement test], um, they feel smaller. [...] Um, I just think it’s an exercise in humiliation, honestly.

Though students experienced A & P as an individual activity, Fatima stressed that A & P was one of several institutional “barrier[s]” that played a part of matriculation. According to Fatima, SCC students were not able to discern that A & P was “only one piece of the puzzle” to matriculation. Importantly, Fatima suggested that student’s internalized placement test outcomes and having to enroll in developmental education classes as a reflection of their academic potential. Fatima went as far as to say that the placement test had a “humiliati[ng]” effect on students. Fatima shared that placement testing was an institutional barrier because it confirmed SCC student’s belief that they were not “good at math,” which prompted them to accept automated course placements into developmental education and being barred from enrolling directly into transfer-level mathematics courses.

Second, personnel were aware that students were under-placed, which aligned with the *determined mathematics proficiency not reflective of perceived skills* theme. Amy oversaw the

Education Support Office which provided information about the placement test, scheduled examination appointments, and presented students with results. Though not an academic counselor, Amy shared that she provided students with guidance after completing the placement test:

Um, uh, I know that once a student finishes the placement test and they-. You know, it has Pre-Algebra and the explanation of what Pre-Algebra is. ... Um, I typically kinda have to explain what that is and what that level is to them. [...] If it says Intermediate Algebra, they'll [students] say, 'oh, wh-, what does that mean? How did I do? Where did I place?' [...] I would explain what that sequence [of mathematics classes] is depending if they're a STEM student or they're going-, or they're non STEM student. And, um, quickly they, they, get what that is. And then their next discussion would be with their counselor were all of that would be elaborated for them and, and they would get a better understanding of what that means.

Amy indicated that after students took the placement test she would often take the time to explain what the outcomes meant what mathematics class they corresponded with. Amy's recollection of student experiences after placement testing suggested that they did not have enough information to understand its consequences nor which mathematics class they would be allowed to enroll in. Similarly, students in this study did not receive information to help them determine whether their mathematics course placement would repeat material covered during high school and did not realize under-placement occurred until after meeting with a counselor or enrolling in a mathematics class.

Also, SCC personnel (ie. Clara, Fatima) believed that students determined mathematics proficiency were not reflective of their perceived skills because of a lack of preparation for placement testing. Clara said the following about student's preparation for placement testing:

Um, 'cause I know I've had students in the math who just came in cold [without studying for the placement test] and they scored a lot lower. And it was just because you know, again, if you don't do math for a while, you-, you know how to do it, you just gotta refresh your brain, remember.

Clara believed students who did not study for the placement test were "cold" in their dexterity to solve mathematics problems due to underuse of the knowledge and skills. Moreover, students who did not study before placement testing would earn a "lower" score than they could have, which meant the course placement was not reflected of their perceived breadth of knowledge and under-placement occurred.

Additionally, Fatima recalled that a mismatch between students perceived mathematics skills and the placement tests determined proficiency. Fatima thought that students could be encouraged to study for the mathematics placement test by saying, "you haven't had math for two years, you should brush up just a little bit. [...] You'll place higher." Fatima believed that students who had not taken a mathematics class or practiced problem solving skills in some time would forget content learned but with some review could readily recall it, which could mean a more accurate as well as higher course placement for students. However, even though SCC personnel viewed studying for the placement test as a strategy to avoid under-placement, student participants who prepared were still under-placed into classes that covered content previously learned in high school.

The *varying reliance on unsound placement tests* finding was aligned with student participant experiences as well as SCC's Mathematics Department and personnel who considered the placement test to be an unsound way of placing students into mathematics coursework. Fatima, a mathematics faculty, was frank about the standardized placement test saying, "Um, if I thought the [placement] test was valid, I would probably feel differently about it, but I don't think the test is valid." Fatima expressed how she lacked confidence in the soundness of the placement test.

Amy, an administrator for the Education Support Office, which administered the placement test, also had concerns about administering an unsound placement test. Amy talked about the standardized placement test and the, then upcoming, statewide implementation of MM policy under AB 705 in the fall of 2019:

And I think the placement can, um, be a bit harsh on a student's confidence. [...] Because research shows that students do better when they're using their multiple measures, um, placements from high school. [...] as opposed to a placement test as a standardized test. So, for that fact, I'm very much looking forward to getting rid of the placement test, [...] and, um, using student's coursework from high school.

Amy was eager to eliminate the placement test so that student's course placement outcomes would improve when SCC personnel considered their high school academic performance and not their standardized placement test outcomes alone. Amy was the second SCC personnel to acknowledge that the standardized placement test administered to incoming students was unsound, yet it continued to be the primary method for assessing students' mathematics skill set. As previously illustrated, a handful of student participants shared Fatima and Amy's perspective

that placement testing was a weak assessment of mathematics skills, yet it continued to be relied upon for course placement.

Further, in alignment with student's lived experiences (described earlier), Fatima pointed out that despite the herculean efforts of the mathematics department to change A & P policies, counselors were reluctant to apply SCC's MM policies and opted to forgo transcript data in favor of traditional placement testing. As Fatima indicated, SCC counselors were reluctant to apply MM policies and used placement testing as a strategy to "drop" students' course placement "back" rather than help them access the highest mathematics course possible, which was the intention of the Student Success Act of 2012. This finding suggested that the Mathematics Department's attempt to remedy the negative impact of standardized placement testing by changing A & P policies to allow for MM at SCC years before the statewide implementation of AB 705 was hampered. SCC continued to rely on placement testing and inconsistently applied high school data in placement decisions. In sum, the three personnel who provided context for SCC and the A & P experience for students reinforced student participant's views of A & P as: 1) perfunctory, even, an institutional barrier, 2) leading to a repeat of high school coursework which signaled under-placement based on their perceive mathematics skills, and 3) as possessing little choice over what mathematics course to enroll in when SCC staff had a varying reliance on unsound placement tests. The next chapter discusses this study's findings, implications, and final conclusions.

Chapter 5: Discussion, Implications, and Conclusion

Community colleges across the United States that administer a standardized assessment and those using MM, like California, can learn from the experiences of Latinx students with A & P at SCC. Ensuring that Latinx students transfer and complete degrees is critical to fulfilling the over one million bachelor's degree deficit California faces by 2030 (Jackson et al., 2019). Latinx students are key to ensuring bachelor's degree completion which is tied to the economic prosperity of California and the U.S. overall (Jackson et al., 2019). Latinx, as a group, are forecasted to become a majority-minority in the U.S. by the year 2044 (U.S. Census Bureau, 2015a). In 2014, Latinx became California's majority-minority (Panzar, 2015; Resse & Magagnini, 2015; U.S. Census, 2015b). This study examined the ways in which Latinx first-generation community college students experienced assessment and placement (A & P) under the Student Success Act of 2012 which meant to increase transfer and degree completion. The three findings that emerged from the data were guided by one overarching research question:

How do Latinx California community college students experience assessment and placement policies and practices?

The Student Success Act of 2012 enacted monumental changes to matriculation, especially A & P, at CCCs in order to reduce the rate of developmental education enrollment and increase transfer to four-year colleges. The Student Success Act of 2012 intended to ameliorate the negative impact of placement testing on student transfer outcomes. Three themes delineated the experiences of SCC Latinx students with A & P policies and practices: 1) *institutional barrier to course enrollment*, 2) *determined mathematics proficiency not reflective of perceived skills*, and 3) *varying reliance on unsound placement tests*. In the next section, the three overarching findings are discussed in detail in relation to implications for practice, policy, and

future research. This study closes with final reflections on the future of A & P at community colleges.

Discussion

Institutional Barrier to Course Enrollment

SCC established an institutional barrier by preventing student participants from registering for a transfer-level mathematics class or any developmental education course above Pre-Algebra without first undergoing A & P. The first theme, *institutional barrier to course enrollment*, referred to SCC's requirement that students take the placement test prior to registering for a mathematics class. Student accounts revealed that SCC's matriculation poster, catalog, and personnel advised that taking a placement test was required before students could enroll in a mathematics course, see a counselor, or develop an education plan. Further, as evidenced from student narratives, SCC personnel advised student participants that the purpose of the placement test was to determine their mathematics skills and subsequent course placement (Park et al., 2013; Safran & Visser, 2010; Venezia et al., 2010). However, as previous research found, students were not advised that placement testing had a crucial consequence: that they would be enrolled in developmental education that provided no transfer credit and added coursework and semesters to their educational plan for transfer (Bailey et al., 2015; Park et al., 2013; Safran & Visser, 2010; Venezia et al., 2010). SCC's priority was to matriculate a large volume of students with a limited amount of time and resources, which meant that their right to receive transparent information about alternative assessment was obscured. This study supported previous research showing that CCCs, in this case SCC, used mathematics placement test as the primary requirement for fulfilling the A & P mandate and enrolling in a mathematics class (Rodriguez et al., 2016). This practice contradicted the Mexican American Legal Defense and

Education Fund's (MALDEF) settlement with the Chancellor's Office, that aimed to eliminate disparate impact on Latinx students due to standardized examinations (Hughes & Scott-Clayton, 2011; Los Angeles Times, 1991). SCC, along with all other CCCs, were supposed use at minimum two assessment measures, or multiple measures, to assess student's skills and course placement. But, in practice SCC and many CCCs (Rodriguez et al., 2016), continued to use a single measure to sort students into coursework, which was a potential violation of their right to a fair assessment under the Student Success Act of 2012, especially since alternative assessments were not prominently presented as an option.

As prior research suggests, student participants experienced A & P as perfunctory (Park et al., 2013), which helped obscure that it acted as an institutional barrier. While students felt uncertainty prior to, during, and after the placement test, none expressed defeat or were deterred from enrolling in mathematics coursework. Overall, student participants committed to improving on mathematics skills (e.g., Dario). Student participants chose to use developmental education course enrollment to propel themselves forward toward transfer. Students in this study saw their enrollment in developmental education courses as a badge of honor that would prove to four-year colleges that they had mastered the additional classes necessary to be eligible to transfer and were worthy of being admitted as a transfer student. While students were willing to see the silver linings of developmental education enrollment, placement testing acted as an enforced barrier that prevented them from accessing mathematics coursework.

Determined Mathematics Proficiency Not Reflective of Perceived Skills

As evidenced from the student narratives, there was a pervasive pattern of under-placing student participants into developmental education courses that were below their perceived level of mathematics proficiency. The second theme, *determined mathematics proficiency not*

reflective of perceived skills, was key because it showed that while A & P measured mathematics comprehension, outcomes did not match the breadth of mathematics knowledge students believed to have acquired in high school. More than half of students (6) were assigned into a class that was “easy” or where they knew about half the mathematics course content (2), which signaled that the exam had not assessed their perceived mathematics skills properly and that alternative assessments may made more accurate assessments of their skill set. The discrepancy between what the placement test calculated as students mathematics proficiency and what students’ perceived skills were was consistent with a pattern described in the literature as the under-placement of students into mathematics coursework as a result of placement testing (Bailey et al., 2010; Scott-Clayton et al., 2014). That is, students in this dissertation study were placed in a course that they perceived to be below their mathematics skills level. A & P was the primary mechanism by which SCC ensured a standard of academic rigor, however, more than half of the students in this dissertation study were not challenged by their course placement. Academic rigor was meant to place students into the highest course possible while simultaneously providing a high level of support in order to ensure their success. However, under the guise of academic rigor, SCC’s A & P standards hindered the success of students in this dissertation study.

Student participants only became aware that they had been placed into mathematics courses that were unchallenging or repeated content covered in high school after enrolling. More than half (8) of the students in this dissertation study were repeating Algebra content covered in high school. This pattern was not unique to the students in this dissertation study. Research conducted by Melguizo and Ngo (2018) showed that students consistently repeated Algebra content from high school during community college due to a misalignment in mathematics

standards that were reflected in the A & P outcomes of entering students. Further, Latinx students were more likely to be impacted by misalignment between their high school courses and A & P outcomes than their White and Asian counterparts (Melguizo & Ngo, 2018). Student participants' experiences with enrolling in SCC courses that repeated mathematics content covered in high school signaled that misalignment also occurred at SCC (Melguizo & Ngo, 2018; Park et al., 2013). Hence, SCC's A & P acted as a structural barrier for students entering community college, which directly impacted their goal of transferring to a four-year college due to course under-placement.

Varying Reliance on Unsound Placement Tests

The third finding, *varying reliance on unsound placement tests*, referred to A & P policies that provided students little discretion over their course placement because SCC administered a placement test that was known to be a weak measure. Placement testing was regarded as unsound by a handful of student participants and in the literature. The majority of community colleges across the country traditionally used standardized placement testing to sort students into developmental education (Parsad et al., 2003; Rodriguez et al., 2016; Woods, 1985). SCC's administration of a standardized placement test as the main measure of college-readiness was common practice at CCCs prior to the implementation of AB 705 (Rodriguez et al., 2016). For instance, about thirty CCCs administered the Compass to entering students (CCCCO, 2016) until 2016 when the placement test developer removed it from the market citing a detrimental impact due to (ACT 2015; Fain, 2015) course under-placement (Belfield & Crosta, 2012). If not for the elimination of the Compass, CCCs might still administer an unsound standardized placement test today. In the case of SCC, they continued to administer the ACCUPLACER despite research showing that it lacked predictive validity and erroneously

under-placed students into developmental education (Belfield & Crosta, 2012; Hughes & Scott-Clayton, 2011). While students in this study were not aware of these studies some recognized that there were issues with the accuracy of the placement test. As evidenced by students experiences in this study SCC's continued use of the placement test suggested that there was a varying reliance on unsound placement testing which posed a barrier to enrollment in transfer-level courses.

Varying reliance on unsound placement tests for developmental education course placement may have disadvantaged Latinx students who encountered limited college preparatory educational opportunities during high school. Several research studies found that Latinx students who took a standardized exam were disproportionately deemed academically underprepared for college-level courses by standardized A & P mechanisms which sorted them directly into developmental education (Dowd, 2007; Melguizo & Ngo, 2018; Scott-Clayton et al., 2014). Reasons for this overrepresentation in developmental education was partly due to Latinx students having less access to rigorous college preparatory curriculum than White peers during high school (Castro, 2013). Castro (2013) argued that college and career readiness interventions, like placement testing, was highly racialized and needed to account for structural inequality. Further, Kurlaender and Larsen's (2013) research found that Latinx students were more likely than White peers to be assigned into developmental education despite high school academic performance being held equal. In effect, K-12's subpar academic preparation of Latinx students had detrimental consequences for students entering community college, and undergoing A & P.

Another way a varying reliance on unsound placement tests was experienced by student participants was highlighted through the practice of forgoing campus-wide MM policies intended to remedy the negative impact of the examination. For instance, even though twelve of fourteen

student participants submitted a high school transcript and were eligible for course placement using SCC's MM policy they were all directed to take a standardized placement test. Further, the eight student participants who had their high school academic transcript data reviewed were also routed to placement testing. According to student accounts, SCC staff were reluctant to apply MM policies. This may have been due to multiple reasons. For instance, research showed that community colleges have had a low counselor to student ratio, thus, constraining the amount of time available for advising (Bailey et al., 2015). Additionally, prior studies suggest that counselors provide general academic information with little regard to student's specific needs or future plans (Park et al., 2013; Safran & Visher, 2010; Venezia et al., 2010). SCC staff's inconsistent application of MM standards made for another weak A & P measure and cemented the standardized placement test as the primary dictator of mathematics skills and developmental education course placement.

Student participant experiences provided a window into the ways SCC's varying reliance on unsound placement tests outweighed the implementation of locally developed MM policies, which may inform the statewide implementation of AB 705. The statewide implementation of AB 705's MM in the fall of 2019 was intended to provide a more holistic assessment of students mathematics skills, but more importantly, to eliminate the use of developmental education. While standardized placement testing reproduced disproportionate impact on certain groups of students, Latinx in particular, which resulted in high enrollment rates into developmental education. Emerging research on the impact of AB 705 showed that CCCs with higher concentrations of Students of Color were slower to adhere to MM policies in practice (Cuellar Mejia et al., 2019). Inequitable student outcomes by race and ethnicity may be an early indicator that MM as a means of A & P continues to perpetuate student disenfranchisement.

A factor that may contribute to CCC's inconsistent adherence to statewide AB 705 MM policies is that there are no uniform MM policies and practices in California (CCCCO, 2018a). Even though the Chancellor's Office established AB 705 standards for all CCCs to follow, in practice, each campus remains autonomous and holds discretion over the application of MM policies (CCCCO, 2018a). In other words, CCCs can deviate from the State's MM policies by modifying course placement standards for their local student population. For instance, institutions may select a higher grade point average than the State minimum for allowing students access to transfer-level mathematics courses (Cuellar Mejia et al., 2019). Prioritizing the autonomy of CCCs by allowing for divergent AB 705 MM policies may skew its implementation, reproduce structural inequality based on race and ethnicity, and may continue disenfranchisement through A & P.

Additionally, both SCC and the State of California missed the mark when applying MM policies. The Student Success Act of 2012 (California Legislature, 2017) and test developers (The College Board, 2021) called for placement testing to be used in conjunction with at least one additional measure (i.e., multiple measures) in order to ensure students mathematics skills were accurately measured. However, instead of administering the placement test in conjunction with MM, SCC used one or the other which replicated the issue of using a single A & P measure for determining students mathematics skills and course placement. Similarly, after the implementation of AB 705 the State of California replicated old inequitable patterns to sort student participants into mathematics coursework. As currently written AB 705's statewide MM policies are reduced to a one-step A & P mechanism (CCCCO, 2018b; California Legislature, 2017). AB 705 dictates that CCCs must use "one or more of the following: high school coursework, high school grades, and high school grade point average" to assess and place

students into mathematics coursework (California Legislature, 2017). In effect, through AB 705 the State once again sanctioned CCC's ability to apply only "one" A & P measure to determine students' mathematics skills. Reviewing only one high school metric for mathematics course placement falls short of providing a holistic assessment of student skills and may reproduce structural inequality through AB 705's A & P policies.

In line with existing research, students in this dissertation study shouldered the burden of proof (CCCCO, 2018a; Cuellar Mejia et al., 2020) when it came to enrolling into a course they were eligible for based on MM policies. Student participants were not in a position to advocate for course placements based on high school transcript data since they were first-generation college students with little institutional knowledge or access to individuals who could guide them (Collier & Morgan, 2008). Yet, student participants were responsible for submitting their high school transcripts in order to be considered for MM review. Nationally, nearly 65% of student enrollment is comprised of first-generation college students (Center for First-Generation Student Success, 2019a) who were less likely to enroll full-time or earn a bachelor's degree after six years (Center for First-Generation Student Success, 2019b). While first-generation college students were more likely to access financial aid services than continuing-generation peers, they received academic advising and academic support services at lower rates (Center for First-Generation Student Success, 2019c). In California, about forty percent of CCC students are considered first-generation college students (Community College League of California, 2019). Due to their first-generation status students may be unable to glean an institution's expectations for academic success, hence, access to formal guidance in A & P is critical (Collier & Morgan, 2008). Under AB 705 the burden of proof has shifted from students to CCCs. CCCs must prove that students will not be likely to "succeed" in a transfer-level mathematics course before

relegating them into developmental education (California Legislature, 2017), which may especially serve first-generation Latinx students who were the plurality of enrollment and most likely to be sorted into developmental education.

Implications for Practice

The findings of this study uniquely inform institutions across the country and within the CCC system regarding A & P practices because of its insights on students' experiences with mathematics standardized placement testing and MM. While this dissertation documented the use of a single standardized examination for A & P, it also gathered initial insights about students' knowledge and experience with the MM policies developed and administered at SCC before AB 705's full implementation. Whether administering a standardized placement test or MM, community colleges must be keenly aware of and informed by the lived experiences and knowledge that students in this dissertation study have to offer (Bailey et al., 2015; Park et al., 2013; Safran & Visher, 2010; Venezia et al., 2010). For instance, student experiences can directly inform community college's efforts to halt under-placement, repetition of high school mathematics coursework, and disenfranchisement.

States that still administer a standardized placement test can periodically examine A & P quantitative data in order to adjust placement test cut-off scores and place students into more advanced courses (Collins, 2008; Melguizo et al., 2013b; Safran & Visher, 2010). However, SCC and community colleges across the country can keep a closer pulse of the accuracy of cut-off scores by listening to student's lived experiences. Often times, as is the case with A & P at CCCs, policy and practices do not match, which is why student's experiences are important. Student experiences reflect what happens in practice when policies like the Students Success Act

of 2012 and AB 705 are implemented. Learning from student experiences can also allow for swift and timely course correction in order to remedy potential harm at its onset.

In order to prevent students from enrolling in an unnecessary course, whether administering a standardized placement test or using MM, SCC as well as other community colleges could invest in three practices. The first is to present students with the SCC sequence of mathematics courses prior to matriculating in mathematics coursework or taking the placement test. Exposure to the mathematics course sequence would allow for SCC, and other community colleges, to consistently explain the different classes, content, and impact on students educational plan and time to transfer.

The second strategy SCC could implement in order to avoid under-placement is to allow students to preview the mathematics content they will be learning within their course placement by auditing the class during the first week of the semester without officially registering. Harvard University is known for allowing an early “shopping week” which encourages students to audit a class(es) during the first week of the semester instead of setting a fixed schedule of courses prior to the start of the term (Koller & Peterman, 2021). Replicating this model can allow students placed into developmental education to audit the class they were sorted into as a result of A & P and determine whether it would be a review of high school content or an appropriate academic challenge. Within the same week, students may also audit the next class in the mathematics sequence. By auditing both mathematics classes students would have the opportunity to eliminate a semester in lower level course placement. Additionally, students would get a feel for the instructor and format of the mathematics class. Importantly, students would have the power to take a different course than the one they were assigned based on A & P outcomes without requiring approval from an instructor or counselor. Through audit week, students would in effect

be allowed to re-assess their own mathematics skill set, decide on their final course placement, and enroll in the course that is right for them.

A third means of determining whether a student's course placement matches their perceived breadth of knowledge would be to administer a survey during the first week of classes. Students who found their course placement unchallenging would be automatically exempt and moved to the next course in the sequence without requiring a visit to an advisor or institutional approval. These three strategies would allow SCC to consistently support students' access to the highest course placement possible and avoid course under-placement. Moreover, students would be empowered to ask questions about A & P, to think of course placement outcomes as easily mutable, and to see themselves as having the power to decide on an appropriate mathematics course to enroll in.

Further, the implementation of state-mandated MM is not a panacea for A & P. About two and a half years have passed since the implementation of AB 705 in the fall of 2019. MM is now the primary means of evaluating students' English and mathematics skills and sorting them into coursework using at least one: high school coursework, grades, or grade point average (California Legislature, 2017; CCCCO, 2018). One of the earliest studies of the changes to A & P based on AB 705 by the Public Policy Institute of California found an increase in student's access to transfer-level courses and course completion (Cuellar Mejia et al., 2020). In the fall of 2015, 78% of first-time mathematics students gained access to transfer-level classes as compared to only 21% in the fall of 2019 (Cuellar Mejia et al., 2020). Access to transfer-level mathematics coursework more than doubled due to AB 705's MM policies. Transfer-level mathematics course completion also doubled by the fall of 2019 (Cuellar Mejia et al., 2020). Students were 30% more likely to complete a transfer-level course with corequisite instruction within one semester

than traditional models in an entire year (Cuellar Mejia et al., 2020). This research suggested that AB 705 MM policies were successfully providing students with access to and completion in transfer-level mathematics courses without the need for developmental education, however, disparities among race and ethnicity continued (Cuellar Mejia et al., 2020).

In October of 2021, two years after AB 705's implementation, the California Acceleration Project published a report that also found "unprecedented gains in student completion," (p. 5) but shed light on CCC's practice of preserving developmental education. In this study, 60% of students who started in transfer-level mathematics completed the course while only 14% of those who enrolled directly into developmental education did so (California Acceleration Project, 2021). As previously discussed, AB 705's goal was to eliminate any use of developmental education enrollment unless CCCs could show that students were "highly unlikely" to pass a transfer-level coursework in mathematics (California Acceleration Project, 2021; California Legislature, 2017). This study found that CCCs continued to place students into mathematics developmental education despite all 114 A & P validation reports indicating that none "could reliably justify placing students into remedial math" (California Acceleration Project, 2021, p. 2) in light of AB 705 standards. In essence, CCCs could not prove that students would fail transfer-level mathematics courses, yet, continued deny them the opportunity to succeed by sorting them into developmental education. Similar to SCC's practice, the study found that CCCs ignored high school grades and "inappropriately" directed students into mathematics developmental education (California Acceleration Project, 2021, p. 4).

Further, under AB 705 Latinx students continued to be disproportionately impacted by local A & P policies that sorted them into developmental education though they could have been successful in transfer-level courses (California Acceleration Project, 2021). Research suggests

that CCCs must faithfully implement AB 705 and eliminate developmental education mathematics courses that serve to disproportionately impact Students of Color, Latinx in particular (California Acceleration Project, 2021; Cuellar Mejia et al., 2020). Community colleges in California and in other states must be vigilant in order to avoid perpetuating the disenfranchisement of first-generation college students, especially Latinx, due to A & P practices that have a negative disproportionate impact. Community college students' voices will continue to be critical in highlighting the need for institutions to guide them through A & P in a way that fosters their successful transition into higher education, transfer, and degree completion.

Implications for Policy

CCCs and other States, can use this dissertation's findings to inform changes to existing A & P policies, standardized placement testing and/or MM, that are equitable for all students. Community colleges, K-12, and the State must continue working together to define college readiness and transfer-readiness policies that align and extend along the P-16 education pipeline (Bailey et al., 2015; Collins, 2008). One way CCCs may promote students' academic success is by providing an early assessment of students' needs, for instance, through the Early Assessment Program (Howell et al., 2010). Efforts can be made to finally align K-12 college readiness standards to community college A & P and curriculum (Castro, 2013; Collins, 2008). Additionally, CCCs can robustly communicate A & P policies to entering students (Park et al., 2013; Safran & Visher, 2010; Venezia et al., 2010).

CCCs can use this dissertation study's findings to shape A & P policies that provide students a holistic assessment of mathematics skills and consistently transparent information about its consequences and impact on educational planning and transfer outcomes. Uniform A & P policies in California, and in other States, that clearly outline community colleges

responsibilities may serve to reduce or eliminate biases in A & P by individuals as well as structural inequity for under-served groups. This dissertation study's findings may empower campus stakeholders as well as students to better understand what MM policies mean for long-term course taking patterns as well as transfer success. This dissertation study can provide a starting point for community colleges around the country to examine the consistency of their own A & P policies and practices with the goal of removing structural barriers and disenfranchisement. States that enroll Latinx students may use this dissertation study's findings in order to inform changes to placement testing or shaping MM policies in order to eliminate structural inequity.

Implications for Future Research

Future research can continue to examine the dearth of knowledge regarding the experiences of Latinx students as they undergo A & P at community college. In particular, researchers may focus on Latinx student experiences with MM policies and practices in California and across the U.S. as they unfold. A close examination of the ways in which community college personnel apply MM policies would be beneficial. Also, future research can examine MM for A & P's impact on existing disparities in developmental education enrollment, course completion, and transfer rates by race/ethnicity. Further, researchers might examine the ways in which community college personnel understand each other's roles, communication, and support when it comes to A & P. Moreover, research will be needed to scrutinize the validity of MM for A & P as more data is available. Finally, future research is needed to examine the ways in which any forms of bias, disenfranchisement, and/or violation of civil rights might be present in the MM approach to A & P.

Final Conclusions

SCC may have been in violation of the Student Success Act of 2012. A & P in the form of a standardized test and subsequent course placement perpetuated structural inequalities and disenfranchised Latinx students in this dissertation study. At SCC, A & P outcomes were legitimized while student's experiences were invalidated. Entering students in this study with transfer aspirations were provided with scarce information about the placement test's purpose and consequences, including developmental education enrollment and were barred from selecting transfer-level coursework. Students in this dissertation study as well as the millions enrolling at community colleges across the country that are aspiring to greatness must be provided equitable resources starting at the point of matriculation, in particular A & P, so their dreams may be achieved.

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Appendix A

Student Contact Information Sheet

First Name: _____ Last Name: _____

Date: _____ Phone: _____ Email: _____

Community College: _____ Age: _____ Gender: _____

=====

Instructions: Select the box that best applies. Select "N/A" if not applicable.

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. Is this the first community college you have ever enrolled in? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Have you ever enrolled at another community college? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Are you a first-generation college student? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Do you identify as a Latina, Latino, or Latinx student? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. When first enrolling at community college, was your goal to transfer to a four-year university? | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Are you a full-time community college student? | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Are you a student parent? | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Are you currently employed? | <input type="checkbox"/> | <input type="checkbox"/> |

Instructions: Answer the question by filling in the blank. Write "N/A" if not applicable.

9. What year did you earn a high school diploma? _____

10. When did you first enroll at this community college? Semester: _____ Year: _____

11. When do you plan to apply for transfer to a four-year university? Semester: _____ Year: _____

12. When do you plan to enroll at a four-year university? Semester: _____ Year: _____
13. What is your major/program? _____
14. What was the first math/English class you enrolled in? _____
15. What math/English class are you currently enrolled in? _____
16. How many math/English classes have you taken? _____
17. How many math/English classes do you have left to take in order to meet transfer requirements? _____
18. When will you take the last math/English class required for transfer to a four-year university?
Semester: _____ Year: _____

Thank you for your interest in participating in this study! I will follow up with you shortly.

Appendix B

Recruitment Statement

Hi! My name is Elizabeth Flores, I am a community college alumni and a Ph.D. student in the School of Education at the University of California at Davis. I want to ask you to volunteer for an hour-long interview for my dissertation study. The interview will be on campus for your convenience.

So, what is the study about? It's about your experience as a community college student.

And why is this study important? Student experience matters, yet, often student voices go unheard. Having your voice represented may help community colleges better serve students.

So, what does participating look like? Study volunteers will be interviewed about their student experience. The on-campus interview will be audio recorded and last about one hour.

Volunteering in no way influences your grade in this class. Also, the information you provide will be kept confidential. Only my dissertation advisor and myself will have access to the interview data. And as a token of appreciation, participants will receive a \$25 gift card.

I welcome everyone interested in participating to take the next few minutes to fill out a contact information sheet. I will collect them and reach out to you to schedule an interview.

Thank you for your time. I am grateful for your support.

Appendix C

Student Study Consent Form

Title of research study: Student Experience with Matriculation at Community College

Investigator: Elizabeth Flores, Patricia D. Quijada

Why am I being invited to take part in a research study?

We invite you to take part in a research study to help us better understand the experiences of students who start at community college. To participate in this study, you must be over the age of 18, have enrolled in community college within the last two years. Your participation is completely voluntary.

What should I know about a research study?

Your participation in this research study is completely voluntary. The responses you give to interview questions will not be shared with persons outside this research project. Your responses will be reviewed, along with other participants' responses, as the researcher looks for patterns in the experiences of undergraduate students who start their careers in community college. Your individual responses may be included in research findings, but your identity will never be disclosed. Your name and personal information will not be shared with anyone outside the research team.

This research has been reviewed and approved by the UC Davis Institutional Review Board (IRB). Information to help you understand research is on-line at <http://www.research.ucdavis.edu/policiescompliance/irb-admin/>.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team:

Elizabeth Flores, PhD Candidate

Patricia D. Quijada, Professor

laflores@ucdavis.edu

pdquijada@ucdavis.edu

School of Education

School of Education

University of California, Davis

University of California, Davis

One Shields Avenue

One Shields Avenue

Davis, CA 95616

Davis, CA 95616

You may talk to a IRB staff member at (916) 703-9151, hs-irbadmin@ucdavis.edu, or 2921 Stockton Blvd, Suite 1400, Room 1429, Sacramento, CA 95817 for any of the following:

Your questions, concerns, or complaints are not being answered by the research team.

You cannot reach the research team.

You want to talk to someone besides the research team.

You have questions about your rights as a research subject.

You want to get information or provide input about this research.

Why is this research being done?

The CCC system is the largest in the U.S. with 114 colleges and 2.1 million students. Though enrollment is high there is a need to find out about the experiences of students as they matriculate in community college. Researchers have debated the ways in which matriculation processes influence student academic goals. This study is being done to better understand what the

experiences are for those who start at community college and go on to enroll in math and/or English coursework.

How long will the research last?

This research study will take place approximately from April of 2018 until summer 2022. I will conduct interviews from about April through summer 2022. I will complete final analysis by summer 2022 and write-up results by summer 2022. However, your commitment to this study will be a one-time interview.

How many people will be studied?

This study will include approximately 18 people.

What happens if I say yes, I want to be in this research?

If you agree to be in this study, you will be asked to participate in a total of 1 interview by summer 2022. The interview will take place no later than summer 2022. The interview will take approximately 60 minutes and will include questions about your decision to enroll at this campus, what your enrollment process was like, and what your classes are like. With your permission, the interviews will be audio-recorded so that I can review, transcribe, and code them later.

A short follow-up interview may be requested for participants to clarify preliminary findings. Participation in a follow-up interview or receiving information about our results is completely voluntary.

Additionally, I will access student records related to matriculation. For example, the first time students enrolled at community college and the measures used to sort students into math and/or English coursework.

What happens if I do not want to be in this research?

You may decide not to take part in the research and it will not be held against you.

What happens if I say yes, but I change my mind later?

You can leave the research at any time and it will not be held against you.

What happens to the information collected for the research?

The responses you give to our interview and your personal information will only be shared with the researchers. However, I cannot promise complete confidentiality. Organizations that may inspect and copy your information include the IRB and other University of California representatives responsible for the management or oversight of this study. Data will be banked for future use. Additionally, identifying information will be collected but not reported on.

Subjects' confidentiality will be maintained using pseudonyms.

What else do I need to know?

If you agree to take part in this research study, at the end of the interview we will provide you a \$25 Starbucks gift card as a thank you for your time and effort.

Do you consent to participating in the research study?

_____ No, I do not agree to take part in this research study.

_____ Yes, I agree to take part in this research study.

_____ Date: _____

(Participant – Print Name)

(Participant – Signature)

_____ Date: _____

(Researcher/Person Obtaining Consent -

(Researcher/Person Obtaining Consent -

Print Name)

Signature)

Appendix D

Student Interview Questionnaire

WARM UP

- 1) I would like to learn a little about you. Tell me a little bit about yourself.
- 2) How do you prefer to be referred to as Latina, Latino, Latinx, or something else?
- 3) High school can be experienced in many ways. How was high school for you? Tell me a little about this time.
- 4) What did you know about community college in high school? Tell me more.
- 5) Why did you decide to enroll in community college? Tell me more.

LATINA/O/X EXPERIENCE

- 6) I want to know about your experience as a community college student. Can you take me back to what was going on with your life when you first enrolled at community college? Tell me about that time.
- 7) I want to talk a little bit about you as a Latina/o/x student. Tell me about the first time that you recognized that you were a Latina/o/x in school. When did you become aware of your racial identity? Tell me about that time.
- 8) Tell me about a time when you witnessed, directly or indirectly, an inequity towards Latina/o/x students.
- 9) I want to talk a little bit about you as a Latina/o/x student. Tell me about the first time that you recognized that you were Latina/o/x in school. Tell me about that time.
- 10) Tell me about a time you experienced inequity in school. Tell me more.
- 11) How has that impacted who you are? Tell me about that time.
- 12) Tell me about a time you experienced racism in school.

DEVELOPMENTAL EDUCATION & TRANSFER

- 13) Can you tell me the overall steps you took to go from applying to community college to starting your first math/English class?
- 14) **[Show student the list of enrollment steps]**. How do the steps you just described compare to the enrollment steps listed in the enrollment steps list provided by the community college? Tell me more.
- 15) **[Show student the math/English developmental education course sequence diagram]**. Take a look at this diagram. What does this diagram represent to you? Tell me more.
- 16) Now, notice where the first math/English class you took is at on the diagram. What does it mean for your first math/English class to be in this place in the diagram? Tell me more.
- 17) What does it mean for your first math/English class to be in this place in the diagram when it comes to transfer? Tell me more.
- 18) How would you figure out which math/English classes meet transfer requirements, if you did not have access to the diagram? Tell me more.
- 19) How did you feel about having to take your first math/English class? Tell me more.
- 20) What does being in your first math/English class mean for your goal of transferring to a four-year university? Tell me more.
- 21) Have you heard of developmental education/basic skills classes?
- 22) Tell me what you know about developmental education/basic skills classes.
- 23) How have you experienced being a Latina/o/x student in your math/English class? Tell me more.

MULTIPLE MEASURES

- 24) When you first went to enroll at community college, besides basic information, what

documents did you need to provide? Please elaborate more.

25) Did you provide any academic information from high school when first enrolling at community college? Tell me more.

26) What did you need to do to enroll in your first math/English class? Tell me more.

27) Did anyone help you during the process of enrolling in your first math/English class? Tell me more.

28) I wonder, how prepared did you feel to during the process of enrolling in your first math/English class? Tell me more.

29) Did your high school history get considered during the process of enrolling in your first math/English class?

30) As a Latina/o/x, how have you experienced the process of enrolling in your first math/English class at community college?

31) Now that you are enrolled in a math/English class, do you know of other student's who have used different strategies to get access to higher-level math/English classes? Tell me more.

ASSESSMENT AND PLACEMENT/TESTING

Before enrolling:

32) **[SKIP PATTERN QUESTION: The introduction for the next question depends on whether the student has talked about the test when answering this question: What did you need to do to enroll in your first math/English class?]**

a. If no test mentioned ask: Before enrolling in your first math/English course, do you remember taking any tests? Tell me more.

b. If test is mentioned say: Let's talk a little bit more about the test you mentioned earlier.

- 33) How did you find out about the test? Tell me more.
- 34) What did you think the purpose of the test was at the time? Tell me more.
- 35) What is typically done with test results? Tell me more.
- 36) [**Show campus map**]. Take a moment to look at this campus map. I want you to remember then identify the places where you received information about the test. Can you point out the places where did you find out information about the test? Tell me about that time.
- 37) Who are the key people who provided you with details about the test?
- 38) What exactly did they tell you about the test? Tell me about that time.

On test day:

- 39) I want you to remember your test day. Describe to me the hour before the test.

Before testing:

- 40) How were you feeling before taking the test? Tell me about that time.
- 41) Before testing, how did the test compare to exams you took in high school?
- 42) Did you prepare for the test? Tell me more.

After the test:

- 43) Now, let's check in about what happened after the test. How did you feel after the test? Tell me about that time.
- 44) After having taken the test, how did the test compare to exams you took in high school?
- 45) How did you find out about your test results? Tell me about that time.
- 46) What did you do with the test results? Tell me about that time.
- 47) Were you provided with the same information as other students? Tell me about that time.
- 48) Did you retake the test? Tell me more.
- 49) How did the testing experience shape your transfer plan? Tell me more.

50) Did the test change your academic timeline for transferring to a four-year university in any way? Tell me more.

51) How do other students describe their experiences with the test taking process? Tell me about that.

52) Now that you have the benefit of being able to look back on your experience with the test, is there anything you would have done differently when it comes to the test? Tell me more.

CLOSING

53) We're coming up on the last five questions. Looking back, if you could make one change to the testing process, what would that change be? Tell me more.

54) Is there anything the community college can do to prepare students for the process of enrolling in the first math/English class?

55) Is there anything else you think I should know about your experience as a community college student?

56) This is my last question. Is it ok for me to follow up with you if there are any questions that come up after today?

Thank you so much for sharing your experience and participating in my study. I learned a lot from you. Thank you again.