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Studies in Degree Attainment, Student Adjustment and Satisfaction in Higher Education

by

Arlyn Yire Moreno Luna

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

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in the

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of the

University of California, Berkeley

Committee in charge:

Associate Professor Tolani Britton, Chair

Professor Sophia Rabe-Hesketh

Associate Professor Cati V. de los Ríos

Spring 2024

Studies in Degree Attainment, Student Adjustment and Satisfaction in Higher Education

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Abstract

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Doctor of Philosophy in Education

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Associate Professor Tolani Britton, Chair

Higher education provides an avenue for social upward mobility for low-income, first-generation, and historically underrepresented students (Teranishi et al., 2011). In the United States (U.S.), two-year and four-year colleges are part of the postsecondary system. Some high school graduates enroll directly in four-year institutions to pursue a Bachelor's degree. Alternatively, students can start at a two-year institution, also known as a community college. Community colleges serve numerous educational and community functions. Two-year institutions offer the chance to obtain an associate degree, acquire a technical degree or certificate, or complete basic course requirements to later transfer to a four-year institution. These institutions are sometimes located where students cannot access four-year institutions. In addition, the massification of higher education in the U.S. can be credited to two-year institutions because of their open access policies to higher education (Zamani-Gallaher, 2016). An analysis conducted by the Community Colleges Research Center estimated that 8.9 million students were enrolled in two-year institutions in the 2020 - 2021 academic year, representing 41% of undergraduates in the U.S. ("Community College FAQs", n.d.). As of 2023, there were 932 public two-year institutions in the U.S.

As a quantitative higher education scholar, examining two-year and four-year institutions is important to understand the relationship between higher education pathways, student experiences, and degree attainment. By exploring degree attainment at two-year institutions, the experiences of students attending four-year institutions, and the transition perceptions of transfer students from two-year colleges to four-year institutions, I can depict a more comprehensive view of students' pathways, experiences, and outcomes in higher education. I began this work by first focusing on the characteristics of two-year institutions associated with degree completion because community colleges provide a point of entry into higher education for historically underrepresented students in higher education. However, this pathway also has drawbacks. For example, in 2010, of students who enrolled in two-year institutions intending to transfer to a four-year institution, only 31.5% successfully transferred by 2016

(Dowd et al., 2020). Next, I delved into students' college adjustment at four-year institutions. Students' college adjustment is associated with student outcomes such as re-enrollment, engagement, and degree attainment. Once students enroll in college, their experiences are shaped by the type of university students attend, the institutional racial climate, their sense of academic belonging, student agency, community, faculty, and advisor support (Brown et al., 2024; Means & Pyne, 2017; Ostrove & Long, 2007; Torres & Hernandez, 2009). Lastly, I examine Latinx¹ college satisfaction for transfer and non-transfer students. I also explore whether there is an association between college satisfaction and college adjustment for Latinx students and whether there are differences in college satisfaction for first-generation Latinx students compared to their non-first-generation peers. Below, I lay out the research question, data source, and contribution to the literature for each of the three studies in this dissertation.

Study 1

In my first paper, I focus on degree attainment at two-year institutions in the U.S. I examined the relationship between associate degree attainment and institutions' characteristics (location and size). This study used a publicly available dataset, the Integrated Postsecondary Education Data System (IPEDS), for 805 two-year institutions in the U.S. from 2000 to 2015. This study uses multilevel and longitudinal modeling, and the study findings included that rural small and medium institutions, on average, had higher associate degree attainment than suburban or urban community colleges.

When examining the effect of institutional quality, higher education research has traditionally focused on four-year institutions (Alon & Tienda, 2005; Long, 2008; M. J. Mayhew, 2016; Melguizo, 2008). This paper contributes to the current literature by focusing on two-year institutions and controlling for institutional quality indicators such as the faculty-student ratio. A second contribution of this paper is the analysis of 14 years of longitudinal data for all U.S. 2-year institutions. Traditionally, degree attainment research at two-year institutions has focused on smaller time frames (Yang & Venezia, 2020). Third, I use two random-intercept models to handle clustered data in the study to correctly estimate p -values and standard errors while controlling for the effect of educational expenditures, faculty-student ratio, and financial aid allocation per student to obtain a more accurate association between the institution's size, location, and degree attainment.

Study 2

From students' first year to graduation, college adjustment changes as they navigate higher education. College adjustment and experiences can be positively or negatively associated with a student's social and academic progress and retention and graduation rates. This study

¹To be inclusive of individuals, I use the term Latinx/a/e/o throughout the dissertation. Occasionally, I use the ethnic labels used by the referenced authors.

focused on developing and validating an instrument that measures student college adjustment using item response theory. Building on previous instruments used to measure college adjustment, this instrument expands the literature by incorporating five adjustment domains: academic belonging, student agency, community, faculty, academic advisor support, and equity (Byrd, 2019; Harbin, 1997; Laanan, 2004). Traditionally, research that examines college adjustment has looked at these domains separately (Jääskelä et al., 2021; Kuh et al., 2006; Tovar et al., 2009). This study elaborates on a pilot study that I conducted in Fall 2021. Data collection for this study was conducted in Spring 2023 using the Undergraduate Student College Transition and Adjustment (USCTA) survey at an elite public four-year institution member of the Association of American Universities. The survey contained 130 questions, including academic and demographic questions, questions used for study two of the dissertation, and only 65 items were used to calibrate the instrument.

I contribute to the literature by examining all academic years and students' adjustment by transfer status. This instrument expands on Tinto (2012) and Berger's (1997) work by including an equity domain and focusing on an elite public institution. Previous work has shown differences in student experiences and outcomes by the type of institutions students attend (Byrd, 2019; Scott et al., 2016). This project advances the literature by developing a new instrument to measure college adjustment at elite public institutions. Findings show that the instrument is valid for measuring students' college adjustment. College adjustment also varies across academic years and by race. When examining college adjustment by race, Asian students had higher levels of college adjustment, followed by their White and Latinx peers.

Study 3

The Latinx population in California continues to grow; over one-quarter of all Latinx living in the U.S. live in California (Reddy & Siqueiros, 2021). However, college enrollment and degree attainment rates by Latinx students do not reflect its population demographics (Reddy & Siqueiros, 2021). To comprehend the Latinx college experience, this study centers on Latinx college satisfaction and adjustment. Previous research has highlighted the relationships between college satisfaction and adjustment on students' re-enrollment, retention, and graduation rates (Duncheon, 2018; J. Llamas et al., 2020; T. Yosso et al., 2010). This study uses the USCTA survey, data collected in Spring 2023 at an elite public institution with 32,831 undergraduate students enrolled in Fall 2022. I first examine if there is a difference in college satisfaction for Latinx students by transfer status. This was followed by studying the association between college adjustment and three components of college satisfaction: academic and community satisfaction, student well-being and resources satisfaction, and ethnoracial diversity satisfaction. Lastly, after aggregating all three components of college satisfaction into one satisfaction score, I examine its association with college adjustment after controlling for students' characteristics such as transfer status, gender, socioeconomic status, and first-generation status.

Results showed that Latinx transfer students do not differ in college satisfaction from their non-transfer Latinx peers. Also, I found a positive association between college adjustment and two components of college satisfaction: academic and community satisfaction, student well-being, and resource satisfaction. Also, after aggregating the three components of college satisfaction, there was a positive association with college adjustment. Lastly, first-generation Latinx students had lower levels of college satisfaction than their non-first-generation Latinx peers. This study contributes to the literature by conceptualizing and operationalizing college satisfaction using a new multidimensional approach incorporating three dimensions of Latinx college satisfaction. In this paper, I use disaggregated data to examine college adjustment and satisfaction for Latinx transfer students compared to their non-transfer Latinx peers at an elite public institution.

In summary, these three studies have highlighted key institutional characteristics such as size and location associated with associate degree attainment. Moreover, they have introduced innovative methodologies for measuring students' college adjustment through a comprehensive approach encompassing five domains and a new method for understanding Latinx college satisfaction within an elite institution. Collectively, these studies contribute to the field of higher education by offering new approaches and methodologies that better capture the diverse array of student experiences, thereby contributing to our understanding of degree attainment, college adjustment, and college satisfaction.

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¡Hay que vivir sembrando! ¡Siempre sembrando!

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Study 1

Analysis of Associate Degree Attainment by Institutional Characteristics for Two-Year U.S. Institutions

1.1 Abstract

Two-year institutions are critical in upward social mobility. Some functions of two-year public colleges are access to higher education, access to technical and vocational careers, local and regional economic development, and access to language acquisition courses. However, it is less clear which characteristics of two-year institutions are related to degree attainment outcomes. This study uses random-intercept models to explore the association between associate degree attainment and two-year institutions' characteristics (location and size) while controlling for other institutional characteristics. I used the Integrated Postsecondary Education Data System (IPEDS) – a nationally representative publicly available longitudinal database – for 805 two-year institutions in the U.S. from 2000 to 2015. Variables for institutional factors include faculty-student ratio, financial aid, and expenditures by category (instructional, academic support, and student services). Results showed that rural small institutions' estimated mean graduation percentage was 6.95 points higher than rural medium institutions. On the other hand, rural large (by 4.06 points), suburban single- (by 4.70 points), suburban multiple- (by 5.47 points), urban single- (by 7.74 points), and urban multiple-campus (by 7.73 points) mean graduation percentages were lower in comparison to rural medium institutions. Findings have implications on the relationship between individual characteristics of rural small and rural medium institutions and the relationship they have with students' degree attainment in comparison to institutions in suburban and urban institutions. *Keywords:* two-year institutions, degree attainment, rural community colleges

1.2 Introduction

Despite persistent social inequalities that disproportionately affect many groups within the United States, education provides a path for upward social mobility (Martinez & Fernández, 2004). But accessing that path is not always easy, with institutional and systemic barriers still existing for too many people (Goldrick-Rab, 2010; Ma & Baum, 2016; Teranishi et al., 2011). Notably, higher education can be a gateway to economic stability for first-generation college students, low-income, and non-traditional students. However, depending on the area where people live, access to higher education institutions or resources is not equal (Baber et al., 2019). Thus, it is essential to examine how the location and size of an institution impact degree attainment as a means to address societal challenges such as social inequality and economic equity.

Community colleges provide a vital pathway to higher education and play an essential role in today's society. The expansion of higher education is credited mainly to two-year institutions (Zamani-Gallaher, 2017). The first two-year institution in the U.S. was established in Illinois in 1901 (Baber et al., 2019). The early proliferation of two-year institutions occurred in California, Florida, Illinois, Michigan, and North Carolina. One-fifth of two-year institutions are estimated to be in California (Baber et al., 2019). California provided a model for strategically placing two-year institutions by considering the location to maximize access to postsecondary education. Therefore, the geographic area is a distinguishing factor for two-year institutions. Generally, two-year institutions provide access to higher education for individuals with limited access to four-year institutions (Baber et al., 2019; Bailey, 2015).

When studying factors that shape students' persistence and degree attainment, traditionally, research has focused on institutional quality as the most effective at promoting educational achievement and which college experiences increase the likelihood of degree completion (Alon & Tienda, 2005; Long, 2008; M. J. Mayhew, 2016; Melguizo, 2008). Institutional quality has traditionally seen selectivity and faculty-student ratio as predictors for greater degree attainment. Alon and Tienda (2005) found that attending a selective institution is associated with a greater likelihood of graduation. Long (2008) also found a positive effect of college quality on degree attainment. However, most higher education research on institutional quality focuses on four-year institutions. Limited longitudinal studies analyze the entire U.S. population of two-year public institutions. In the case of Alon and Tienda (2005), their data consists entirely of selective institutions.

Another body of work explores institutional expenditures and resources, tuition cost, institutional racial and gender characteristics, institutional location, institutional size, and state policies and resource allocation (Bailey et al., 2006; Cragg, 2009; M. J. Mayhew, 2016; Tandberg & Hillman, 2014; Webber, 2012). Furthermore, certain studies explore the achievement of degrees in two-year institutions and examine the relationship between parents' highest level of education and family income as factors in understanding the determinants of associate degree completion (Ma & Baum, 2016). Nonetheless, there are still gaps in the existing body of literature, especially when considering the geographical locations and other predictors of two-year institutions across the United States and incorporating a longitudinal

aspect. A greater understanding of predictors of degree attainment can be incorporated into better policy and institutional design, thereby accelerating upward mobility for future students.

Given the critical role of two-year institutions for higher education access for first-generation, low-income, and minoritized students (Carnevale & Strohl, 2013), I explore the relationship between two-year college location and size and associate degree attainment. This paper contributes to the literature by providing a longitudinal analysis of associate degree attainment for all U.S. two-year institutions by institution characteristics (location and size) for 14 years of clustered data. Ignoring data clustering can lead to incorrectly estimating standard errors and p -values (Rabe-Hesketh & Skrondal, 2012). Therefore, I used a random intercept model to handle clustered data in this study. I calculate the state-specific deviation from the overall mean intercept and the institution's deviation from the state's mean intercept. By adding a second level of clustering by institution, I can consider the institution's deviation within states.

This study makes two contributions to existing literature. First, this study allows us to understand the type of two-year institutions associated with higher associate degree attainment over time. Second, I account for factors that might impact associate degree attainment by controlling for covariates. Specifically, this study examines the effect of the faculty-student ratio on degree attainments at the two-year institution level, where student bodies traditionally are smaller than public four-year institutions.

The research questions are:

1. Is there an association between two-year institutions' characteristics (location and size) and graduation percentage within 150% of the expected timeframe for first-time degree/certificate-seeking students?
2. Is there an association between two-year institutions' characteristics (location and size) and graduation percentage within 150% of the expected timeframe for first-time degree/certificate-seeking students after controlling for faculty-student ratio, educational expenditures (per student), and financial aid (per student)?

In the following section, I provide a brief review of relevant literature. I begin by describing why students enroll in two-year institutions and the overall enrollment patterns and degree attainment at two-year institutions. Next, I lay out the institutional characteristics associated with students' success by institutional location, faculty-student ratio, financial aid, and institutional expenditures. I explain how two-year institutions are classified using the Associate's Colleges categories developed by Katsinas et al. (2010) based on location and size. I then provide an overview of the data and methods used, present the findings obtained from the analysis, and discuss the implications of the results.

1.3 Literature Review

In 2020, 853 public two-year institutions were in the U.S., with 8.9 million students enrolled, representing 41% of undergraduates (“Community College FAQs”, n.d.; Duffin, 2021). Degree attainment patterns for two-year institutions vary across race, socioeconomic status, and foster youth status. In the 2020-2021 academic year, 51% of Latinx undergraduates were enrolled at two-year institutions, 40% of Black undergraduates, and 39% of White undergraduates (“Community College FAQs”, n.d.). Undoubtedly, two-year institutions play a critical role for historically underrepresented students and students who typically would not otherwise have access to higher education (Baber et al., 2019; Fry, 2002; Ma & Baum, 2016; Teranishi et al., 2011). Thus, two-year institutions are critical institutions that promote social mobility across the U.S. However, changes in associate degree attainment across locations and institutions of different sizes need further examination. Practically, we can thoroughly examine the specific characteristics of an institution that achieves higher degree attainment rates and apply those insights to institutions with lower rates, aiming to enhance their degree attainment outcomes. At the policy level, we can provide valuable information to policymakers, enabling them to implement new policies at the institutional level that would benefit students.

Reasons Students Enroll in Two-Year Institutions

Almost half of all two-year institution students are from racial and ethnic minority groups, and about one-third are first-generation college students (Ginder et al., 2017). Some reasons why students start at a two-year institution are the location of the institutions, affordability, and the fact that courses are often transferable to public four-year institutions (Bailey, 2015; Baum et al., 2018). First, some two-year institutions are in locations where four-year institutions are typically not available. Second, two-year institutions are more affordable than four-year institutions. Baum et al. (2018) reported that in the 2017-2018 academic year, the average tuition for public four-year institutions was \$9,970 for in-state students, compared with \$3,570 for two-year institutions. Third, many students who attend two-year institutions intend to transfer to four-year institutions. It is estimated that 25% of students transfer to a four-year institution within five years (Jenkins & Fink, 2015). While this paper focuses on associate degree attainment by institutional type, findings have implications for the higher education pathway of students who begin at a two-year institution, receive an associate degree attainment, and later transfer to four-year institutions (noted in the conclusion section of this paper).

Two-Year Institutions Patterns

Enrollment

Enrollment patterns in two-year institutions vary across time and by race, socioeconomic status, first-generation students, and foster youth status. All higher education institutions, including two-year institutions, have seen a decline in enrollment rates since 2011 (Baum et al., 2018). Enrollment decline is partially due to increased tuition costs and lower financial aid support. In addition, enrollment patterns vary across states in the U.S. (Ma & Baum, 2016). For the 2019-2020 academic year, 7.7 million students enrolled in public two-year colleges, about 35% of undergraduate students in the U.S. (Hussar et al., 2020).

Overall, first-generation, low-income, non-traditional students (25 years or older) and minoritized students are highly represented at two-year institutions (Carnevale & Strohl, 2013; Ginder et al., 2017; NCES, 2012; Scott et al., 2016). Specifically, Latinx students make up a more significant portion (42%) of two-year institution students than their White peers (24%) (Fry, 2002; Ma & Baum, 2016). Moreover, a longitudinal study found that foster youth (69%) are more likely to enroll in two-year/vocational institutions at age 21 than low-income first-generation students (Okpych & Courtney, 2021). Using the Integrated Postsecondary Education Data System (IPEDS) data, Ma and Baum (2018) showed that in 2014, across all higher education enrollments, Black students represented 44%, Latinx students represented 56%, and White students represented 39% of college students enrolled in two-year institutions.

Associate Degree Attainment

Associate degree attainment also varies across time, and distinct patterns in who earns an associate degree are worth noting. Associate degree attainment within two or three years is relatively low. It is estimated that almost 25% of full-time students seeking an associate degree graduate within three years, and about 10% complete their associate degree in two years (America, 2012). Associate degree attainment also varies by students' gender, race, and socioeconomic status. In 2019, among associate degree earners, 56% were women, and 44% were men. According to Hanson (2021), Latinx/Hispanic, Black, and White individuals had different proportions of adults aged 25 and above with an associate degree or higher in the same year. Specifically, the percentages were 31% for Latinx/Hispanic individuals, 40% for Black individuals, and 56% for White individuals. Bailey (2015) describes that less than 40% of students from working-class families who attend two-year institutions graduate within six years.

Institutional Characteristics and Associate Degree Attainment

Institutional characteristics and quality are essential in students' educational experiences, retention, and degree attainment. Indeed, college quality is complex, with multiple factors that impact students' degree attainment. For this paper, I am interested in examining four

components of institutional characteristics: (1) institutional location, (2) faculty-student ratio, (3) financial aid allocation, and (4) instructional expenditures. I primarily focus on these four categories because these characteristics are interconnected and work simultaneously. By incorporating the four components of institutional factors in the same random intercept model, we can examine their association with associate degree attainment. I am, ultimately, observing which element has been more crucial in associate degree attainment in 14 years. In the next section, I elaborate on each institutional characteristic and discuss previous research on the association with degree attainment.

Institutional Location

The first institutional characteristic I focus on is the location of two-year institutions (rural, suburban, and urban) because institutions differ in enrollment rates by race and budget. Between 2000 and 2001, roughly 3,213,977 (34%) students attended two-year rural institutions, 3,027,986 (32%) students attended two-year suburban institutions, and 3,181,009 (34%) students attended two-year urban institutions (Hardy, 2005). First, although student enrollments across institutional locations are evenly distributed, students' enrollment rates by race and ethnicity are significantly different by institutional location. Notably, rural two-year institutions differ significantly from suburban and urban institutions. According to a study by Hardy and Katsinas (2007), African American students constitute the largest minority group in rural public two-year institutions and technical colleges, accounting for nine percent of student enrollment. Latinx students make up seven percent, American Indian and Alaska Native students make up one percent, Asian and Pacific Islander students make up two percent, and White students make up 74%. For suburban and urban public two-year institutions, Latinx students constitute the largest minority group, representing 15% and 21% of the student population, respectively. American Indian and Alaska Native students account for one percent in both settings, while Asian and Pacific Islander students make up 11% and nine percent, African American students make up nine percent and 16%, and White students make up 54% and 45% of the student enrollment in these institutions. Second, another difference worth noting is budgets. Overall, rural two-year institutions have a smaller budget. The average annual budget for the 2001 fiscal year was \$23.4 million for rural two-year institutions compared with \$50.2 million for suburban and \$102.4 million for urban two-year institutions (Roessler, 2006).

Dache-Gerbino (2017) employed a geographic information system to collect and analyze data from the U.S. Census and IPEDS in the City of Rochester, New York, finding that four-year institutions are clustered near higher-income, white populations than Black and Latinx populations. Limited research focuses on the location of two-year institutions when looking at associate degree attainment. While some research includes the two-year institution's location, traditionally, it is included as a control variable and not as the primary independent variable to examine the entire association on degree attainment (Calcagno et al., 2008). This study contributes to the literature by investigating location as a primary independent factor in degree attainment for a more extended period.

Faculty

The second institutional characteristic I focus on is faculty, particularly the faculty-student ratio. Faculty are critical in students' success, academic trajectories, and career outcomes. Pascarella and Terenzini (1976) found that positive formal or informal faculty-student interaction helps students develop a more substantial positive perception of their academic goals and intellectual development. Similarly, a study by Long (2008) found that a one standard deviation improvement in the student-faculty ratio was associated with a six to nine percentage point increase in graduation. For Asian/Pacific Islander, Latinx, and Native American students, relationships with instructors substantially affect student learning more than students' background characteristics (Lundberg & Schreiner, 2004).

Moreover, Tovar (2015) examined interactions with institutional agents (faculty and academic counselors) on GPA influence and intentions to persist in degree completion for Latinx students in two-year institutions. Results showed that faculty play an essential role in students' persistence – when faculty pay attention to students, this results in higher retention rates. Regarding transfer success, Cuseo (1998) conducted a literature review and found that faculty involvement at two- and four-year institutions is one of the higher institutional factors associated with transfer success. In contrast, past research focused on the positive impact of faculty-student interaction; in this project, I controlled for the faculty-student ratio to accurately calculate the association between two-year institutions' location while controlling for the student-faculty ratio.

The number of students compared to the number of full-time professors determines the faculty-student ratio. Research has shown that a higher faculty-student ratio means larger classes, weaker interactions between faculty and students, and decreased teaching quality (Card & Krueger, 1992). On the other hand, smaller classes can translate to more interactions between students and faculty. Research by Pascarella and Terenzini (1978) showed that when students have more frequent interactions with faculty, they tend to perform better academically than predicted by pre-enrollment characteristics. Students with little informal faculty interaction tended to perform at lower levels than anticipated. In this paper, I contribute to the literature by exploring the association between associate degree attainment and faculty-student ratio by institutional type and how it has changed over 14 years.

Financial Aid

A third factor that is paramount to student success is financial aid, primarily because it allows students to attend college who otherwise would not be able to participate in college. In the past three decades, tuition prices have risen rapidly, while financial support for students has declined (Desrochers & Hurlburt, 2016). As described previously, students' characteristics at two-year institutions include low-income, non-traditional (age 25+) students who are parents, first-generation, and historically minoritized students (Ma & Baum, 2016). These student populations typically rely heavily on financial aid to pay for college. If students cannot access financial assistance, they cannot pay for college and, subsequently, cannot

attend. In general, when institutions receive more financial aid, they can provide a more robust education for their students. This paper examines financial aid's association with degree attainment at two-year institutions.

Expenditures

The last institutional characteristic that I focus on is institutional expenditures. IPEDS uses a functional expense classification, a method that groups institutional expenses (NCES, 2012). Overall, eleven categories under institutional expenses are defined by IPEDS, each contributing to students' success at different levels. Powell et al. (2012) argues that institutions can be effective and efficient by focusing on three expenditure categories: instructional, academic support, and student services. In addition to Powell et al. (2012), in the next section, I elaborate on why I focus on instructional, academic support, and student services expense categories, as they might be necessary for associate degree attainment.

First, the instructional expenditure category is important for students' associate degree attainment. Tinto's (2012) interactionist theory of college student departure suggests that if institutions allocate increasing resources to instruction and academic support, they ultimately support students' academic ability to relate to their institution. Using Tinto's theory, we can understand the importance of instructional expenditures on students' academic ability to integrate into two-year institutions (Tinto, 2012). Overall, within two-year institution expenses, the instructional expense category includes all activities considered part of an institution's instructional program. In 2013, public two-year institutions, on average, spent \$5,402 on instruction per Full Time Equivalent student (FTE) (Desrochers & Hurlburt, 2016).

Second, the academic support expense category includes all expenses incurred to provide support services for the institution's primary missions: instruction, research, and public services. In 2013, two-year institutions spent the least on academic support (\$1,052 per FTE), as defined by Desrochers and Hurlburt (2016), in comparison to the four-year public (\$1,638 per FTE) and private (\$2,217 per FTE) institutions. Traditionally, research has explored academic support expense allocation and its relationship with students' success. Ryan (2004), using IPEDS, found that instructional and academic support expenditures positively affect cohort graduation rates. Overall, academic and instructional support expenses work together to improve students' learning environment and potentially increase the likelihood of students' retention and graduation.

Third, student services enhance the college experience for students. The student services expense category includes all expenses incurred from admissions offices to cultural and social development outside of the formal instruction programs. In 2013, public two-year institutions, on average, spent \$1,360 on student services per FTE student (Desrochers & Hurlburt, 2016). Student services are vital in compensating for the many barriers that students face (Astin et al., 1996). For students with intersectional identities who face multiple barriers, student services (e.g., career counseling, mentoring programs, etc.) can support students to

fully overcome those intersectional barriers as they navigate and persist in higher education (Ryan, 2004; Tinto & Engle, 2008).

Previous research shows that institutional characteristics (e.g., two-year institution location, faculty-student ratio, financial aid, academic expenditures, etc.) influence student persistence and degree attainment. However, previous research has yet to address how these components are related while controlling for certain variables clustering observation per institution within a state and using national longitudinal data representing all U.S. two-year institutions.

Two-Year Institutions Classification

This paper uses institutional-level data from the Integrated Postsecondary Education Data System (IPEDS), which includes aggregated student characteristics, enrollment, faculty, finances, and degree attainment. I examine the relationship between two-year institutions' location and size characteristics and degree attainment while controlling for other variables. IPEDS defines location and size characteristics. First, they are characterized by the college's location in rural, suburban, and urban areas. Second, colleges in rural areas are characterized by small, medium, and large size. In contrast, colleges in suburban and urban areas are characterized by single and multiple campuses (Figure 1.1).

Urban and suburban institutions are located within primary metropolitan statistical areas (PMSAs) or metropolitan statistical areas (MSAs), respectively, with a population exceeding 500,000 people, according to the 2000 census. Those institutions in PMSAs or MSAs with a lower total population or not in PMSA or MSA were classified as rural institutions. Rural institutions are categorized into three types by size (using IPEDS data for 2008-09) based on full-year unduplicated credit headcount: small is defined as less than 2,500, medium as 2,500 to 7,500, and large as greater than 7,500.

Suburban and urban institutions are divided into single-campus and multiple-campus. Suburban and urban institutions, classified as single campus have one primary physical campus where all courses required to complete an associate degree are provided. Suburban and urban institutions, classified as multiple campuses, have more than one primary campus or are part of a district or system comprising multiple institutions, at any of which students can complete all requirements for an associate's degree.

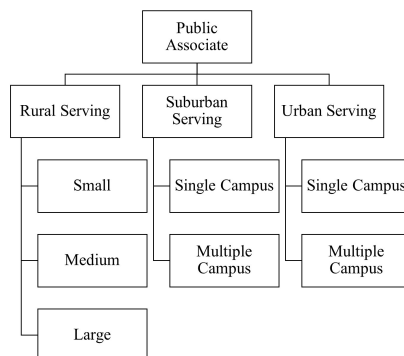


Figure 1.1: Associate Colleges Categories Classification (Katsinas et al., 2010)

1.4 Method

Data

The dataset used for this research was obtained from the Delta Cost Project (DCP), a publicly available longitudinal database derived from the Integrated Postsecondary Education Data System (IPEDS; for more information, please see: <https://nces.ed.gov/ipeds/>). IPEDS contains detailed information regarding finance, enrollment, staffing, completions, and student aid from every postsecondary institution (public, private nonprofit, and private for-profit) in the U.S. that participates in the federal student financial aid programs for academic years 1986-87 through 2014-15.

IPEDS includes database files from 1987 to 1999 and from 2000 to 2015. I used the 2000-2015 data file containing $n = 7,251$ higher education institutions. The first step in defining the targeted population in the data was to keep all public two-year institutions (labeled as sector 4); I dropped all non-two-year institutions $n = 6,314$. The second step of defining the data was using the Carnegie Classification 2015-10, which classifies two-year degree-granting institutions accredited by an agency recognized by the U.S. Secretary of Education. Institutions not classified as degree-granting and accredited were dropped ($n = 1,749$, 11.57%). Lastly, I dropped institutions considered as Special Focus ($n = 119$, 0.79%), private not-for-profit ($n = 10$, 0.07%), public two-year colleges under four-year universities ($n = 420$, 2.78%), and tribal colleges ($n = 266$, 1.76%). After defining the data, the dataset included 12,558 observations of 805 unique two-year institutions across 16 academic years (2000 to 2015). Since the outcome variable of interest (graduation percentage) was missing over 12% of the institutions in the first two years, I deleted 2000 ($n = 797$, 6.35%) and 2001 ($n = 799$, 6.36%) academic years, resulting in a total of 10,962 observations from 2002-03 to 2015-16 academic years for 805 unique two-year institutions.

Measures

The following variables were used:

Outcome Variable:

Graduation Percentage – Continuous percentage of first-time, full-time degree/certificate-seeking undergraduate students graduating within 150 percent of normal time from two-year institutions.

Explanatory Variables:

Associate's College Characteristics – Categorical, indicating the institutional location and size, defined in terms of seven categories: rural small, rural medium, rural large, suburban single-campus, suburban-multiple campus, urban-single campus, and urban multiple-campus. Six dummy variables were constructed for the seven, using the rural medium as the reference group.

Faculty-Student Ratio – Continuous number of full-time faculty members per 100 full-time-equivalent students (FTE). This variable was created by summing all instructional, research, or public service faculty, dividing by the total fall FTE students enrolled, and multiplying by 100.

Aid – Continuous, total student aid per student in 1,000-dollar units. This variable was created using the total student aid for the year divided by the total number of full-time-equivalent students enrolled, divided by 1,000. To interpret the impact better, I changed this variable from dollars to thousands of dollars by dividing the amount of financial aid allocated per student by 1,000.

Expenditure – Continuous, total educational spending for the year per student. This variable was created by summing all educational expenditures (expenditures for instruction, expenditures for academic support, and expenditures for student services) and dividing by the total number of full-time-equivalent students enrolled.

Statistical Analysis

In this study, I analyzed how two-year institutions' characteristics contribute to students' success. Using two random intercept models, I first examine whether or not there is an association between graduation percentage and the two-year institutions' characteristics (Model 1). Second, building on the first model, I control for the faculty-student ratio, educational expenditures (per student), and financial aid (per student) (Model 2). This research uses hierarchical linear modeling (HLM) for a longitudinal dataset with two levels of data nesting, yearly observations within a particular two-year institution and within the state where the institution is located. Using HLM, I can differentiate between state variance in the dependent variable (associate degree attainment) across all two-year institutions and within-state

variance for each institution. This research contributes to the literature by providing a more accurate relationship at each level.

Model 1

For research question one, a random intercept model was used to investigate whether there is an association between the graduation percentage of first-time degree/certificate-seeking students graduating within 150% of normal time for two-year institutions characteristics by location and size (rural small, rural medium, rural large, suburban single campus, suburban multiple campus, urban single campus, and urban multiple campus). I employ equation one below:

$$GraduationPercentage_{ijk} = \beta_0 + \beta_1 CollegeCharacteristics_{ijk} + \zeta_{jk}^{(2)} + \zeta_k^{(3)} + \varepsilon_{ijk}$$

$$\zeta_{jk}^{(2)} \sim N(0, \psi^{(2)})$$

$$\zeta_k^{(3)} \sim N(0, \psi^{(3)})$$

$$\varepsilon_{ijk} \mid \zeta_{jk}^{(2)}, \zeta_k^{(3)} \sim N(0, \theta)$$

The response variable is the graduation percentage in a particular year (i) for a specific two-year institution (j) for a state (k). The model includes a population-average intercept β_0 , six variables for the two-year institutions' characteristics (in a vector), with coefficients in the vector β_1 , $\zeta_k^{(3)}$ is the state-specific deviation from the overall mean intercept, $\zeta_{jk}^{(2)}$ is the institution's deviation from the state's mean intercept. ε_{ijk} is an occasion-, institution-, and state-specific error term. The coefficients in β_1 represent differences in mean graduation rate between two-year institutions' categories, not controlling for other variables.

Model 2

For research question two, model 1 is extended to investigate the association between graduation percentage and two-year institutions' location and size while controlling for the number of full-time faculty, academic expenditure, and financial aid. I employ equation two below:

$$\begin{aligned} Graduation\ Percentage_{ijk} = & \beta_0 + \beta_1 CollegeCharacteristics_{ijk} + \beta_2 Faculty_{ijk} \\ & + \beta_3 Expenditures_{ijk} + \beta_4 Aid_{ijk} + \zeta_{jk}^{(2)} + \zeta_k^{(3)} + \varepsilon_{ijk} \end{aligned}$$

$$\zeta_{jk}^{(2)} \sim N(0, \psi^{(2)})$$

$$\zeta_k^{(3)} \sim N(0, \psi^{(3)})$$

$$\varepsilon_{ijk} \mid \zeta_{jk}^{(2)}, \zeta_k^{(3)} \sim N(0, \theta)$$

In addition to the terms in Model 1, Model 2 also includes the faculty-student ratio per 100 students (with coefficient β_2), educational expenditure per student (with coefficient β_3), and financial aid per student (with coefficient β_4). The coefficients in β_1 address research question 2 and represent the mean differences in graduation percentage between two-year institutions' location and size after controlling for other covariates. For example, the coefficient small-rural will represent the mean difference in graduate percentage between small-rural and medium-rural (control group) after controlling for other covariates. The coefficients (β_2 , β_3 , and β_4) of the covariates represent the mean increases in graduation percentage per unit increase in faculty-student ratio (per 100 students), expenditure (per student), and aid awarded (per student) after controlling for other covariates.

1.5 Results

The mean number of observations per institution across the 14 years is 13.5 (ranging from 3 to 14). When examining missing data per variable, four out of five variables had missing data (Table 1.1). Given the sample size, the only potential concern is the missing observations for the faculty-student ratio variable. The percentage missing for graduation percentage, aid, and expenditure is relatively small.

Variable	n	Percentage
Graduation Percentage	84	0.77
Aid	31	0.28
Expenditure	58	0.53
Faculty-Student Ratio	1,509	13.84

Table 1.1: Missing Data Per Variable for all Observations

Descriptive Analyses

There are 48 states in the sample (see Appendix, Table A7); Hawaii and Vermont are not in the sample. The state of California has the most observations ($n = 1,050$, 9.63%), followed by North Carolina ($n = 812$, 7.45%) and Texas ($n = 742$, 6.80%). On the other hand, Kentucky and Rhode Island have the fewest observations ($n = 14$, 0.13%; each) because Kentucky and Rhode Island have only one public two-year institution. Looking at Table 1.2, we can see the distribution of Carnegie 2005 – Associate's Colleges Categories. Overall, the rural medium institutions are the most highly represented in the sample ($n = 3,749$, 34.38%), followed by rural large ($n = 1,727$, 15.84%), suburban single-campus ($n = 1,451$, 13.30%), rural small ($n = 1,260$, 11.55%), urban multiple-campus ($n = 1,198$, 10.98%), suburban multiple-campus ($n = 1,118$, 10.25%), and urban single-campus ($n = 403$, 3.70%).

In Table 1.2, the outcome variable, graduation percentage within 150 percent of the standard time, had a mean of 23.95 and a standard deviation of 12.90 (ranging from 0.46 to 100). Aid awarded per student has a mean of 2.52 units (\$2,520) and a standard deviation of 1.27 (ranging from 0.0018 to 12.94). Faculty per 100 students had a mean of 3.43 and a standard deviation of 1.55 (ranging from 0.19 to 34.45).

Variable	Frequency	Percent	Std. Dev.	Min	Max
Graduation Percentage	10,822	23.95	12.90	0.46	100
Aid	10,875	2.52	1.27	0.0018	12.94
Faculty-Student Ratio	9,397	3.43	1.55	0.19	34.45
Rural Small	1,260	11.55			
Rural Medium	3,749	34.38			
Rural Large	1,727	15.84			
Suburban Single Campus	1,451	13.30			
Suburban Multiple Campus	1,118	10.25			
Urban Single Campus	403	3.70			
Urban Multiple Campus	1,198	10.98			

Table 1.2: Summary of Carnegie Classification and Continuous Variables

Table 1.3 represents a more detailed summary of continuous variables by Carnegie classification (location and size). For the outcome variable, graduation percentage within 150 percent of standard time for rural institutions, the rural small institutions had the highest mean of 33.20 and a standard deviation of 18.98 (ranging from 1.83 to 100). In contrast, the rural large institutions had the lowest mean of 23.34 and a standard deviation of 10.35 (ranging from .59 to 59.24). Suburban and urban institutions with multiple campuses had the highest mean graduation percentage.

For the variable aid awarded per student (for \$1,000 unit), the rural small two-year institutions had the highest mean of 3.11 (\$3,110) and a standard deviation of 1.38 (ranging from .0035 to 10.67). In contrast, the rural large two-year institutions had the lowest mean of 2.44 (\$2,440) and a standard deviation of 1.17 (ranging from 0.23 to 12.94). For suburban and urban institutions, the single campus had the highest mean amount of aid awarded.

Lastly, the rural small institutions had the highest mean of 5.25 for the faculty-student ratio and a standard deviation of 2.50 (ranging from 1.07 to 21.65). In contrast, the rural large institutions had the lowest mean of 3.14 and a standard deviation of 0.92 (ranging from 1.48 to 9.23). For suburban and urban institutions, the single campus had the highest mean amount of aid awarded.

The graduation percentage (see Appendix, Figure A2) distribution is skewed to the right, with possible outliers closer to 100%. The distribution is skewed to the right, with potential outliers for the faculty-student ratio per 100 students (Appendix, Figure A3). The aid awarded per student by \$1,000 (Appendix, Figure A4) had a distribution that is also skewed

Variable	Classification	Observations	Mean	Std. Dev.	Min	Max
Graduation Percentage						
Rural	Small	1,252	33.20	18.98	1.83	100
	Medium	3,715	25.52	11.94	0.46	96
	Large	1,710	23.34	10.35	.59	59.24
Suburban	Single Campus	1,445	20.90	9.46	2.13	100
	Multiple Campus	1,112	22.67	10.65	3.88	86.60
Urban	Single Campus	401	15.99	7.79	.93	44.78
	Multiple Campus	1,187	17.74	11.42	0.48	74.61
Aid						
Rural	Small	1,251	3.11	1.38	0.0035	10.67
	Medium	3,732	2.72	1.19	0.0018	8.67
	Large	1,725	2.44	1.17	0.23	12.94
Suburban	Single Campus	1,450	2.10	1.22	0.08	8.90
	Multiple Campus	1,118	1.86	1.12	0.21	6.14
Urban	Single Campus	403	2.73	1.20	0.26	5.91
	Multiple Campus	1,196	2.40	1.26	0.02	9.44
Faculty-Student Ratio						
Rural	Small	1,058	5.25	2.50	1.07	21.65
	Medium	3,155	3.82	1.24	1.37	9.52
	Large	1,541	3.14	0.92	1.48	9.23
Suburban	Single Campus	1,280	2.64	0.74	1.12	6.39
	Multiple Campus	989	2.63	1.31	0.59	34.45
Urban	Single Campus	317	2.94	0.85	1.19	5.88
	Multiple Campus	1,057	2.73	0.95	0.19	8.14

Table 1.3: Detailed summary of continuous variables by Carnegie classification

to the right with possible outliers closer to 15 thousand. The distribution looks normally distributed for expenditure per student (Appendix, Figure A5) but with more outliers beyond 40,000. Expenditure (per student) was dichotomized at the 50% percentile (\$7,098.46) (see Appendix; Table A8).

Table 1.4 reports the means and standard deviations of all continuous variables. Three standard deviations are given to check how all continuous variables vary overall, between, and within the institution. For graduation percentage and faculty-student ratio, there is more variability between institutions than within them. On the other hand, for aid awarded, there is more variability within institutions than between institutions; this could be due to changes in funding from year to year by each institution.

Variable	Level	Mean	Std. Dev.
Graduation Percentage	Overall	23.94	12.90
	Between		11.39
	Within		6.19
Faculty-Student Ratio	Overall	3.43	1.55
	Between		1.47
	Within		.66
Aid	Overall	2.52	1.26
	Between		.88
	Within		.91

Table 1.4: Means and Standard Deviations Within and Between Clusters

Multilevel Model One

Table 1.5 shows estimates for the first random intercept model (RIM). For rural small institutions, the estimated mean graduation percentage for first-time degree/certificate-seeking students graduating within 150% of standard time from two-year institutions was 7.91 percentage points higher than for rural medium institutions. The estimated mean graduation percentage for rural large institutions is 4.05 points lower than for rural medium institutions but not statistically significant. The estimated mean graduation percentage for suburban single-campus institutions is 4.75 points lower than for rural medium institutions. The estimated mean graduation percentage for suburban multiple-campus institutions is 5.38 points lower than for rural medium institutions. The estimated mean graduation percentage for urban single-campus institutions is 8.08 points lower than for rural medium institutions. The estimated mean graduation percentage for urban multiple-campus institutions is 7.97 points lower than for rural medium institutions.

In the random part of the model, the between-state standard deviation is estimated as 7.94 points. The between-institutions within-states standard deviation is 7.51 points. Overall, the between-states (7.94 points) and between-institutions within-states standard (7.51)

Variable	Coefficient	Robust Standard	z	p	95% Confidence Interval	
<i>Characteristic</i> (Rural Medium Reference)						
Rural Small	7.91	2.22	3.57	< 0.001	3.56	12.26
Rural Large	-4.05	0.92	-4.39	< 0.001	-5.86	-2.25
Suburban Single	-4.75	1.46	-3.25	0.001	-7.61	-1.88
Suburban Multiple	-5.38	1.13	-4.78	< 0.001	-7.59	-3.18
Urban Single	-8.08	1.31	-6.17	< 0.001	-10.65	-5.52
Urban Multiple	-7.97	1.20	-6.64	< 0.001	-10.32	-5.61
Intercept	26.26	1.35	19.50	< 0.001	23.62	28.90
Random State Intercept	7.94	0.94				
Random Institution Intercept	7.51	0.61				
Random Error	6.44	0.36				

Table 1.5: Random Intercept Model One

have a magnitude similar to the degree attainment coefficient for rural small. In addition, the standard deviation between observations, within institutions and states is estimated as 6.44 points. This standard deviation is lower than the between-state and between-institutions within-state standard deviations, which can indicate that year-to-year changes for an institution (after controlling for type) tend to be less substantial than differences between institutions within a state or across states. Lastly, 7.16 is the median absolute difference in the mean associate degree attainment percentages for two randomly chosen institutions that have the same covariate values and are in the same state. It is estimated 7.57 as the median absolute difference in the mean associate degree attainment percentage for two randomly chosen states that have the same covariate values.

Using the estimates for the variance components in the intraclass correlations (ICC) expressions, the estimated intraclass correlation among the latent responses for the same institution:

$$\rho(\text{institution}, \text{state}) = (7.51^2 + 7.94^2) / (7.51^2 + 7.94^2 + 6.44^2) = 0.74$$

and the corresponding estimated intraclass correlation for states is

$$\rho(\text{state}) = (7.94^2) / (7.51^2 + 7.94^2 + 6.44^2) = 0.39$$

The results show that associate degree attainment changes by the institutions students attend and the state of the institution.

Multilevel Model Two

I built on the RIM model 1 by controlling for the faculty-student ratio (per 100 students), aid awarded (per student), and expenditure (per student). Table 1.6 shows the estimates. The estimated mean graduation percentage for rural small institutions is 6.95 points greater than for rural medium institutions, controlling for all other covariates in the model. The estimated mean graduation percentage for rural large institutions is 4.06 points lower than for rural medium institutions, controlling for all other covariates in the model.

The estimated graduation percentage for suburban single-campus institutions is 4.70 percent lower than for rural medium institutions, controlling for all other covariates. The estimated graduation percentage for suburban multiple-campus institutions is 5.47 percent lower than for rural medium institutions, controlling for all other covariates.

The estimated mean graduation for urban single-campus institutions is 7.74 points lower than for rural medium institutions, controlling for all other covariates in the model. The estimated graduation percentage for urban multiple-campus institutions is 7.73 points lower than for rural medium institutions, controlling for all other covariates in the model. For each additional faculty per 100 FTE students, the estimated mean graduation percentage increased by .80 points, controlling for all other covariates in the model. For each \$1,000 increase in the total aid per student, the estimated mean graduation percentage decreased by .73 points after controlling for all other covariates in the model.

Variable	Coefficient	Robust Standard Error	z	p	95% Confidence Interval	
<i>Characteristic</i> (Rural Medium Reference)					Lower	Upper
Rural Small	6.95	1.80	3.87	< 0.001	3.43	10.47
Rural Large	-4.06	0.95	-4.28	< 0.001	-5.92	-2.20
Suburban Single	-4.70	1.43	-3.29	0.001	-7.50	-1.90
Suburban Multiple	-5.47	1.04	-5.27	< 0.001	-7.51	-3.44
Urban Single	-7.74	1.15	-6.70	< 0.001	-10.00	-5.47
Urban Multiple	-7.73	1.21	-6.39	< 0.001	-10.10	-5.36
Faculty-Student Ratio	0.80	0.36	2.24	0.025	0.10	1.50
Aid	-0.73	0.29	-2.50	0.013	-1.31	-0.16
Expenditure	0.03	0.29	0.10	0.921	-0.53	0.59
Intercept	25.16	2.06	12.19	< 0.001	21.11	29.20
Random State Intercept	7.37	0.84				
Random Institution Intercept	7.11	0.55				
Random Error	6.31	0.36				

Table 1.6: Random Intercept Model Two

In the random part of the model, the between-state standard deviation is estimated as 7.37 points. The between-institutions within-states standard deviation is 7.11 points. Overall, the between-states (7.37 points) and between-institutions within-states standard (7.11) have a magnitude similar to the degree attainment coefficient for rural small. In addition, the standard deviation between observations, within institutions and states is estimated to be 6.31 points. This standard deviation is lower than the between-state and between-institutions within-state standard deviations, which can indicate that year-to-year changes for an institution (after controlling for type) tend to be less substantial than differences between institutions within a state or across states. Lastly, 6.78 is the median absolute difference in the mean associate degree attainment percentages for two randomly chosen institutions that have the same covariate values and are in the same state. It is estimated 7.03 as the median absolute difference in the mean associate degree attainment percentage for two randomly chosen states that have the same covariate values.

Using the estimates for the variance components in the intraclass correlation expressions, the estimated intraclass correlation among the latent responses in the same institution:

$$\rho(\text{institution}, \text{state}) = (7.11^2 + 7.37^2) / (7.11^2 + 7.37^2 + 6.31^2) = 0.72$$

and the corresponding estimated intraclass correlation for states is

$$\rho(\text{state}) = (7.37^2) / (7.11^2 + 7.37^2 + 6.31^2) = 0.37$$

Similar to model one, the results show that associate degree attainment changes by the institutions students attend and the institution's state. Lastly, although both models did not include Puerto Rico, having 56 observations with four unique institutions (each institution having 14 observations). I ran both models with Puerto Rico, and there was no difference in the results listed above.

1.6 Discussion

Two-year institutions play an essential role in accessing higher education because of their open access policy and location proximity to urban and rural populations where four-year institutions are absent. The purpose of this study was to examine the association between associate degree attainment by two-year institutions characteristics by location and size (rural small, rural medium, rural large, suburban single-campus, suburban multiple-campus, urban single-campus, and urban multiple-campus) while controlling for other institutional characteristics (faculty-student ratio, financial aid, and educational expenditures). The methodological strengths of this study include two random intercept models employed for 14 years using three levels of data (yearly observations by institution type within states) and differentiation between cluster-level variance and within-cluster variance. Using a random intercept model, I can account for the variance between states in the dependent variable (associate degree attainment) across all two-year institutions in the sample and within state variance

between institutions. By accounting for the between-state variance, I can account for the differences across states, such as patterns of settlement (denser settlement states versus more sprawling settlements), state funding, and overall population characteristics. By accounting for within-state variance, I can account for differences in institutions within the state. Overall, this method provides a more accurate association of two-year institutions' characteristics and degree attainment in the U.S.

This study contributes to the two-year institutions' literature in three important ways. First, it was observed that the estimated mean associate degree attainment percentage was higher for rural small institutions than rural medium institutions. From 2002-2003 to 2015-2016 academic years, rural small institutions had higher associate degree attainment than rural medium institutions. On the other hand, the estimated mean associate degree attainment percentage was lower for rural large, suburban single-, suburban multiple-, urban single-, and urban multiple-campus compared to rural medium institutions. Second, consistent with my hypothesis, the associate degree attainment percentage tends to increase as the faculty-student ratio increases. Third, although I hypothesized that the more financial aid awarded, the higher the associate degree attainment, this was different. There was a slight decrease in the estimated mean associate degree attainment percentage as per-student total aid increased. Below, I expand on the study's major findings and explain why these relationships might occur.

These findings highlight rural small and medium institutions' importance in associate degree attainment and rural students' economic contribution to their local community. Consistent with the literature on students in rural two-year institutions, Yang and Venezia (2020) found that rural community colleges achieved higher associate degree rates over three- and six-year periods than suburban and urban counterparts. Yang and Venezia's study examines two different periods (three- and six-year periods) for associate degree attainment, and it was conducted from 2004 to 2009. The present study incorporates a longer time frame (2002-2003 to 2015-2016) for all two-year institutions in the U.S. This relationship might be partially explained by the limited options for higher education that rural students have after graduating from high school (Yang & Venezia, 2020) since rural students are more likely to attend two-year versus four-year institutions (Koricich et al., 2018). Another explanation can be that students attending rural two-year institutions are more likely to enroll to receive an associate degree versus students in non-rural two-year institutions who enroll to complete courses required for their major and/or meet transfer requirements to transfer to a four-year institution where they will obtain a bachelor's degree.

Two-year institution administrators can use these results to examine the characteristics of their institutions and how they differ or mirror the graduation rates at rural small and medium institutions to increase degree attainment. One hypothesis for this relationship is that rural small and medium institutions have a different community makeup. Students in rural institutions may feel a greater sense of community in rural institutions than in larger institutions in suburban and urban locations. If students feel like they have a community, they may rely upon that community to overcome barriers. When students feel like they are part of the campus community, it legitimates and validates their presence on campus and

makes them feel comfortable to reach out and become involved in different activities (e.g., student organizations, cultural events, etc.) (Kuh et al., 2006). In turn, this could be related to a higher likelihood of graduation.

Regarding the faculty-student ratio, results are supported by previous research (Card & Krueger, 1992; Pascarella & Terenzini, 1978). Two-year institutions should aim to increase faculty numbers at their institutions because of the critical effect it has on associate degree attainment. The results of connecting the faculty-student ratio to rural small and medium institutions can be that rural institutions have a lower faculty-student ratio. As a result, they might attain higher associate degrees because students have more frequent and meaningful interactions with faculty. I included all full-time faculty members in this study, including faculty in instruction, research, and public service. Future research can examine faculty composition at two-year institutions and the relationship to associate degree attainment.

In efforts to understand the negative association between associate degree attainment and the increase in financial aid, I divided the financial aid per student into three categories: small (less than \$2,000), medium (more than or equal to \$2,000 and less than \$5,000), and large (more than or equal to \$5,000) to see if there was a difference by the amount of financial aid allocation. I ran a separate random intercept model (similar to Model 2). The random intercept model will allow us to analyze the association between degree attainment and financial aid for all three levels (small, medium, and large) while differentiating between state variance on associate degree attainment across all two-year institutions and within state variance for each institution. For a small financial aid allocation, the estimated mean graduation percentage increased by 2.11 points in comparison to the large financial aid allocation after controlling for all other covariates. The estimated mean graduation percentage increased by .96 points for a medium financial aid allocation compared to a large financial aid allocation after controlling for all other covariates.

I encourage readers to exercise caution when interpreting this result. Some may argue that financial aid needs to be reduced because it negatively affects degree attainment. First, this study only includes students eligible to receive financial assistance. Although other students qualify financially to receive financial aid because of their socioeconomic status, due to additional federal requirements, they do not qualify. For example, some immigrant students are not eligible for financial aid because of their migration status. Particularly, more immigrant students attend two-year institutions compared to other higher education institutions (Teranishi et al., 2011). Since this study did not control for students who are eligible and not eligible to receive financial aid, I cannot conclude that financial aid has an overall negative effect on degree attainment.

Second, previous research shows that rural community college students depend greatly on financial aid, as the majority receive Pell Grants (Kennamer et al., 2010). Dowd and Coury (2006) argue that higher grants generally indicate a lower socioeconomic status. Since students have higher financial aid needs, the amount of financial aid provided may not be large enough to impact associate degree attainment positively. Lastly, another explanation of the negative impact of financial assistance on associate degree attainment could be that not all students who qualify to receive financial aid accept their aid. For example, students

who want to transfer to four-year institutions might save their financial aid once they transfer since two-year institutions are more affordable.

Overall, this study showed how two-year rural institutions are essential for rural students to access higher education and upward social mobility. In particular, low-income rural students can earn a higher income with an associate degree and have a positive economic and social well-being impact on their local community (Yang & Venezia, 2020). Some of the reasons why two-year rural institutions have higher associate degree attainment can be due to students in rural institutions primarily enrolled to receive an associate degree. In contrast, students at suburban and urban institutions enroll in two-year institutions, intending to transfer to four-year institutions. Students do not plan to earn an associate's degree along the way. Castañeda (2002) highlighted how rural areas have lower transfer rates than those from the suburbs and cities. Overall, although suburban and urban had lower associate degree attainment, suburban and urban two-year institutions play a different role in the transfer gateway for students in higher education.

Lastly, this paper's implications highlight the importance of the two-year institutions' characteristics and the relationship to degree attainment. Since two-year institutions play a critical role in students' pathways to higher education, many of these students transfer to four-year institutions after receiving an associate degree. Ma and Baum (2016) stated that although two-year institutions provide access to higher education, most students in this sector do not receive a credential, and completion rates have been stagnant. When students transfer with a degree from a two-year institution, students have more stability in their future (e.g., employment and salary). On the other hand, students who dropout of college after entering a four-year institution without earning an associate degree can have a harder time joining the workforce than those who received an associate degree at a two-year institution before transferring. Particularly for students who received loans during college, it can add financial burden in paying them without a stable job and lower pay. It is important to continue to examine the individual characteristics of two-year institutions associated with degree completion to help students in their academic pursuits, not only for the associate degree but also for those who transfer to four-year institutions.

1.7 Limitations and Future Research

The study has a few limitations. First, I only examined the data from the 2002 to 2015 academic year due to the data source. Further research should look at additional years beyond 2015. Second, this study does not include Tribal Colleges ($n = 266$). It will be essential to conduct a study focusing only on Tribal Colleges to understand the association between associate degree attainment and institutional type. Finally, further studies that include other factors I did not control for that possibly contribute to degree attainment need to be undertaken. Specifically, exploring other characteristics that distinguish the differences between rural two-year institutions and suburban and urban institutions would be

interesting. Another possibility is variables contributing to student success (e.g., counselors-student ratio, campus resources, etc.).

1.8 Appendix

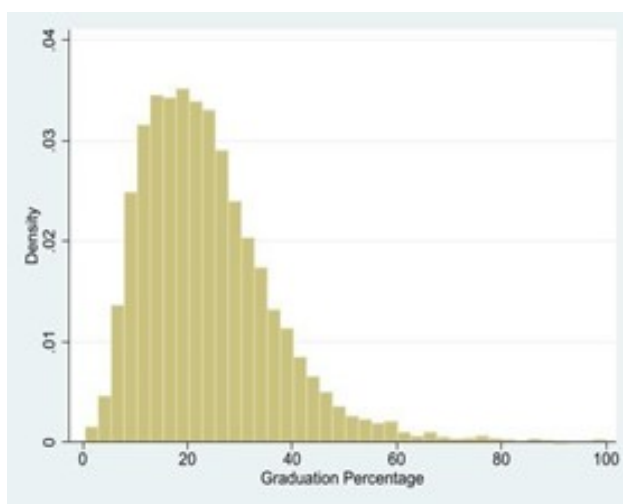


Figure A2: Graduation percentage

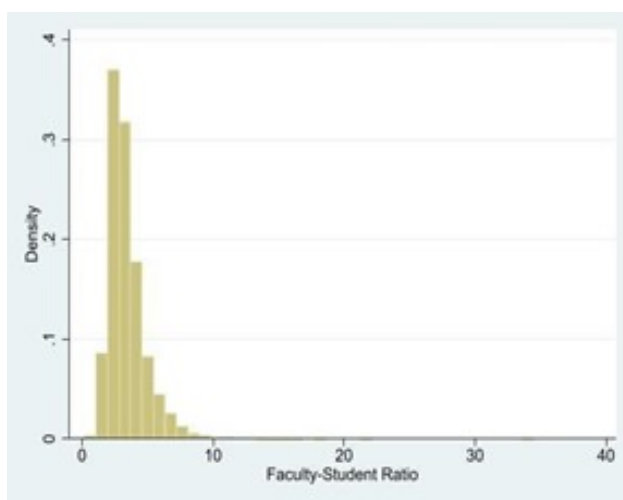


Figure A3: Faculty (per 100 FTE students)

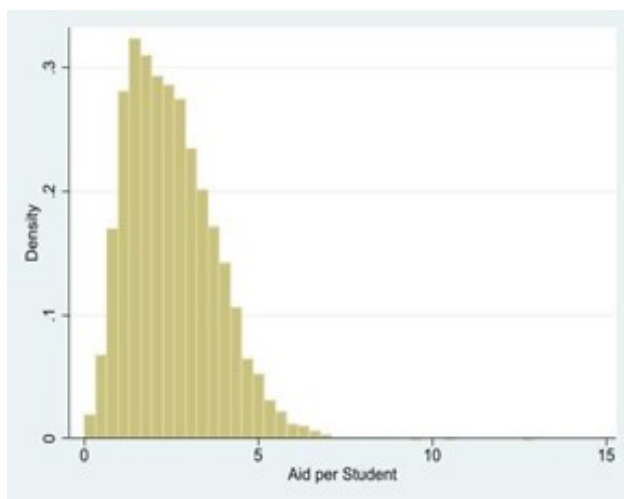


Figure A4: Aid (per 1 FTE student by \$1,000)

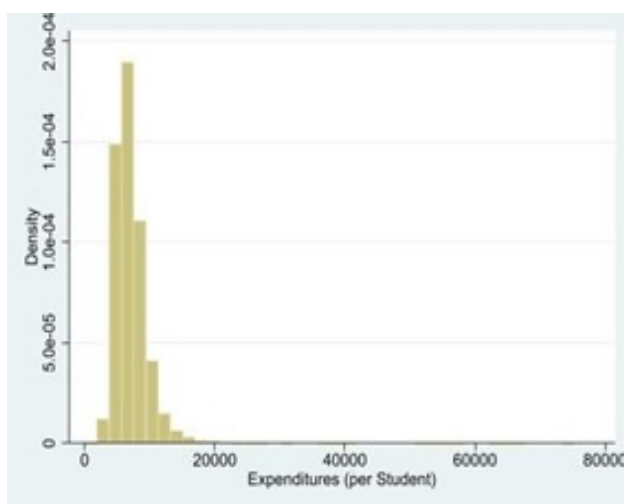


Figure A5: Expenditures (per 1 FTE student)

State	Freq.	Percentage	State	Freq.	Percentage
California	1,050	9.63	New Mexico	98	0.9
North Carolina	812	7.45	Wyoming	98	0.9
Texas	742	6.8	Maine	84	0.77
Illinois	532	4.88	Utah	76	0.7
Georgia	441	4.04	Idaho	42	0.39
New York	406	3.72	Montana	42	0.39
Washington	397	3.64	West Virginia	42	0.39
Michigan	388	3.56	North Dakota	35	0.32
Kansas	345	3.16	Alaska	28	0.26
Alabama	336	3.08	Indiana	25	0.23
Minnesota	336	3.08	Nevada	19	0.17
Virginia	322	2.95	Kentucky	14	0.13
Ohio	297	2.72	Rhode Island	14	0.13
Arizona	266	2.44	Total	10,902	100
New jersey	266	2.44			
Oregon	238	2.18			
Florida	230	2.11			
Iowa	224	2.05			
Massachusetts	224	2.05			
South Carolina	224	2.05			
Wisconsin	215	1.97			
Maryland	210	1.93			
Colorado	206	1.89			
Mississippi	196	1.8			
Pennsylvania	196	1.8			
Arkansas	182	1.67			
Missouri	182	1.67			
Tennessee	182	1.67			
Connecticut	168	1.54			
Oklahoma	168	1.54			
Louisiana	98	0.9			
Nebraska	56	0.51			
New Hampshire	56	0.51			
South Dakota	56	0.51			
Delaware	42	0.39			

Table A7: Institution Observations by State

Level	< \$7, 098.46 Expenditures (per 1 FTE)	≥ \$7, 098.46 Expenditures (per 1 FTE)
Rural Small	421	847
Rural Medium	2,062	1,663
Rural Large	1,143	582
Suburban Single	989	475
Suburban Multiple	749	369
Urban Single	217	186
Urban Multiple	858	338
Total	6439	4460

Table A8: Two-way Table for Each Carnegie Classification and Expenditure per 1 FTE Students

Study 2

Measuring Undergraduate Student College Adjustment at an Elite Public Institution: Instrument development and validation

2.1 Abstract

Universities hold significance in bolstering students' educational pathways. Students' college experiences may diverge in numerous ways throughout their years from freshman to senior. These experiences can positively or negatively impact students' academic and social progress, determining retention and graduation rates. To quantify these experiences, I designed and validated an Undergraduate Student College Adjustment Instrument that measures students' adjustment levels at an elite public institution on the West Coast. When examining undergraduate student adjustment, research traditionally has looked at factors (e.g., social and academic integration) separately; as a result, these studies may have overestimated the significance of certain relationships in college adjustment and/or have only focused on a particular student demographic population. This research contributes to the field of higher education in three ways: first, the development and validation of an instrument measuring college adjustment levels incorporating five domains: academic belonging, student agency, community, faculty and academic advisor support, and equity; second, using an intersectional lens of students' identities to examine if this new instrument can be used for transfer and non-transfer students and first-generation and non-first generation students. Lastly, it examines the adjustment levels for a historically underrepresented group in higher education, Latinx students, at an elite public institution.

Keywords: instrument development and validation, college adjustment, transfer students, Latinx students

2.2 Introduction

Because of systematic barriers, differences in the type of education exist based on race, class, gender, and migratory status. Bowles and Gintis (2002) note that schools are portrayed as promoting equality, even though schools often sort students into education and jobs that reflect their parents' socio-economic status. Across social class and race, students receive a different quality of education from pre-kindergarten to higher education. As a result, this continues the reproduction of class structures through education and labor market participation (Apple, 1979). Higher education is a crucial pathway for first-generation, low-income, and historically underrepresented students for upward social mobility (Ma & Baum, 2016). Once students reach college, their experiences are shaped by their inherited privileges, intersecting identities, and institutional barriers at universities, such as enrolling for classes, financial aid, and other requirements (Anyon, 1981; Bourdieu, 1977; Martin, 2012). First-generation college students have an additional barrier to academic success due to the hidden curriculum (e.g., norms, values, and expectations at college) (Pascarella et al., 2004). While students in the dominant class benefit from the hidden curriculum, first-generation students need to gain the knowledge to navigate the higher education system. As a result, underrepresented students need help to adjust to a new academic culture, often experiencing an alienating system (T. Yosso et al., 2010).

As higher education scholars work towards understanding how to improve degree attainment for historically underrepresented students, it is important to investigate students' college experiences, focusing on college adjustment, using a critical race theory lens (T. Yosso et al., 2010). By understanding how students' identities shape these experiences, higher education professionals can provide targeted programming and resources to increase the attainment of bachelor's degrees for historically underrepresented students. This study contributes to the college adjustment body of literature by developing and validating a new instrument that measures students' adjustment levels in college using an intersectionality lens. My research explores how these identities interact with privilege and power imbalances, shaping students' experiences.

The motivation for this instrument is to capture students' experiences at an elite public institution since students' experiences in higher education can vary based on institutional characteristics and the type of institution students enrolled in (M. J. Mayhew, 2016). Institutions play an important role in shaping students' educational pathways (Alon & Tienda, 2005; Melguizo, 2008). For example, prior work has examined gender differences in student engagement and college outcomes for African American students at historically Black colleges and universities (Harper et al., 2004). Harper et al. (2004) found that African American women had similar levels of engagement experiences as their male African American peers. Cabrera et al. (2016) examined the role of perceptions of prejudice and discrimination on adjustment to college processes for African American and White students. Their results showed that discrimination and prejudice negatively impacted ethnoracially minoritized students' adjustment (Cabrera et al., 2016). In addition, the work by Tomlinson-Clarke and Clarke (1994) looked at different predictors (e.g., high school GPA) of social adjustment and

academic achievement for female students. Their findings showed that nonacademic variables associated with co-curricular involvements were predictive of students' social adjustment for students in the pre-college leadership program and students not in the pre-college leadership program (Tomlinson-Clarke & Clarke, 1994).

The literature on Latinx students in higher education has focused on all the stages, from considering college, choosing a university, college experience, and degree attainment. For example, Latinx college choice examines the role of families in college-going models using an asset-based lens (Acevedo-Gil, 2017; Garcia et al., 2021). Once Latinx students enroll in college, the literature on Latinx college adjustment focuses on the role of social class in students' adjustment (Santiago et al., 2019), college adjustment differences for first-generation college students (Duncheon, 2018), racial climates experienced by Latinx students (Hurtado et al., 1996; T. Yosso et al., 2010), community connections and family support as important aspects that impact Latinx college adjustment (Cabrera et al., 1999). There is a gap in the literature on Latinx students' diverse college experiences attending elite public institutions. To address the gap in the existing literature, this new instrument measures undergraduate students' adjustment levels from campus identity to campus alienation. First, the instrument measures how students adjust to campus in five domains (academic belonging, community, student agency, faculty and major advisor support, and equity). Second, this instrument allows for investigating the association between adjustment levels and time spent at the university. Third, this instrument will examine the adjustment levels of Latinx students in comparison to their Asian and White peers. Lastly, this instrument is validated for transfer, non-transfer, and first-generation and non-first-generation students.

2.3 Theoretical Framework

This project uses Tinto's (1975, 2012) theoretical framework, which guided the selection of four of the five domains of the instrument. Tinto states that academic and social integration are complementary but independent processes by which students adjust to college life (Tinto, 1975, 2012). Under Tinto's framework, academic integration is a product of grade performance and academic and intellectual development. Social integration is a product of peer group interactions and faculty interactions. Tinto's framework considers an individual's characteristics, family background, and pre-college schooling before entering college. Additionally, Braxton et al. (1997) suggest that support for social integration as a predictor of persistence is more forceful than for academic interaction.

Berger's (1997) construct of Sense of Community has also been used to examine student persistence while identifying sources of social integration. Berger elaborates on a revised version of Tinto's model. Although Berger adds a longitudinal component, only the first-year persistence is examined. I expand on the literature by looking at all academic years (Berger, 1997). There is a gap in the literature regarding adjustment experiences for Latinx students at elite public institutions. I developed and validated an instrument that measures students' adjustment while incorporating and clustering all five domains within academic

integration (academic belonging and student agency) and social integration (community, faculty and major advisor support, and equity). This instrument expands on the work of Tinto and Berger by including an equity domain, focusing on an elite public institution. Traditionally, work has focused on differences between private and public school students (M. Mayhew et al., 2011). The literature on college effects examines student retention, persistence, and degree attainment differs by the type of institutions students attend (public versus private) (Chen, 2012; Niu & Tienda, 2013). In this study, I focused on elite public institutions to understand students' experiences.

2.4 Literature Review

Research shows many factors contributing to students' success at four-year institutions. These factors include - but are not limited to - students' academic achievement, institution characteristics, resources provided by the university, campus, and academic environment (Ma & Baum, 2016). Traditionally, factors are categorized into student characteristics and institutional characteristics. Research findings by Hawley and Harris (2005) suggest that student characteristics impacting persistence can be classified into three categories: barriers, motivations and aspirations, and expectations. On the other hand, institutional characteristics include class size, amount of funding allocation, and student-faculty ratio, among other factors. In the sections below, I expand on the literature for each domain in the instrument.

Academic Belonging

The work of Maslow (1970) contributed to the work of a sense of belonging and social acceptance throughout individuals' lives. In addition, interpersonal relationships (emotional bonds) with others are essential for individuals' overall development (Baumeister & Leary, 2007). Overall, the college experience also contextualizes a sense of belonging. Institutions are important spaces for developing and reflecting belonging, meaning students have an identity (Souza, 2016). As Peter et al. (2015) noted, academic belonging is fundamental to students via the teaching and learning process. Students feel empowered, motivated, and productive when they feel part of the system (Marcelo Zaffalon Peter et al., 2016). Overall, academic belonging is important for students' college adjustment. If students do not feel like they belong academically at the classroom level within the institution, they might not be able to complete their courses. Ultimately, as students adjust to a new academic setting, the sense of academic belonging plays an important role in their adjustment and degree attainment success (Strayhorn, 2018). Freeman et al. (2007) studied the association between undergraduate students' sense of class belonging and their academic motivation in class, their sense of class belonging, perceptions of their instructors' characteristics, and their class and campus-wide sense of belonging. These findings showed an association between (1) students' sense of class belonging and their academic self-efficacy, intrinsic motivation, and task values and (2) students' sense of class-level belonging and their perceptions of instructors' warmth

and openness. This encourages students to participate and (3) their sense of university-level belonging and their sense of social acceptance (Freeman et al., 2007).

While academic belonging is a domain that students need to navigate, the community within the larger university campus is also important to examine. Academic belonging and community adjustments can be experienced differently by students. For example, the work by Tovar et al. (2009) found an association between belonging at the academic and social integration into the university and student retention and graduation. Students can have uneven adjustment levels within the class and the larger campus community. It is important to consider both academic and community components as we develop a more holistic and representative measurement of students' college adjustment.

Community

Community is an important factor in understanding students' adjustment. When students feel like they are full members of the campus community, they can thrive and contribute to the community (Berger, 1997; Jacobs & Archie, 2008). When students feel like they are part of the campus community, it legitimizes and validates their presence on campus. Belonging may also make students feel comfortable to seek help when facing barriers while supporting their involvement in different activities (e.g., student organizations, cultural events, etc.) (Kuh et al., 2006). This sense of community, in turn, is related to academic success. For example, research shows that high academic and community integration levels lead to a more significant commitment to the institution (Bean, 1983). As a result, commitment increases the likelihood of persistence and graduation. The community can also be related to student agency, as Bean (1983) defined. Students' agencies allow them to seek resources or find communities where they feel welcome.

Student Agency

As students navigate higher education, they can experience challenges. As part of students' adjustment process to a new education system, they learn how to enroll in classes and find resources at their new campus (Chin-Newman & Shaw, 2013). As Thomas (1980) defined, the agency plays a critical role in students' learning process and institutional strategies for increasing academic outcomes. Overall, student agency is how students use learning strategies and how to navigate their institutions. Expanding on student agency, Jääskelä et al. (2021) use a multidimensional approach centered on how a student experiences accessing resources due to their agency. I am particularly interested in student agency as it relates to students' adjustment to learning institutional processes and the university's hidden curriculum (Anyon, 1981), as this allows students to navigate campus and overcome structural barriers.

Faculty and Advisor Support

It is vital to examine the effect of faculty and advisor support on students' adjustment because of its cascade effect on students' academic trajectories. Research has shown a positive impact of academic advising on students' engagement and satisfaction and its relationship with graduation rates at four-year institutions (Kuh et al., 2006). Pascarella and Terenzini (1976) identified that positive faculty-student interaction, formal and informal, helps students develop a more robust perception of their academic goals and intellectual development. Overall, both faculty and advisor support is crucial to students' adjustment. Faculty and advisor support is critical for college trajectories, particularly for historically underrepresented students. For example, Tovar (2015) found that positive interactions with faculty and academic counselors are essential to Latinx students' persistence. When faculty pay attention to students, it helps to increase retention rates.

Equity

Lastly, equity is critical to students' adjustment because of higher institutions' role in making higher education more equitable for all students. I use the definition of equity by Fuentes et al. (2021), which is the creation of opportunities for historically underrepresented students, thereby allowing them equal access to and participation in different educational programs on campus. Access to various resources and support programs can contribute to closing the achievement gap in students' degree attainment. Overall, this study incorporates five domains: academic belonging, student agency, community, faculty and academic advisor support, and equity, in efforts to measure college adjustment from campus alienation to students having campus identity. While using an intersectional lens of students' identities and how their adjustment level varies by transfer and first-generation status, the following research questions were posed:

1. What are students' adjustment levels at an elite public institution?
2. As the number of semesters enrolled increases, do students' adjustment levels increase?
3. How do average adjustment levels differ among Latinx compared to Asian and White students?
4. Can this instrument measure first-generation and non-first-generation college students' adjustment?
5. Can this instrument measure transfer and non-transfer students' adjustment?

2.5 Method

Construct Development

I use the Four Building Block Model described by Mark Wilson (2004). In the construct map, there are four adjustment levels. The respondents were given fixed response types of items in the survey. After taking the survey, students were placed into four adjustment levels (see Figure 2.1). The construct map for my instrument is divided into the respondents (left side) and the responses (right side), ranging from the direction of increasing adjustment level (bottom – *Level 0 Campus Alienation*) to the direction of decreasing adjustment level (top – *Level 3 Campus Identity*). Below is a description of each adjustment level:

Level 0 Campus Alienation

Students disagree strongly about feeling like they belong academically. Students disagree strongly about feeling like they are part of and having a community on campus. Students never feel like they have the agency to seek help when needed. Students never feel accepted by professors and academic advisors. Students disagree strongly that the institution adequately addresses issues related to equity.

Level 1 Uncomfortable

Students disagree somewhat about feeling like they belong academically. Students disagree somewhat about feeling like they are part of and having a community on campus. Students occasionally feel like they have the agency to seek help when needed. Students occasionally feel accepted by professors and academic advisors. Students disagree somewhat that the institution adequately addresses issues related to equity.

Level 2 Comfortable

Students agree somewhat about feeling like they belong academically. Students agree somewhat about feeling like they are part of and having a community on campus. Students often feel like they have the agency to seek help when needed. Students often feel accepted by professors and academic advisors. Students agree somewhat that the institution adequately addresses issues related to equity.

Level 3 Campus Identity

Students agree strongly about feeling like they belong academically. Students agree strongly about feeling like they are part of and having a community on campus. Students very often feel like they have the agency to seek help when needed. Students very often feel accepted by professors and academic advisors. Students agree strongly that the institution adequately addresses issues related to equity.

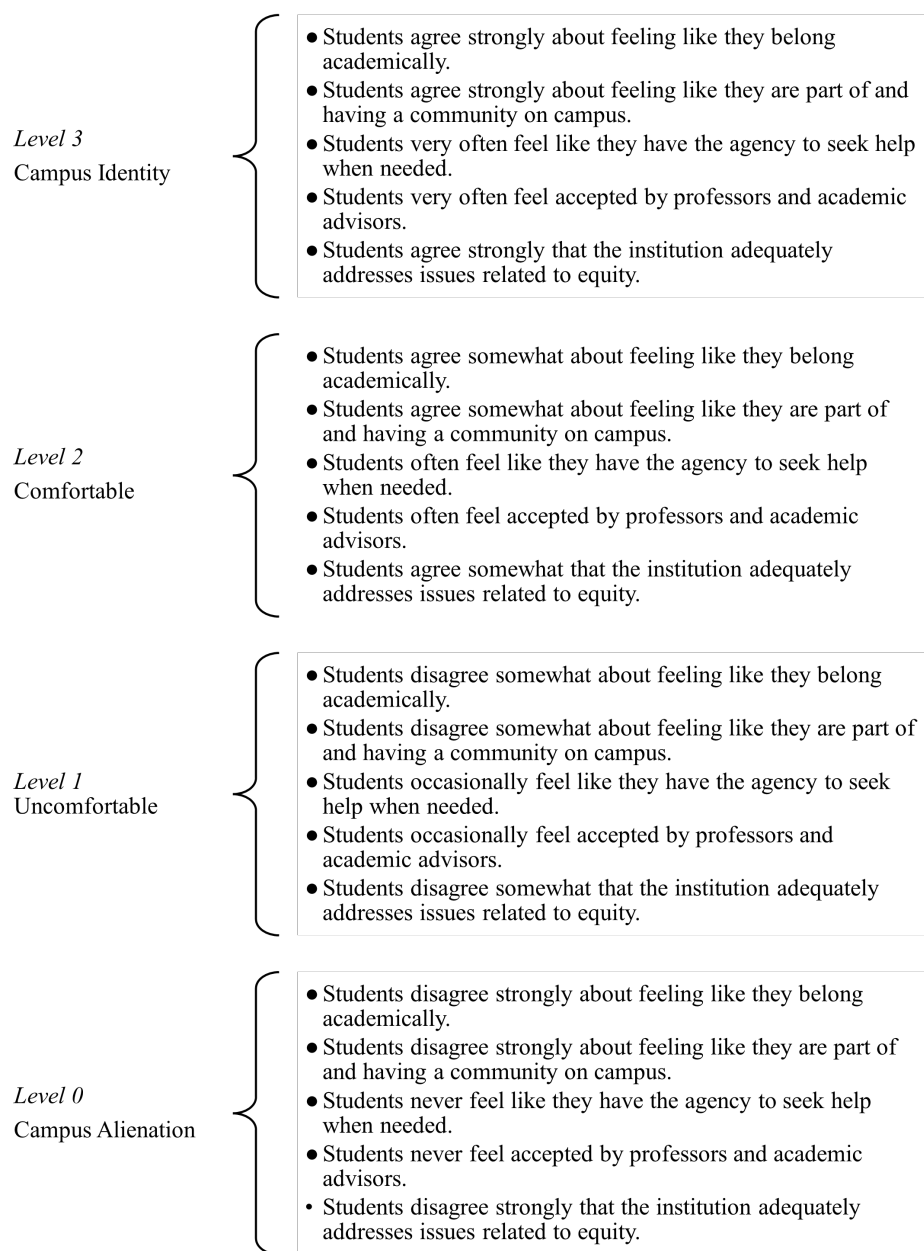


Figure 2.1: Undergraduate College Transition and Adjustment Construct Map

Design of Instrument

The variable to be measured is student adjustment level. Based on the pilot instrument validation results (Fall 2021), I created a shorter survey for the data collection with 130 questions for Spring 2023 (see Appendix A; Survey A1). The survey was divided into seven dimensions (see Figure 2.2). These dimensions focus on the five major domains that comprise students' adjustment levels and include two additional sections: navigating the transition process and college satisfaction. Only 65 items were used to calibrate the instrument. These 65 items were selected because they were part of the five domains of interest for the instrument (academic belonging, student agency, community, faculty and academic advisor, and equity). Omitted variables included specific questions for transfer, parent, veteran, and first-generation students. These variables could not be scored across all students (e.g., students who are not transfer or parent students). Table 2.1 lays out the number of questions in each adjustment domain. The last section of the survey included demographic questions.

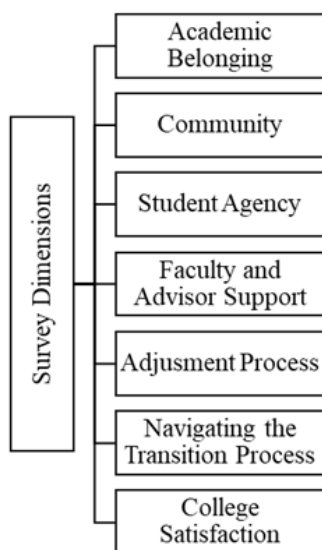


Figure 2.2: Undergraduate College Transition and Adjustment Survey Dimensions

Adjustment Component	Number of Questions
Academic Belonging	13
Student Agency	14
Community	11
Faculty and Academic Advisor Support	15
Equity	12
College Satisfaction	15
Demographic Information	28

Table 2.1: Undergraduate College Transition and Adjustment Survey Questions Composition

Generation of Items

Items were primarily used from two previous surveys that measured students' adjustments (Harbin, 1997; Laanan, 2004). I used the Laanan (2004) survey because it is an instrument used to collect data to understand transfer students' adjustment process at a four-year institution. From the Laanan survey, I use questions about "community college factors" related to course learning for the academic belonging dimension. For example, "Took detailed notes in class" (Item 2_1). I also used questions under "university factors" related to experiences with faculty for the faculty and academic advisor support dimension. For example, "Felt comfortable approaching faculty outside of class" (Item 12_1).

The Harbin (1997) survey is particularly used for transfer students attending four-year institutions in the state where the study occurred. Questions from the Harbin survey related to problems students experienced after starting at the four-year institution. I used them for the faculty and academic advisor support dimension. For example, "I did not like my academic advisors" (Item 13.3). Lastly, I used the equity dimension's modified version of Byrd (2019). Particularly, I used the question, "The college adequately addresses issues related to" (Item 15).

Overall, these three surveys were extensive in the number of questions. I created a short survey to avoid students' fatigue when answering the surveys. The survey used in this study was part of a larger research project and included 130 items, Likert-style, multiple choice, and open-ended questions. Only 65 survey questions were used to validate and calibrate this instrument for this paper. The larger survey also included six open-ended and 15 college satisfaction questions to examine the association of Latinx college adjustment on college satisfaction. These 21 questions were not used in this paper's instrument validation and calibration. They were used in the analysis of paper three of the dissertation.

Scoring of Items

The survey included Likert-style scale questions, multiple-choice, and open-ended items. Only the Likert scale questions were used to score participants' responses. Likert scale ques-

tion responses included *Never, Occasionally, Often, Very Often; Not Familiar, Somewhat Familiar, Familiar, Very Familiar*; and *Disagree Strongly, Disagree, Agree Somewhat, and Agree Strongly*. Each item consisted of responses theorized to be equivalent to the levels on the construct map (Figure 2.1). The Likert scale questions allowed one to score and place participants' responses directly into the construct map. For example, if a student responded *Never* to taking notes in class, the item's response was placed on *Level 0* of the construct map. If a student answered, *Very Often*, the item's response was placed on *Level 3* of the construct map.

Data

Data was collected during the Spring 2023 Semester at an elite public institution in the Pacific Northwest using the Elite Institution System Software (EISS). This elite public institution is a coeducational college. The undergraduate student enrollment for Fall 2022 consisted of 32,831 and for graduate students, 12,914. Asian and non-white students are a large representation of underrepresented students by racial and ethnic category, followed by Hispanic/Latino, White non-Hispanic, Black or African American non-Hispanic. American Indian or Alaska Native non-Hispanic and Native Hawaiian or other Pacific Islander non-Hispanic are the least represented in the undergraduate student population.

Data was collected via the Undergraduate Student College Transition and Adjustment (USCTA) survey (see Appendix A; Survey A1). The survey was emailed to targeted programs for historically marginalized groups, major academic advisors, undergraduate courses, undergraduate student organizations, and affinity group centers on campus. The survey was distributed for five weeks, from April 26 to May 26, 2023. During the Spring 2023 semester, I conducted the study at a West Coast elite four-year public institution. Data collection occurred for five weeks. Descriptive analysis was conducted using Stata statistical software.

Data Analysis and Instrument Validation

The data analysis and instrument validation will consist of four steps: descriptive statistics, instrument calibration, reliability, and validity. First, descriptive statistics was done using Stata statistical software. Second, instrument validation was conducted using EISS. The instrument calibration included: (1) the generation of a Wright Map to associate the empirical data to the hypothesized construct map, (2) item fit was examined using the in-fit mean square statistics and graph for the average item location and item step location, and (3) person fit was examined using a histogram, mapping the estimated person location. Third, reliability assessment will consist of (1) internal consistency examining the consistency of measuring individuals via separation reliability was examined using the Expected A Posteriori (EAP; empirical Bayes estimates) and Weighted Likelihood Estimates, and (2) alternative forms of the survey were performed to find the reliability coefficient of the instrument. Fourth, the validity assessment followed a six-strand method following the "Testing Standards" (M. Wilson, 2004; V. R. Wilson, 2007). Content validity was checked by the

three initial stages of the building blocks in step one, response process exit interviews were conducted with participants after completing the survey to obtain evidence that supports the item design in step two, instrument level validity was performed using the Spearman's rho (rank-order correlation between hypothetical and empirical ranks of the item difficulty). There should not be any threshold overlap between the hypothetical and empirical ranks of the item difficulty. If threshold overlap appears, it indicates a weak relationship between the empirical finding and the theoretical expectations of the construct map. In step three, the item level was examined by the mean WLE for each item ranked from lowest to the highest score. In step four, external variable validity was established by examining the relationship between students' performance on the instrument and variables outside the instrument in step five. Lastly, consequence validity investigated possible positive or negative outcomes from using this instrument.

2.6 Results

Descriptive Statistics

A total of 203 students responded to the survey. Data cleaning included using responses when respondents answered 82% or more of the survey to obtain the best model calibration and validation. The final sample included 175 respondents. More female students participated ($n = 102$) than male students ($n = 27$) and non-binary/non-conforming ($n = 9$). The highest group represented in the sample was Hispanic/Latina(o)(e)(x) ($n = 60$, 34.29%), followed by Asian ($n = 44$, 25.14%), White or Caucasian (Non-Hispanic) ($n = 11$, 6.29%) and in total 14 students selected Other as their identity (8%). The age in the sample ranged from 18 to over 70 years old (see Table 2.2). One student listed their age as "over 70." I then converted age into a categorical variable. The most frequent age groups are 18-20 ($n = 70$, 40%), followed by 21-24 ($n = 53$, 30.29%), and 27-36 years old ($n = 8$, 4.57%). None of the students listed their age as 25 or 26 years old.

Students reported their parents' total household income last year. The most frequent income brackets are less than \$20,000 ($n = 30$, 17.14%), followed by \$80,000 to \$149,999 ($n = 29$, 16.57%) and \$20,000 to \$39,999 ($n = 17$, 9.71%). Almost half of the students are first-generation ($n = 86$, 49.14%). Thirty-eight students identified as students with a disability (21.72%). Only five students were reported to be student parents (2.86%). Thirty-seven students in the sample are transfer students (21.14%).

Variable	Category	n	%
Gender	Female	102	58
	Male	27	15
	Non-binary/non-conforming	9	5
	Prefer not to answer	1	1
	Missing	36	21
Race	Asian	44	25
	Black or African	2	1
	Hispanic/Latina(o)(e)(x)	60	34
	Indigenous/Native/American Indian	1	1
	Middle Eastern or North African (MENA)	2	1
	White or Caucasian (Non-Hispanic)	11	6
	Other	14	8
	Missing	41	23
Age	18-20	70	40
	21-24	53	30
	27-36	8	5
	41- Over 70	6	3
	Missing	38	22
SES	Less than \$20,000	30	17
	\$20,000 to \$39,999	17	10
	\$40,000 to \$59,999	11	6
	\$60,000 to \$79,999	22	13
	\$80,000 to \$149,999	29	17
	\$150,000 to \$199,999	8	5
	\$200,000 or more	16	9
	Missing	42	24
First-Generation	Yes	86	49
	No	50	29
	Do not know	1	1
	Missing	38	22
Transfer Student	Yes	37	21
	No	99	57
	Missing	39	22

Table 2.2: Tabulation of Gender, Race, Age, SES, First-generation, and Transfer Students

Instrument Calibration

The first step was to generate a Construct Map using EISS. Figure 2.1 shows the association of the hypothesized construct map and the item responses that were expected to match a

given level. The Wright map (Figure 2.3) shows the Thurstone thresholds for each item and how they relate to the underlying construct. Each threshold shows the distribution of students and items. Overall, the Wright Map shows a consistent pattern between the three levels (*Uncomfortable*, *Comfortable*, and *Campus Identity*), with a few overlaps between the levels.

Looking for “banding” across the map according to the hypothesized construct level, there are a few items (Item 10_03, Item13_03, and Item13_04) that are not good at distinguishing between the adjustment levels (highlighted in red in Figure 2.3). Item 10_03 asks to rate from *Never* to *Very Often* the following question: “I either attend meetings, am an active member, and/or hold a leadership position(s) in a faith-based organization.” There is a small distance between all three adjustment levels. For this question, 160 students selected *Never*, ten selected *Occasionally*, three selected *Often*, and two selected *Very Often*. This question is not good at distinguishing between the adjustment levels, indicating that this item needs to be removed from future surveys.

Item 13_03 and Item 13_04 ask to rate from *Very Often* to *Never* the following questions: “I did not like my academic advisor” and “I did not trust my academic advisor.” The “banding” between Uncomfortable and Comfortable levels for both items. The only difference between the two questions is like or trust. Perhaps the similarity of the questions could have confused the students. Another explanation is that it was hard for students to distinguish between the two questions. Overall, this suggests rephrasing and combining the two questions for future studies.

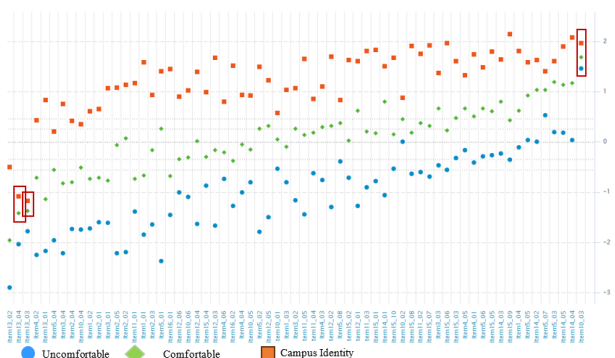


Figure 2.3: Wright Map for Student Adjustment Level for All Participants by Item



Figure 2.4: Wright Map for Student Adjustment Level for All Participants

Item fit

Item fit was investigated using an infit mean square graph for average item location and item step location (Figure 2.5). In other words, infit explores how accurately or predictably the data fit the model. As such, in mean square fit statistics, 1.0 is their expected value, indicating little distortion of the measurement system. The infit mean square values for item step location should lie in the desired range between 0.75 and 1.33. Looking at Figure 2.5, I only found one high fit value. This suggests that there are some aspects of the design of this item that need further investigation. In this case, it was Item 10_02 with an infit mean square value of 1.38. This item asks to rate the following statement: “I either attend meetings, am an active member, and/or hold a leadership position(s) in a student cultural organization” from *Never*, *Occasionally*, *Often*, and *Very Often*. For this question, 88 students selected *Never*, 36 selected *Occasionally*, 23 selected *Often*, and 28 selected *Very Often*. This question is not good at distinguishing between the adjustment levels, indicating in a future survey it needs to be removed. The distribution of this question is spread across three adjustment levels, and more students selected *Never*.

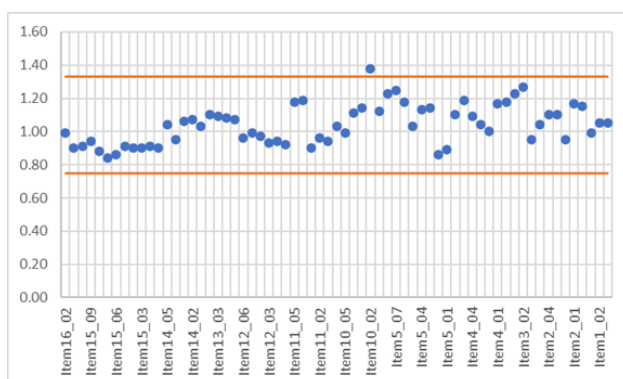


Figure 2.5: The infit Mean Square Graph for Average Item Location

Person Fit

Figure 2.6 shows the person distribution. It is normally distributed with one possible outlier between the first and second logits. This outlier indicates that one person's location was outside the normal distribution compared to the other respondents in the sample. The following section interprets the results of the instrument validation, including reliability and validity.

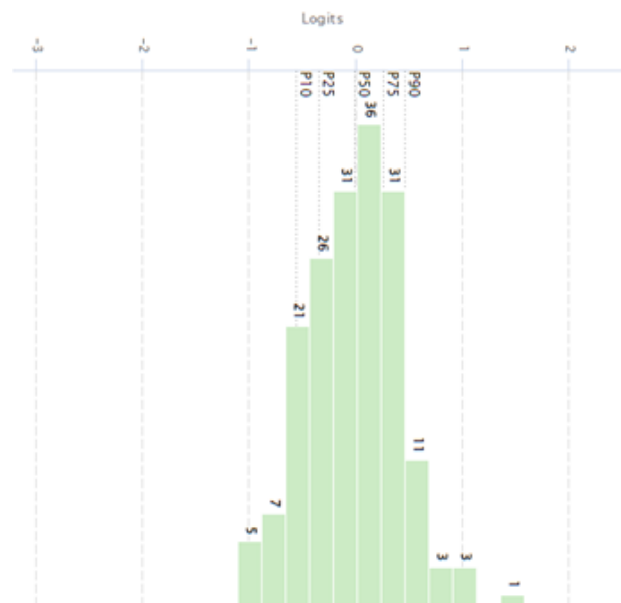


Figure 2.6: Histogram of Estimated Respondents' Locations

Reliability

Internal Consistency

Reliability investigates how consistent the instrument is in measuring individuals. First, I examined the proportion of the total variance accounted for by the model for internal consistency. Two estimates were obtained directly from the EISS calibration using the Expected A Posteriori (EAP; empirical Bayes estimates) and Weighted Likelihood Estimates (WLE). The separation reliability for the student adjustment level instrument was strong, with 0.901 (EAP) and 0.881 (WLE). These estimates indicate that the instrument is reliable in measuring students' adjustment levels.

Alternate Forms

Second, the consistency of the measurement was also examined by investigating an alternate form reliability coefficient of the instrument. After students completed the entire survey, the instrument was divided into two versions (Form A and B), creating two almost identical forms. Forms A and B were done to test reliability using a smaller survey version. For example, Form A had the following question: “I thought about practical applications of the class material to real-life problems.” versus Form B, “I worked on a paper or project where I integrated ideas from various sources.” Form A had 32 questions, and Form B had 33 questions (see Appendix A; Survey A2 and A3).

A calibration was performed on both forms. The separation reliability for the student adjustment level instrument – Form A was strong, with an EAP of 0.772 and a WLE of 0.779. The separation reliability for the student adjustment level instrument – Form B was also strong, with an EAP of 0.770 and a WLE of 0.764. Figure 2.7 shows the distribution of students and items for the alternative Form A. Figure 2.8 shows the distribution of students and items for the alternative Form B. The two distributions of respondents are quite similar, and both are distributed roughly normally (Figures 2.7 and 2.8). In addition, I used the Spearman-Brown formula to calculate the adjusted reliability: it was 0.86 out of a possible value of 1.00. As both forms performed well in terms of reliability, either of the alternate forms could be used independently to measure students’ adjustment levels.

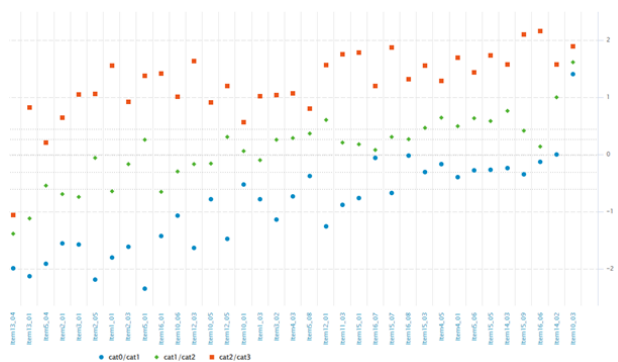


Figure 2.7: Wright Map for Alternate Form A

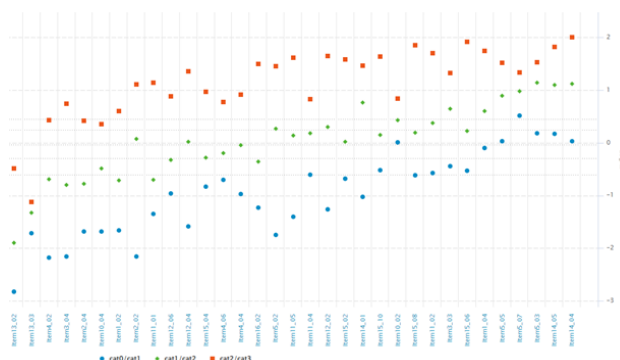


Figure 2.8: Wright Map for Alternate Form B

Validity

Validity is the degree to which the test measures students' adjustment levels. Validity follows a six-strand method based on the "Testing Standards" (M. Wilson, 2004; V. R. Wilson, 2007).

Content Validity

First, evidence-based instrument content indicates how good the instrument is at measuring the concepts in which a researcher is interested. The evidence-based instrument content was done by completing the three initial stages of the building blocks. I first designed the construct map and received feedback from other students in a graduate-level Measurement in Education and Social Sciences class, professors, and current undergraduate students at an R1 elite public institution. This feedback was incorporated into the final construct map (Figure 2.1). The survey for this study was a revised version of a pilot study (Fall 2021) based on instrument calibration and feedback from undergraduate students and doctoral candidates in higher education.

Response Process

Second, the validity of the response process was assessed by conducting two exit interviews with pilot study participants (Fall 2021). Based on the interviews, the evidence supports the item design. The first respondent stated,

"The survey made me feel like I was heard. For example, the sense of belonging question was intentional; I felt heard and seen. No one has asked me these questions about college satisfaction. Considering all my identities, I had to rethink some questions (campus fit, community, belonging, and navigating the transition process). I spent more time on those questions." - Respondent Sample A

In addition, a second respondent stated, “Awesome to hear about this. I think it’s important to understand the student’s perspective and make some good changes accordingly.” The first respondent also discussed how the construct map clearly outlines how students can be categorized based on their adjustment level.

Instrument Level

Third, the internal structure at the instrument level was investigated (Figure 2.9). The Spearman’s rho was .79 (rank-order correlation between hypothetical and empirical ranks of item difficulty, Figure 2.9). This correlation is inflated because the calibration forces the thresholds under a certain level. Ideally, we should not see much overlap between levels. However, based on Figure 2.9, the overlap is considerable. Different levels have similar thresholds; therefore, there are overlaps. The overlap can be due to fixed responses to the survey, which can be fixed by having open-ended questions.

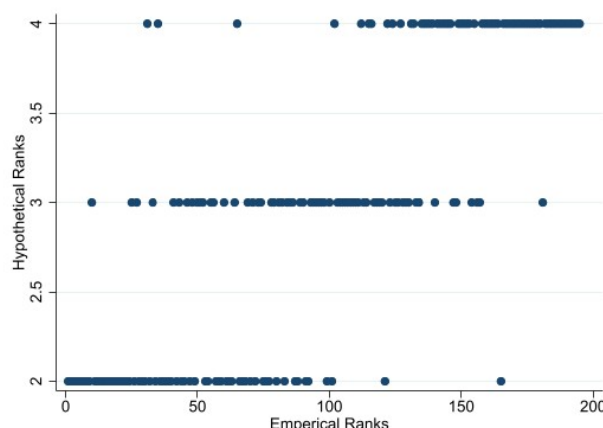


Figure 2.9: Graph of Correlation between Hypothetical and Empirical Ranks

Item Level

Fourth, the internal structure at the item level was investigated by examining how the mean estimate for the people who chose each score increased as the scores went up—the mean person ability estimates for the item level. The mean estimate is expected to increase as the score categories increase (see Table 2.3, marked with an asterisk). There were 13 items for which the estimates did not increase as the score categories increased. Table 2.3 shows each item with four rows corresponding to the four Likert options. Table 2.4 shows each item with the respondents’ rate. Overall, these questions asked students to rate their stress level after enrolling in the institution, if students visited resources on campus, if students are part of student organizations, the terminology used by academic advisors, and if they asked

professors for feedback on their homework. Below is an example, and explain why estimates for these questions did not increase.

Item 1_04 asked, “My level of stress increased when I started (name of school).” This question should be rephrased for future studies since it asks for “levels,” it can be challenging for students to quantify their stress levels before and after starting at the new school. The mean estimate for this score did not increase for the *Very Often* option. 46.86% (n = 82) of the students selected the *Very Often* category. This explains the decrease in the mean estimate.

Item 5_07 asked, “I visited Counseling and Psychological Services (CAPS).” While Item 5_08 asked, “I visited the Recreational Sports Facility (RSF).” These two questions need to be removed for future surveys. For Item 5_07, it can be challenging for some students to disclose that they use psychological services. Most students (68.57%, n = 120) selected the Never category for this item. This explains the decrease in the mean estimate.

Item 10_01 asked, “I either attend meetings, am an active member, and/or hold a leadership position(s) in a club, student organization, or student government group.” This question must be rephrased because it includes two ways students can get involved. Perhaps it wasn’t apparent for students to answer this question because of the and/or wording. Item 10_02 asked, “I either attend meetings, am an active member, and/or hold a leadership position(s) in a student cultural organization.” This item was also found to lay outside the desired range for the infit Mean Square (Figure 2.5). Item 10_03 asked, “I either attend meetings, am an active member, and/or hold a leadership position(s) in a faith-based organization.” This question did not differentiate between the two levels on the wright map (Figure 2.3).

Item 11_04 asked, “Upon starting, I felt alienated on campus.” This question asked students to think back to when they first started; perhaps students who had been at the university longer forgot their initial feelings of alienation versus those who had enrolled at the university not long ago. Item 11_05 asked, “Most undergraduates on campus feel like they do not “fit.” This question asks about how students perceive other students, not their own feelings. For future surveys, this question should be phrased with “I” to measure the student’s feeling of “fit” on campus.

Item 13_02 asked, “I did not understand the terminology used by academic advisors.” I aimed to target the hidden curriculum or academic jargon that students are unfamiliar with and can be confusing when meeting their academic advisors. This question needs to be rephrased to make it more straightforward for students. Item 14_05 asked, “I asked my professor for feedback on homework assignments.” For future surveys, these questions should include instructors or graduate student instructors to be more inclusive of those teaching. Most students (62.29%, n = 109) selected Never for this item. This explains the decrease in the mean estimate.

Item	Level	M WLE	Item	Level	M WLE
Item1_04	1	-0.11	Item10_02	1	-0.05
Item1_04	2	-0.02	Item10_02	2	0.02
Item1_04	3	0.2	Item10_02*	3	-0.05
Item1_04*	4	-0.12	Item10_02	4	0.03
Item3_02	1	-0.11	Item10_03	1	-0.02
Item3_02	2	0.01	Item10_03	2	-0.1
Item3_02*	3	-0.02	Item10_03	3	0.17
Item3_02	4	0.01	Item10_03*	4	0.04
Item3_03	1	-0.13	Item11_04	1	-0.14
Item3_03	2	0.03	Item11_04	2	-0.09
Item3_03	3	0.22	Item11_04	3	0.17
Item3_03*	4	-0.2	Item11_04*	4	0.04
Item3_04	1	-0.04	Item11_05	1	-0.06
Item3_04	2	-0.11	Item11_05	2	-0.08
Item3_04	3	0.01	Item11_05	3	0.07
Item3_04*	4	-0.01	Item11_05*	4	-0.05
Item5_07	1	-0.03	Item13_02	1	-0.19
Item5_07*	2	-0.07	Item13_02*	2	-0.21
Item5_07	3	-0.05	Item13_02	3	-0.1
Item5_07	4	0.3	Item13_02	4	0.03
Item5_08	1	-0.11	Item14_05	1	-0.12
Item5_08*	2	-0.11	Item14_05	2	0.08
Item5_08	3	0.12	Item14_05*	3	-0.04
Item5_08	4	0.18	Item14_05	4	0.74
Item10_01	1	-0.22			
Item10_01	2	0			
Item10_01*	3	-0.02			
Item10_01	4	0.19			

Table 2.3: Item Level Mean MLE

Item	n	Percent	Item	n	Percent
Item 1.04			Item 10.02		
Never	10	5.71	Never	88	50.29
Occasionally	36	20.57	Occasionally	36	20.57
Often	47	26.86	Often	23	13.14
Very Often	82	46.86	Very Often	28	16
Item 3.03			Item 10.03		
Agree Somewhat	68	38.86	Never	160	91.43
Agree Strongly	63	36	Occasionally	10	5.71
Disagree Somewhat	28	16	Often	3	1.71
Disagree Strongly	16	9.14	Very Often	2	1.14
Item 3.04			Item 11.05		
Agree Somewhat	38	21.71	Agree Somewhat	72	41.14
Agree Strongly	7	4	Agree Strongly	25	14.29
Disagree Somewhat	81	46.29	Disagree Somewhat	61	34.86
Disagree Strongly	49	28	Disagree Strongly	17	9.71
Item 5.07			Item 13.02		
Never	120	68.57	Never	109	62.29
Occasionally	34	19.43	Occasionally	57	32.57
Often	11	6.29	Often	8	4.57
Very Often	10	5.71	Very Often	1	0.57

Table 2.4: Response Rates for Items that Level Mean MLE Did not Increase

External Variable Validity

Fifth, external validity was established by examining the relationship between students' performance on the instrument and variables outside of the instrument. I chose three variables: the number of semesters a student has spent at their educational institution, academic year status, and race and ethnicity. I assume that the more semesters or academic status a student has, the higher the student's adjustment level will be. A correlation of -0.024 between the students' Student Adjustment Level estimates and the number of semesters spent at the institution shows a low correlation. Looking at Figure 2.10, we can see a line fitted to the data with a slight negative slope but with quite a lot of variation around the line. This is not a strong correlation, but it does support using the survey.

Examining the second external variable, academic years, a correlation of 0.008 was found between students' Student Adjustment Level and academic years. Indicating a weak relationship between students' adjustment levels and the academic years spent at the institution. I also examined the mean person's estimate for each academic year. On average, the WLE for the first year was 0.02 logits, the second year was -0.02 logits, the third year was -0.03 logits, the fourth year was 0.03 logits, and for the fifth year it was -0.01 logits (Figure 2.11).

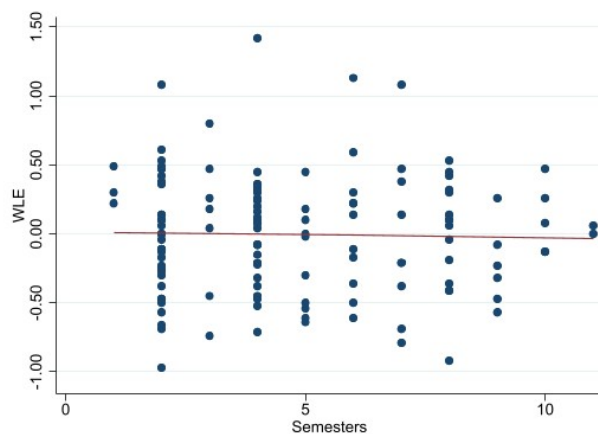


Figure 2.10: Graph of WLE and Semesters Spent at the University

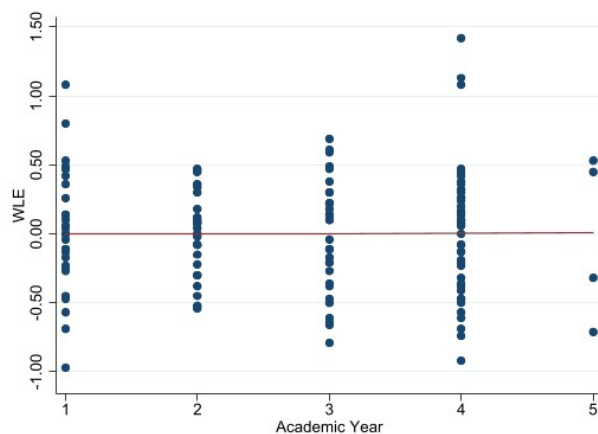


Figure 2.11: Graph of WLE and Academic Years at the Institution

Examining the third external variable, race and ethnicity, I examine the mean person's estimate for three race and ethnicity categories (Asian = 44, Latinx = 60, and White = 11). These race and ethnicity categories were the highest represented in the sample. On average, the WLE for the Asian students was 0.11 logits. For White students, it was 0.09; for Latinx students, it was -0.09 logits. I also created histograms for each race and ethnicity category to examine the distribution for each race and ethnicity and their person estimate (see Figures 2.12, 2.13, and 2.14). Figure 2.12, for Asian students, the mean person estimate histogram is normally distributed. The mean person estimate histogram for Asian students is normally distributed (Figure 2.12). This indicates that the adjustment mean person's

estimates for Asian students had a normal distribution. The mean person estimate histogram for White students is positively skewed (Figure 2.13), indicating that for White students, the mean person's estimates are distributed on the positive end of adjustment levels. The mean person estimates in the histogram for Latinx students are negatively skewed (Figure 2.14). For Latinx students, the adjustment mean person's estimates are more concentrated on the negative side.

These results are consistent with the literature on students' adjustment differences by race. For example, the work by Nora and Cabrera (1996) showed that during students' first year of college, students experiencing prejudice and discrimination negatively impact students' college adjustment for ethnically minoritized students in comparison to white students. Another body of literature explores the relationship between first-generation students and their relation to college adjustment (Duncheon, 2018; J. Llamas et al., 2020). A study by Santiago et al. (2019) showed that 44% of Latinx students are first-generation students, followed by White 34% and Asian (22%). This can contribute to the distribution of students' college adjustment (Figures 2.12, 2.13, and 2.14). In this study, Latinx students were the highest, being first-generation students ($n = 51$, 85%), followed by Asian ($n = 22$, 50%) and White ($n = 3$, 27%) students.

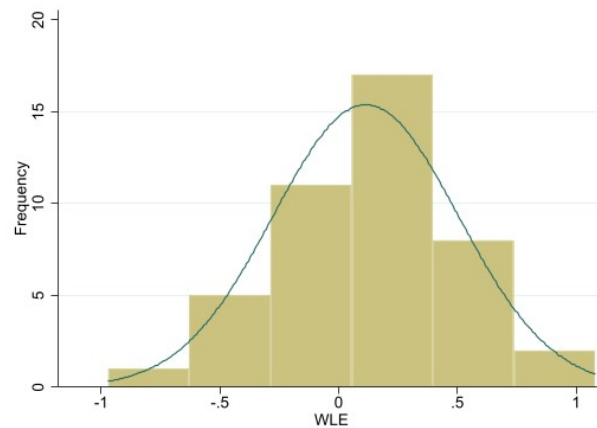


Figure 2.12: Histogram of WLE and Asian Students

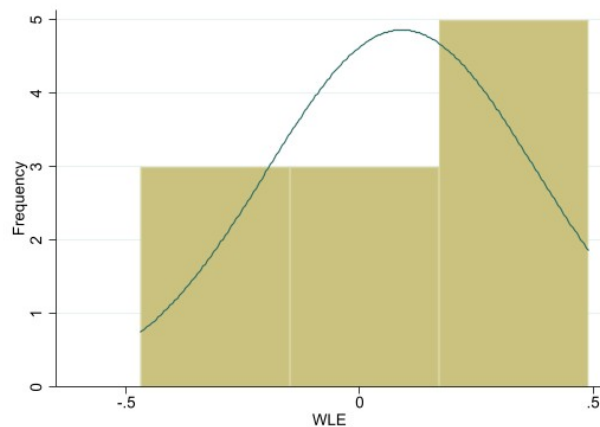


Figure 2.13: Histogram of WLE and White Students

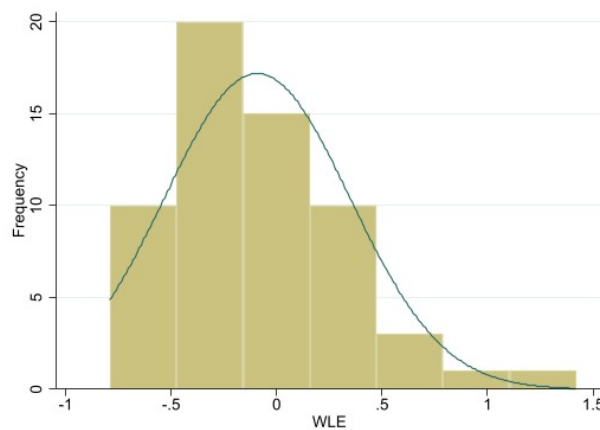


Figure 2.14: Histogram of WLE and Latinx Students

Consequence Validity

The consequence validity investigates the possible positive and negative outcomes of using the instrument. The positive consequence of this instrument is that the institution can conduct additional research to help identify the development of targeted resources that could improve students' adjustment levels. Since both the reliability and validity were established for this instrument, the result from this study could be used to develop targeted programming by the university administrators to enhance the student's adjustment levels and benefit student retention and graduation. The institution can also use the level of adjustments by providing targeting programming to populations that struggle to adjust to campus. A negative consequence can be that the instrument is missing other ways in which students' adjustment change while at the institution and does not truly represent their overall adjustment level. For example, I didn't include external factors (e.g., family support, financial support from scholarships) that help students adjust to college. This can impact how underrepresented communities adjust to campus without considering other external variables.

In addition, other items were not included in the calibration of this instrument. For example, items that were specific for students with disabilities and students who are parents were not included, namely "If you self-identify as a student with a disability, how often do you use the resources from the Disabled Student's Program (DSP)?" and "If you self-identify as a student parent, how often do you use the resources the Student Parent Center offers?". These two questions were only for students who self-identify as a student with a disability or as a student parent. Not including these items leaves out other identities students hold. However, if these items were included, they would not apply to students without a disability and non-parents, making scoring challenging.

Fairness

First-Generation and Non-First-Generation Students. Lastly, I examine fairness using differential item functioning (DIF) by first-generation status and transfer students. Fairness was done by accounting for DIF by first-generation status. Two separate calibrations were conducted for first-generation ($n = 86$) and non-first-generation ($n = 50$). Since the sample size for non-first-generation students was smaller than the original sample size while running the calibration, four Items, 5_07, 10_03, 13_02, and 13_04, did not have all possible scores selected as answers. For example, in Item 5_07, "I visited Counseling and Psychological Services (CAPS)." Students did not choose the option *Very Often*. This created an error in the calibration. A down coding of the scores was used as an alternative to calibrating those scores. EISS automatically recodes to skip null categories. As such, for example, for Item 5_07 and Item 10_03, option *Never* would receive a score of 0 (campus alienation), *Occasionally* would receive a score of 1 (uncomfortable), *Often* would receive a score of 2 (comfortable), and *Very Often* would receive a score of 3 (campus identity). After the down coding, the new scores for the Very Often option were down-scored to 2 (comfortable). All other scores were kept the same.

Overall, first-generation and non-first-generation item difficulty estimates had a high correlation level of 0.82. Figure 2.15 shows first-generation versus non-first-generation overall item difficulty. The points further away from the trendline indicate items that differed considerably in difficulty between first-generation and non-first-generation students (Figure 2.15). Eleven items appeared further away from the trendline (shown in red). For example, Item 3_01 was identified to differ in difficulty by generation status. It asked students to rate, “I feel like I belong academically at (name of university).” Second, Item 5_01 was also another item that differed considerably. This item asked students to rank “I utilized the services and resources offered on campus.” In addition, Item 5_04 also differed considerably. This question asked students to rate “I visited (name of university) libraries.”

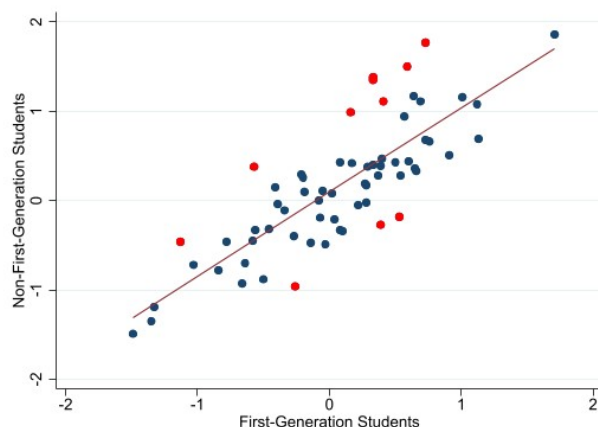


Figure 2.15: Overall Item Difficulty for Non-First-Generation versus First-Generation Students

I further investigated the step difficulty and step standard error for each item, which differed considerably in difficulty between first-generation and non-first-generation. Using the step difficulty and step standard, I calculated the 95% confidence interval for the step difficulty to analyze if the confidence interval overlaps. I used the effect size Longford et al. (1993) recommended to identify statistically significant items. Further, I used the Rasch item response function models described by Paek (n.d.) to determine the DIF effect size from 1-negligible (values less than .426), 2-intermediate (values between .426 and .638), and 3-large (values over .638) (see Table 2.5).

Overall, the DIF effect sizes of four items were considered large. Statistically, these items differ significantly in step difficulty between first-generation and non-first-generation students. For example, Item 3_02 asked students to rate “The large classes intimidate me.” Future surveys should consider not including these four items.

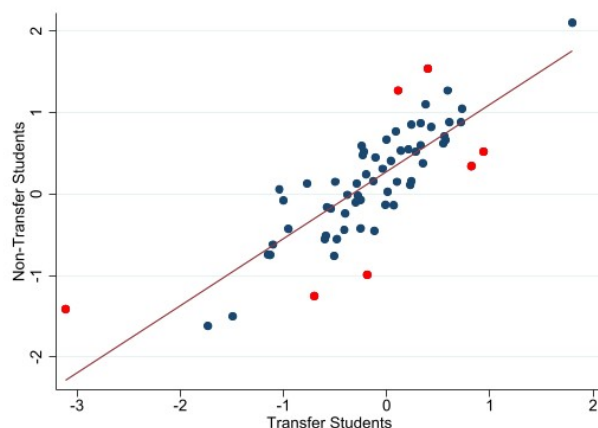


Figure 2.16: Overall Item Difficulty for Non-Transfer versus Transfer Students

Transfer and Non-Transfer Students DIF. A second fairness test was conducted by accounting for DIF by transfer status. Two separate calibrations were performed for transfer ($n = 37$) and non-transfer students ($n = 99$). Since the sample size for transfer students was smaller, while running the calibration, four Items, 10_03, 13_02, 13_03, and 13_04, did not have all scores selected as possible answers. A down coding of the scores was used as an alternative to calibrating those scores. For non-transfer students, only Item 10_03, a down coding of the scores, was used as an alternative to calibrating those scores. For example, Item 10_03 asked students to rate “I either attend meetings, am an active member, and/or hold a leadership position(s) in a faith-based organization.” For this item, a down score option was used as an alternative to the calibration because students did not select the option Very Often.

Overall, transfer and non-transfer students had a high correlation level of 0.82. Figure 2.16 shows the overall difficulty between transfer and non-transfer students. The points further away from the trendline indicate items that differed considerably in difficulty between transfer and non-transfer students. In total, six items appeared further away from the trendline. For example, Item 13_03 was identified to differ in difficulty by transfer status. It asked students to rate “I did not like my academic advisor.” For transfer students, only the options Never and Very Often were selected for this item.

I used the DIF effect size to examine whether the difference was statistically significant for transfer and non-transfer students (Table 2.6). After calculating the DIF effect size, three items whose DIF effect size was considered large. These items statistically significantly differ in difficulty for transfer and non-transfer students to answer. In addition, in Items 4_02 and 13_03, the DIF effect size could not be calculated because these items had missing thresholds that could not be scored. Items 3_04, 4_02, and 10_02 for future surveys must be reconsidered, mainly if the sample includes transfer and non-transfer students.

First-Generation				Non-First Generation			
				95% CI			
Item	Threshold	Std. Err.	Upper	Lower	Upper	Lower	Upper
Item 3_01	Please indicate the extent to which you agree or disagree with the following statements.						
	<i>I feel like I belong academically at (name of institution).</i>						
1	-1.33	0.4	-2.13	-0.53	-1.97	1.02	0.07
2	-1	0.24	-1.48	-0.52	-1.42	0.42	-0.58
3	1.54	0.33	0.88	2.2	0.5	0.3	1.1
Item 3_02	<i>The large classes intimidate me.</i>						
1	-0.79	0.26	-1.31	-0.27	-1.31	0.45	-0.41
2	0.3	0.24	-0.18	0.78	0.95	0.3	1.55
3	2.07	0.52	1.03	3.11	-0.18	0.33	0.48
Please rate how familiar you are with the following offices on campus:							
Item 4_01	<i>The financial aid office.</i>						
1	-0.43	0.26	-0.95	0.09	0.47	0.29	-0.11
2	-0.26	0.23	-0.72	0.2	1.55	0.45	2.45
3	1.67	0.41	0.85	2.49	2.04	1.02	4.08
Item 4_05	<i>The Counseling and Psychological Services (CAPS).</i>						
1	0.35	0.23	-0.11	0.81	0.33	0.29	-0.25
2	0.31	0.25	-0.19	0.81	2.16	0.49	3.14
3	0.57	0.34	-0.11	1.25	0.83	0.74	2.31

Table 2.5: Item Difficulty for First Generation and Non-First Generation Students

Please rate the following statements based on your experience at (name of institution):												
<i>I utilized the services and resources offered on campus.</i>												
Item 5_01												
1	-2.94	0.59	-4.12	-1.76	-1.9	0.53	-2.96	-0.84	-1.04	1		
2	0.43	0.23	-0.03	0.89	0.52	0.3	-0.08	1.12	-0.09	1		
3	0.8	0.31	0.18	1.42	2.51	0.73	1.05	3.97	-1.71	1		
Item 5_03	<i>I visited the financial aid office.</i>											
1	-0.09	0.23	-0.55	0.37	1.14	0.32	0.5	1.78	-1.23	1		
2	1.36	0.3	0.76	1.96	2.88	0.74	1.4	4.36	-1.52	1		
3	0.51	0.42	-0.33	1.35	0.48	1.03	-1.58	2.54	0.03	1		
Item 5_04	<i>I visited (name of institution) libraries.</i>											
1	-2.77	0.72	-4.21	-1.33	-1.13	0.54	-2.21	-0.05	-1.64	1		
2	-0.31	0.25	-0.81	0.19	-0.39	0.32	-1.03	0.25	0.08	1		
3	-0.31	0.23	-0.77	0.15	0.15	0.31	-0.47	0.77	-0.46	1		
Item 5_06	<i>I visited the (health) center.</i>											
1	-0.23	0.24	-0.71	0.25	0.67	0.29	0.09	1.25	-0.9	1		
2	0.4	0.24	-0.08	0.88	1.44	0.45	0.54	2.34	-1.04	1		
3	0.82	0.35	0.12	1.52	2.04	1.02	0	4.08	-1.22	1		
Please rate the following statements based on your experience at (name of institution):												
<i>I either attend meetings, am an active member, and/or hold a leadership position(s) in a student cultural organization.</i>												
Item 10_02												
1	0.28	0.24	-0.2	0.76	1.56	0.32	0.92	2.2	-1.28	1		
2	0.51	0.25	0.01	1.01	0.97	0.41	0.15	1.79	-0.46	1		
3	-0.32	0.28	-0.88	0.24	0.42	0.54	-0.66	1.5	-0.74	1		
Item 11_04	Please indicate the extent to which you agree or disagree with the following statements based on your experiences at (name of institution).											
	<i>Upon starting, I felt alienated on campus.</i>											
1	-0.08	0.23	-0.54	0.38	-1	0.45	-1.9	-0.1	0.92	3		
2	0.65	0.25	0.15	1.15	0.3	0.3	-0.3	0.9	0.35	1		
3	0.6	0.36	-0.12	1.32	-0.11	0.31	-0.73	0.51	0.71	3		

Transfer		Non-Transfer								
		95% CI				95% CI				
Item	Threshold	Std. Err	Lower	Upper	Threshold	Std. Err	Lower	Upper	Logit Diff.	Effect Size
Please indicate the extent to which you agree or disagree with the following statements.										
Item 3_04	<i>Because I was a new student, my peers and faculty underestimated my academic abilities.</i>									
1	-1.16	0.54	-2.24	-0.08	-2.42	0.72	-3.86	-0.98	1.26	3
2	-1	0.36	-1.72	-0.28	-1.06	0.26	-1.58	-0.54	0.06	1
3	1.58	0.54	0.5	2.66	0.52	0.22	0.08	0.96	1.06	3
Please rate how familiar you are with the following offices on campus:										
Item 4_02	<i>The (name of institution) library system</i>									
1	-1.48	0.62	-2.72	-0.24	-3.4	1.01	-5.42	-1.38	1.92	3
2	-0.61	0.37	-1.35	0.13	-0.59	0.24	-1.07	-0.11	-0.02	1
3	0.37	0.37	0.25	0.49	0.25	0.22	-0.19	0.69	NA	NA
Please rate the following statements based on your experience at (name of institution):										
Item 10_02	<i>I either attend meetings, am an active member, and/or hold a leadership position(s) in a student cultural organization.</i>									
1	0.56	0.35	-0.14	1.26	0.92	0.22	0.48	1.36	-0.36	1
2	2.37	0.64	1.09	3.65	0.2	0.23	-0.26	0.66	2.17	3
3	-0.47	0.78	-2.03	1.09	-0.11	0.26	-0.63	0.41	-0.36	1
Please rate the following statements based on your experience at (name of institution):										
Item 13_03	<i>I did not like my academic advisor.</i>									
1	-3.11	0.73	-4.57	-1.65	-1.02	0.72	-2.46	0.42	-2.09	1
2					-1.19	0.43	-2.05	-0.33		NA
3					-2.03	0.27	-2.57	-1.49		NA
How often did you partake in the following activities at (name of institution) during this academic year (2022-2023)?										
Item 14_02	<i>I asked my instructor for additional academic support related to their course.</i>									
1	-0.27	0.37	-1.01	0.47	0.39	0.21	-0.03	0.81	-0.66	1
2	0.41	0.37	-0.33	1.15	1.68	0.34	1	2.36	-1.27	1
3	0.19	0.47	-0.75	1.13	1.75	0.73	0.29	3.21	-1.56	1
Item 14_05	<i>I asked my professor for feedback on homework assignments.</i>									
1	0.3	0.35	-0.4	1	0.56	0.21	0.14	0.98	-0.26	1
2	0.42	0.39	-0.36	1.2	1.61	0.36	0.89	2.33	-1.19	1
3	0.5	0.56	-0.62	1.62	2.45	1.01	0.43	4.47	-1.95	1

Table 2.6: Item Difficulty for Transfer and Non-Transfer

2.7 Discussion

The college experience is complex, comprising multiple ecosystems from the classroom to the campus-wide level. These experiences can vary across students because of their intersectional identities and the institutions students attend. In addition, for transfer students, once they transfer, their experience can differ from that of students who enrolled right after graduating from high school. This paper developed and validated a new instrument that examines students' college adjustment while incorporating five critical components to students' college experience: academic belonging, community, student agency, faculty and major advisor support, and equity. In addition, this study looks at the number of semesters a student spends at the university, the difference in adjustment level by race and ethnicity, and examines how the instrument functions for transfer and non-transfer students and first-generation and non-first-generation students.

Overall, the findings of this paper showed good internal validity ($WLE = 0.881$) and alternate forms of reliability with a subset of the survey (Form A $WLE = 0.779$, Form B $WLE = 0.764$). Although I hypothesize that students in their later years at the institution will tend to have higher adjustment levels, the external validity assessment of the instrument showed that students' mean adjustment levels do not follow this pattern. Fourth-year students have a higher mean person estimate than first, second, third, and fifth-year students. When examining students' race and ethnicity, Asian students have a higher mean person estimate, followed by White students and Latinx students. Lastly, when examining differential item functioning for first-generation and non-first-generation students, a few items differed considerably in step difficulty by generation status. This was the same for transfer and non-transfer students. Some items act differently in step difficulty depending on the transfer status of the students.

Bridging previous research, this paper contributes to the literature by incorporating important factors into one instrument to measure students' adjustment levels. The first intriguing finding was that students in their fourth year had higher mean person estimates than first through third and fifth-year students. One explanation for the difference in college adjustment levels between first- and fourth-year students is that students in their first year of college are learning how to use their skills for the university academic demands versus fourth-year students who have already developed those skills from previous years. For example, the work by Cook and Leckey (1999) showed that first-year students often do not have the self-regulatory skills necessary to keep up with the demands of the university environment. This is due to students not being used to not having a structure or supervision in comparison to their secondary school experience (Cook & Leckey, 1999).

A contribution of the study to the literature is examining students' college adjustment levels across different academic years. Traditionally, the literature focuses on first-year college adjustment (Baker & Siryk, 1984; Lubker & Etzel, 2007; Swenson et al., 2008). Studies that have used a longitudinal approach in studying student college adjustment include the work of Rice (1992), who examined the change in parent individuation from freshman to junior year. Rice's results showed an increase in parent individuation over time. This change had gender

patterns in individuation and college adjustment. Future studies can examine students' interactions with different identities to see if there are changes in college adjustment across time and if there are distinct patterns by gender, first-generation, socioeconomic status, etc.

A second interesting finding of this study was that Latinx students participating in the study had lower mean person estimates than their Asian and White peers. Research on Latinx students' transition to college and college adjustment level has found that dimensions of campus climate affect all forms of student adjustment (Hurtado & Carter, 1997). In addition, a meta-analysis by Quintana et al. (1991) examining 16 studies on the type of stress of Latinx and White students stressors, including academic, financial, personal, and social isolation, showed that Latinx students experienced a significantly greater amount of stress than their White peers. This research is consistent with the literature on Latinx students' adjustment levels. Future studies must examine Latinx students' adjustment levels and how they depend on other students' characteristics and backgrounds, such as first-generation and transfer status. As found in this study, some items acted differently for first-generation and transfer students. Particularly for institutions who are working towards becoming a Hispanic Serving Institution (HSI), this study suggests that institutions can develop to improve Latinx adjustment experience through programming around the five dimensions explored in this study to promote Latinx academic belonging, student agency, community, faculty and academic advisor support, and equity which can impact student persistence, retention, and ultimately degree attainment.

2.8 Limitations and Future Research

A limitation of this study is that findings cannot be generalized to describe other public elite institutions, given differences in populations. On the other hand, this research contributes to the literature by providing a new instrument that can be used to analyze how students adjust at other public elite universities. The next step of this study would be to remove items in the survey that functioned differently depending on first-generation and transfer status. As well as changing the format of the items that overlap as part of the internal structure at the instrument level. These fixed items can be changed to open-ended questions. Additional research should be conducted on Latinx students to see how their adjustment levels are associated with other intersecting identities.

2.9 Appendix

Survey A1. Undergraduate Student College Transition and Adjustment Survey

Academic Belonging

1. How often did you experience the following after you started attending (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I did not know how to get around campus.
 - b) I did not know the class requirements for my major.
 - c) I did not know any other students.
 - d) My level of stress has increased since I started attending (name of university).
2. During the current academic year (2022-2023), how often did you participate in each of the following? (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I took detailed notes in class.
 - b) I participated in class discussions.
 - c) I thought about practical applications of the class material to real-life problems.
 - d) I worked on a paper or project where I integrated ideas from various sources.
 - e) I explained content material to a fellow peer.
3. Based on your experiences during the current academic year at (name of university) (2022-2023), please indicate how much you agree or disagree with the following statements. (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly)
 - a) I feel like I belong academically at (name of university).
 - b) Large class sizes intimidate me.
 - c) There is a sense of competition among undergraduates at (name of university) not found at other universities.
 - d) Because I was a new student, my peers and faculty underestimated my academic abilities.

Student Agency

4. Please rate how familiar you are with the following offices on campus: (Scale: 0-Not Familiar, 1-Somewhat Familiar, 2-Familiar, 3-Very Familiar)
 - a) The financial aid office
 - b) The (name of university)y library system
 - c) The Student Learning Center
 - d) The Tang Center
 - e) The Counseling and Psychological Services (CAPS)
 - f) The Recreational Sports Facility (RSF)
 - g) Disabled Student's Program (DSP)
 - h) The Cal Veteran Service Center
 - i) The Student Parent Center
 - j) The Equal Opportunity Program (EOP) office
 - k) The Transfer Student Center
 - l) The Undocumented Student Program
 - m) (Name of university) Underground Scholars
5. Please rate the following statements based on your experiences at (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I utilized the services and resources offered on campus.
 - b) I feel like I have the agency to seek help when needed.
 - c) I visited the financial aid office.
 - d) I visited (name of university) libraries.
 - e) I visited the Student Learning Center.
 - f) I visited the Tag center.
 - g) I visited Counseling and Psychological Services (CAPS).
 - h) I visited the Recreational Sports Facility (RSF).
6. If you self-identify as a student with a disability, how often do you use the resources from the Disabled Student's Program (DSP)?"
 - a) No, I am not a student with a disability.
 - b) Never

- c) Occasionally
 - d) Often
 - e) Very Often
 - f) I prefer not to answer
7. If you self-identify as a Veteran student, how often do you use the resources the Veteran Service Center offers?
- a) No, I am not a student Veteran.
 - b) Never
 - c) Occasionally
 - d) Often
 - e) Very Often
 - f) I prefer not to answer
8. If you self-identify as a student parent, how often do you use the resources the Student Parent Center offers?
- a) No, I am not a student parent.
 - b) Never
 - c) Occasionally
 - d) Often
 - e) Very Often
 - f) I prefer not to answer
9. If you self-identify as a transfer student, how often do you use the resources the Transfer Student Center offers?
- a) No, I am not a transfer student.
 - b) Never
 - c) Occasionally
 - d) Often
 - e) Very Often
 - f) I prefer not to answer

Community

10. Please rate the following statements based on your experiences at (name of university) (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I either attend meetings, am an active member, and/or hold a leadership position(s) in a club, student organization, or student government group.
 - b) I either attend meetings, am an active member, and/or hold a leadership position(s) in a student cultural organization.
 - c) I either attend meetings, am an active member, and/or hold a leadership position(s) in a faith-based organization.
 - d) I meet up and/or hang out with friends from (name of university).
 - e) I feel or have felt isolated on campus.
 - f) I feel or have felt that I do not fit in with other students.
11. Please indicate the extent to which you agree or disagree with the following statements based on your experiences at (name of university). (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly).
- a) I feel like I am part of and have a community on campus.
 - b) I feel like adjusting to the social environment at (name of university) has been easy.
 - c) It is easy to make friends on campus.
 - d) Upon starting, I felt alienated on campus.
 - e) Most undergraduates on campus feel like they do not "fit."

Faculty and Academic Advisor Support

12. Please rate the following statements based on your experiences at (name of university) (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I feel comfortable talking to professors outside of class (e.g., going to office hours).
 - b) I feel comfortable asking my instructor about any information related to the course (e.g., grades, asking for extensions on assignments, etc.).
 - c) I feel accepted by professors.
 - d) Professors are invested in the academic development of undergraduates.
 - e) I met with an academic advisor.
 - f) I feel accepted by my academic advisor.

13. Please rate the following statements based on your experiences at (name of university):
(Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I did not understand the terminology used by the faculty.
 - b) I did not understand the terminology used by academic advisors.
 - c) I did not like my academic advisor.
 - d) I did not trust my academic advisor.
14. How often did you partake in the following activities at (name of university) during this academic year (2022-2023)? (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I visited faculty during office hours and sought their support on class assignments.
 - b) I asked my instructor for additional academic support related to their course.
 - c) I discussed my career plans and goals with a faculty member.
 - d) I discussed my career plans and goals with a career advisor.
 - e) asked my professor for feedback on homework assignments.

Equity

15. (Name of university) adequately addresses issues related to (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly)
- a) Xenophobia
 - b) Racism
 - c) Institutional whiteness
 - d) Gender and/or Sexual identity
 - e) Socio-economic level or classism
 - f) Language barriers
 - g) First-generation student needs
 - h) Transfer student needs
 - i) Undocumented student needs
 - j) International student needs
16. Please rate the following statements (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly, 4-Does not apply)
- a) I can easily access any resources and/or support services on campus.

- b) (Name of university) offers equal access to resources and/or support services to all students regardless of race/ethnicity, gender, or socio-economic status.
- c) As a first-generation student, I face institutional barriers limiting my ability to succeed.
- d) As a first-generation student, (name of university) provides me with the resources and/or support programs I need to navigate higher education.
- e) As a student with a disability, I face institutional barriers limiting my ability to succeed.
- f) As a student with a disability, (name of university) provides me with the resources and/or support programs I need to navigate higher education.
- g) As a transfer student, I face institutional barriers limiting my ability to succeed.
- h) As a transfer student, (name of university) provides me with the resources and/or support programs I need to navigate higher education.

Navigating the Transition Process

(Open-ended)

- 17. Please describe your overall transition experience and the challenges you faced while starting at (name of university). What helped you adjust to (name of university)?
- 18. Thinking back on your transition from high school to (name of university), is there anything your high school could have provided to make that process easier?
- 19. If you are a transfer student, consider your transition from community college to (name of university). Is there anything your community college could have provided to make that process easier?
- 20. What support services and resources within or outside (name of university) helped you navigate the transition process?
- 21. Can you describe what community at (name of university) means and feels for you:

College Satisfaction

This section aims to obtain information about your college satisfaction at (name of university).

- 22. Please rate your satisfaction with the following statements based on your experiences at (name of university): (Scale: 0-Not at all Satisfied, 1-Dissatisfied, 2-Satisfied, 3-Very Satisfied).
 - a) The courses I have taken on campus have enriched my perspectives.

- b) The campus community is an intellectually stimulating place to be.
- c) Sense of belonging in classes at (name of university).
- d) Sense of community on campus.
- e) Sense of being able to advocate for yourself.
- f) Student services address students' needs.
- g) Academic advising.
- h) Student housing.
- i) Food security.
- j) Financial aid services.
- k) Positive interactions with faculty.
- l) Positive interactions contact with Graduate Teaching Instructors (GSI).
- m) Positive interactions with other students.
- n) The ethnic and racial diversity of the faculty.
- o) The ethnic and racial diversity of the administration and staff.

Demographic Information

23. What is your current age?

24. Gender

- a) Female
- b) Male
- c) Transgender
- d) Non-binary/non-conforming
- e) Prefer not to answer
- f) Other

25. Which of the following do you identify with?

- a) Asian
- b) Black or African American
- c) Hispanic/Latina(o)(e)(x)
- d) Indigenous/Native/American Indian
- e) Middle Eastern or North African (MENA)

- f) Native Hawaiian or Pacific Islander
 - g) White or Caucasian (non-Hispanic)
 - h) Some Other Race, please specify:
 - i) Prefer not to answer
26. What is your best estimate of your parent's household income last year?
- a) Less than \$20,000
 - b) \$20,000 to \$39,999
 - c) \$40,000 to \$59,999
 - d) \$60,000 to \$79,999
 - e) \$80,000 to \$149,999
 - f) \$150,000 to 199,999
 - g) \$200,000 or more
27. Are you a first-generation college student (the first in your family to attend college)?
- a) Yes
 - b) No
 - c) Do not know
28. Do you identify as a student with a disability?"
- a) Yes
 - b) No
29. Do you identify as a Veteran student?
- a) Yes
 - b) No
30. Do you identify as a student parent? (e.g., a student who has dependents)
- a) Yes
 - b) No
31. Are you a transfer student?
- a) Yes
 - b) No

32. If you answer YES, to question 31, where did you transfer from?
- a) Community college
 - b) Another university
33. If you answered YES, to question 31, please list the last term/semester and year you attended community college. (Open-ended)
34. If you answered YES, to question 31, please list the semester and year you transferred to (name of university): (Open-ended)
35. If you answer NO, to question 31, please list the semester and year you started at (name of university): (Open-ended)
36. How many semesters have you completed at (name of university)? Note: this also includes summer semesters and the current semester Spring of 2023. (e.g., If you started attending (name of university) in **Fall 2022**, you will list **2** [fall 2022 and spring 2023]) (Open-ended)
37. What is your declared major? **Note:** If you are a double major, please list both majors. (Open-ended)
38. Since attending (name of university), have you changed majors?
- a) Yes
 - b) No, and I do not plan to change majors
 - c) No, but I plan to change majors
39. If you answer yes, to question 38, please list your previous major: (Open-ended)
40. If you changed majors, why did you change your major? (Open-ended)
41. What year in your undergraduate program are you?
- a) First year
 - b) Second year
 - c) Third year
 - d) Fourth year
 - e) Fifth year
 - f) Sixth year
 - g) Seventh or higher
42. How many credits/units have you completed so far at (name of university)? (Including spring 2023)(Open-ended)

43. What is your current (name of university) grade point average (GPA)
- a) 3.50 to 4.0
 - b) 3.0 to 3.49
 - c) 2.50 to 2.99
 - d) 2 to 2.49
 - e) Less than 1.99
44. What was your high school grade point average (GPA)?
- a) 3.50 to 4.0
 - b) 3.0 to 3.49
 - c) 2.50 to 2.99
 - d) 2 to 2.49
 - e) Less than 1.99
45. What was your transfer grade point average (GPA) as a transfer student?
- a) 3.50 to 4.0
 - b) 3.0 to 3.49
 - c) 2.50 to 2.99
 - d) 2 to 2.49
 - e) Less than 1.99
46. On average, how many hours per week do you work in exchange for paid wages?
- a) 0, I don't have a job
 - b) 1 to 10 hours
 - c) 11 to 15 hours
 - d) 16 to 20 hours
 - e) 21 to 30 hours
 - f) 31 to 40 hours
 - g) More than 40 hours

Survey B1. Undergraduate Student College Transition and Adjustment Survey (Form A)

Academic Belonging

1. How often did you experience the following after you started attending (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I did not know how to get around campus.
 - b) I did not know any other students.
2. During the current academic year (2022-2023), how often did you participate in each of the following? (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I took detailed notes in class.
 - b) I thought about practical applications of the class material to real-life problems.
 - c) I explained content material to a fellow peer.
3. Based on your experiences during the current academic year at (name of university) (2022-2023), please indicate how much you agree or disagree with the following statements. (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly)
 - a) I feel like I belong academically at (name of university).
 - b) Large class sizes intimidate me.

Student Agency

4. Please rate how familiar you are with the following offices on campus: (Scale: 0-Not Familiar, 1-Somewhat Familiar, 2-Familiar, 3-Very Familiar)
 - a) The financial aid office
 - b) The Student Learning Center
 - c) The Counseling and Psychological Services (CAPS)
5. Please rate the following statements based on your experiences at (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I utilized the services and resources offered on campus.
 - b) I visited (name of university) libraries.
 - c) I visited the Tag center.
 - d) I visited the Recreational Sports Facility (RSF).

Community

6. Please rate the following statements based on your experiences at (name of university) (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I either attend meetings, am an active member, and/or hold a leadership position(s) in a club, student organization, or student government group.
 - b) I either attend meetings, am an active member, and/or hold a leadership position(s) in a faith-based organization.
 - c) I feel or have felt isolated on campus.
 - d) I feel or have felt that I do not fit in with other students.
7. Please indicate the extent to which you agree or disagree with the following statements based on your experiences at (name of university). (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly).
- a) It is easy to make friends on campus.

Faculty and Academic Advisor Support

8. Please rate the following statements based on your experiences at (name of university) (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I feel comfortable talking to professors outside of class (e.g., going to office hours).
 - b) I feel accepted by professors.
 - c) I met with an academic advisor.
9. Please rate the following statements based on your experiences at (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I did not understand the terminology used by the faculty.
 - b) I did not trust my academic advisor.
10. How often did you partake in the following activities at (name of university) during this academic year (2022-2023)? (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
- a) I asked my instructor for additional academic support related to their course.
 - b) I discussed my career plans and goals with a faculty member.

Equity

11. (Name of university) adequately addresses issues related to (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly)
 - a) Xenophobia
 - b) Institutional whiteness
 - c) Socio-economic level or classism
 - d) First-generation student needs
 - e) Undocumented student needs
12. Please rate the following statements (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly, 4-Does not apply)
 - a) I can easily access any resources and/or support services on campus.

Survey C1. Undergraduate Student College Transition and Adjustment Survey (Form B)

Academic Belonging

1. How often did you experience the following after you started attending (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I did not know the class requirements for my major.
 - b) My level of stress has increased since I started attending (name of university).
2. During the current academic year (2022-2023), how often did you participate in each of the following? (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I participated in class discussions.
 - b) I worked on a paper or project where I integrated ideas from various sources.
3. Based on your experiences during the current academic year at (name of university) (2022-2023), please indicate how much you agree or disagree with the following statements. (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly)
 - a) There is a sense of competition among undergraduates at (name of university) not found at other universities.
 - b) Because I was a new student, my peers and faculty underestimated my academic abilities.

Student Agency

4. Please rate how familiar you are with the following offices on campus: (Scale: 0-Not Familiar, 1-Somewhat Familiar, 2-Familiar, 3-Very Familiar)
 - a) The (name of university) library system
 - b) The Tang Center
 - c) The Recreational Sports Facility (RSF)
5. Please rate the following statements based on your experiences at (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I feel like I have the agency to seek help when needed.
 - b) I visited the financial aid office.
 - c) I visited the Student Learning Center.
 - d) I visited Counseling and Psychological Services (CAPS).

Community

6. Please rate the following statements based on your experiences at (name of university) (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I either attend meetings, am an active member, and/or hold a leadership position(s) in a student cultural organization.
 - b) I meet up and/or hang out with friends from (name of university).
7. Please indicate the extent to which you agree or disagree with the following statements based on your experiences at (name of university). (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly).
 - a) I feel like I am part of and have a community on campus.
 - b) I feel like adjusting to the social environment at (name of university) has been easy.
 - c) It is easy to make friends on campus.
 - d) Upon starting, I felt alienated on campus.
 - e) Most undergraduates on campus feel like they do not "fit."

Faculty and Academic Advisor Support

8. Please rate the following statements based on your experiences at (name of university) (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I feel comfortable asking my instructor about any information related to the course (e.g., grades, asking for extensions on assignments, etc.).
 - b) Professors are invested in the academic development of undergraduates.
 - c) I feel accepted by my academic advisor.
9. Please rate the following statements based on your experiences at (name of university): (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I did not understand the terminology used by academic advisors.
 - b) I did not like my academic advisor.
10. How often did you partake in the following activities at (name of university) during this academic year (2022-2023)? (Scale: 0-Never, 1-Occasionally, 2-Often, 3-Very Often)
 - a) I visited faculty during office hours and sought their support on class assignments.
 - b) I discussed my career plans and goals with a career advisor.
 - c) asked my professor for feedback on homework assignments.

Equity

11. (Name of university) adequately addresses issues related to (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly)
 - a) Racism
 - b) Gender and/or Sexual identity
 - c) Language barriers
 - d) Transfer student needs
 - e) International student needs
12. Please rate the following statements (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly, 4-Does not apply)
 - a) (Name of university) offers equal access to resources and/or support services to all students

Study 3

College Adjustment and Satisfaction for Latinx Transfer Students at an Elite Public Institution: A comparison to their non-transfer Latinx peers

3.1 Abstract

The number of Latinx students in U.S. colleges is increasing, with community colleges serving as pivotal gateways to higher education for Latinx students. Upon enrollment, Latinx students' experiences of adjustment and satisfaction often vary from those of their White counterparts. This paper examined Latinx college satisfaction and adjustment to increase and facilitate Latinx students' retention and degree attainment. College satisfaction is conceptualized and operationalized using a multidimensional approach incorporating three components: academic and community satisfaction, student well-being and resources satisfaction, and ethnoracial diversity satisfaction. These components consider students' assessments of their institution's academic experiences, opportunities to develop community, and other indicators of student well-being. This study used survey data to examine college adjustment and satisfaction for Latinx transfer students compared to their non-transfer Latinx peers attending an elite public institution. Using multiple linear regression analysis, results showed that two components of college satisfaction (academic, community, and student well-being) were positively associated with students' college adjustment. In addition, defining overall college satisfaction as the average of all three components, first-generation students had lower mean college satisfaction than their non-first-generation peers. This study advances the literature by providing new multidimensional tools for studying Latinx transfer and non-transfer students' college experiences attending an elite public institution.

Keywords: college transition, Latinx students' college adjustment, college satisfaction, Latinx transfer students

3.2 Introduction

Higher education is a crucial pathway for upward social mobility for first-generation, low-income, and Latinx students (Teranishi et al., 2011). Yet, educational experience can vary substantially across different institutions (M. J. Mayhew, 2016). These experiences can also vary within institutions because of the various academic and community environments on college campuses and the other learning experiences across departments. When examining factors impacting undergraduate college retention, persistence, and outcomes, the literature often focuses on college adjustment and satisfaction (Cabrera et al., 1999; Kuh et al., 2005; Ostrove & Long, 2007; Pascarella et al., 2011). Ultimately, these two components are essential for students' degree attainment. This is especially true of Latinx students who increasingly enroll in college but maintain among the lowest rates of four-year degree completion of all ethnoracial groups (Santiago et al., 2019).

As we strive to make higher education more equitable, this study highlights how Latinx transfer students' adjustment and satisfaction are similar or different compared to non-transfer Latinx students at an elite public institution in California. This comparison will allow us to understand how Latinx transfer students adjust to college and their college satisfaction rating compared to their non-transfer peers. As a result, institutions can develop targeted programs to support transfer and non-transfer students in their undergraduate careers. In this study, I used survey data to obtain a complete picture of students' college experiences for Latinx transfer and non-transfer students, which is essential. In addition, I focus on the college experience, perceptions, and environment as crucial determinants affecting Latinx college persistence and outcomes.

California is home to over one-quarter of all Latinos living in the United States (Reddy & Siqueiros, 2021). Latinx students are the largest ethnoracial group from Kinder to high school in California (55%) (Census, 2023). In higher education, the Latinx population varies by institution type. Within public higher education, Latinx students make up 43% of all students. Most California public high school students who enroll in college (57%) attend community colleges (Kurlaender et al., 2018). Increasingly, these students are Latinx. At the national level, Latinos are more likely to enroll in community college than their white peers (Flink, 2018; Fry, 2002). In California, although 78% of Latinx students enroll in community college to obtain an associate degree and/or transfer to a four-year institution, only 32% have successfully transferred to a four-year institution after six years (Reddy & Siqueiros, 2021). Of Latinx students who enrolled in California Community Colleges in 2015-2016, only 11% graduated with an Associate's degree within four years (Reddy & Siqueiros, 2021). Little is known about Latinx students' college satisfaction who transfer to four-year institutions.

The significance of this study is the comparison of transfer and non-transfer Latinx college experiences. As highlighted above, community college is the predominant entry

point to higher education for Latinx students (Martinez & Fernández, 2004) because of their open access policy and relative affordability compared to the tuition rates among four-year institutions. Typically, tuition costs at a community college are two to three times cheaper than four-year institutions. For students who started their higher education path at a community college and intended to transfer to a four-year institution in 2010, less than one-third (31.5%) successfully managed to transfer by 2016 (Dowd et al., 2020). Latinx and Black students generally have lower rates of transfer from two-year to four-year institutions than their Asian and White counterparts (Wassmer et al., 2004). Once students transfer to a four-year institution, their college persistence and degree attainment success are impacted by their new institution's academic and social system. Thus, we might expect the campus experiences of transfer and first-time enrollees to differ.

Not only do community college enrollment and transfer rates differ across racial and ethnic groups, but there are also variations in degree attainment at four-year institutions based on ethnoracial groups. Work by DeAngelo et al. (2011) showed significant differences in degree attainment by ethnoracial groups. According to the U.S. Census for the year 2022, for adults aged 25 and older with a bachelor's degree, Asian American and non-Hispanic White population have the highest rates (59.3% and 41.8%, respectively). On the other hand, 20.9% of the Hispanic population earned a bachelor's degree (Census, 2023). Latinx students who enter higher education immediately from high school have different experiences adjusting to college than their transfer peers, who generally make multiple institutional adjustments, first to community college and then to a four-year institution. It is vital to examine the experiences of transfer and non-transfer Latinx students to obtain a nuanced view of students' college trajectories and the factors that impact or aid their retention and degree attainment.

Although research has increased in the past decades on Latinx transfer students, there is limited work detailing the Latinx college adjustment and satisfaction after transferring to four-year institutions (Abrica & Rivas, 2017). In this study, I examine college adjustment in five domains: academic belonging, student agency, community, faculty and academic advisor support, and equity. For college satisfaction, I examine how students rate their college satisfaction in three components: academic, community, and student well-being. Not only do transfer students add a layer of complexity, but limited work has been completed on elite public institutions focusing on historically underrepresented students, particularly Latinx transfer students (Carnevale & Strohl, 2013; Santiago et al., 2019). In this study, I contribute to the literature regarding Latinx transfer students' college satisfaction and adjustment at an elite four-year public institution compared to their non-transfer Latinx peers. Because of data limitations in research, typically, Latinx students are combined into one broader group classification. However, Latinx students are heterogeneous with different ethnic backgrounds, languages, socioeconomic statuses, different family generation experiences with higher education (i.e., first-generation college students in comparison with others), varied workload responsibilities, and heterogeneity across a host of other essential axes of differentiation. The motivation behind this study is to use quantitative methods that examine disaggregated data for Latinx students' college adjustment and satisfaction from a

recently collected dataset that permits a close analysis of these dynamics.

For this study, I examine college satisfaction of transfer and non-transfer Latinx students by incorporating factors related to students' satisfaction and degree attainment in prior literature (Bettinger & Baker, 2014; Kuh et al., 2006; Torres & Hernandez, 2009). The factors include academic and community belonging, a sense of well-being, and ethnic and racial diversity of faculty, administrators, and staff on campus. I argue that these three distinct but related dimensions of college satisfaction may shape how well students adjust to their new college environments based on prior studies that find a relationship between students' academic and community belonging on academic integration and encouragement (Torres & Hernandez, 2009), student resources available related to students' success (Bettinger & Baker, 2014), and campus racial climate (Hurtado, 1992). For academic and community satisfaction, I explore the following variables: students' sense of belonging in classes, sense of community on campus, positive interactions with faculty and graduate teaching instructors, interactions with academic advising, and positive interactions with other students. For student well-being and resource satisfaction, I explore students' sense of advocating for themselves, students' services addressing students' needs, student housing, food security, and financial aid services. Lastly, for racial and ethnic diversity satisfaction, I explore students' perspectives on the ethnic and racial diversity of faculty, administration, and staff.

In this paper, I use a college adjustment measurement developed as a new tool to identify students' holistic adjustment to college, incorporating five domains: academic belonging, student agency, community, faculty and academic advisor support, and equity. I use college adjustment as an independent and dependent variable in this study to examine the association with college satisfaction and the role of personal and environmental factors in students' college experiences.

Specifically, in this chapter, I ask:

1. Is there a difference in mean college satisfaction for transfer and non-transfer Latinx students?
2. Is there an association between college adjustment and college satisfaction for Latinx students after controlling for transfer status, gender, household income, and first-generation?
3. Is there a difference in mean college satisfaction between transfer and non-transfer Latinx students after controlling for college adjustment, gender, household income, and first-generation?

3.3 Literature Review

In the next section, I outline the literature on college adjustment and satisfaction. I summarize these two sections, focusing on Latinx students and Latinx transfers. It is essential

to differentiate between the larger body of the literature on college adjustment and satisfaction and concentrate specifically on Latinx students and the experiences of Latinx transfer students.

College Adjustment

College adjustment has been conceptualized and operationalized in a multitude of ways, ranging from the different timeframes of adjustment (e.g., first- or second-year college experience) to institutional barriers that impact students' college experience (Johnson et al., 2014). Historically marginalized students' college adjustment and experiences are affected by structural inequities (Hurtado et al., 2007). The magnitude of impact can depend on various stressors such as socioeconomic status, gender inequity, and the capacity of colleges and universities to effectively serve first-generation college students (Ostrove & Long, 2007; Pascarella et al., 2004).

One of the components of college adjustment is a sense of belonging. Scholarly work has examined how the sense of belonging within social and academic spheres of higher education can lead to better academic performance (Ostrove & Long, 2007). The work by Ostrove and Long (2007) examined how social class hierarchies define the sense of belonging in college and how it informs adjustment to college. They examined 322 students at a liberal arts college. They found that a sense of belonging in college was positively associated with academic performance but not the perceived quality of students' college experiences. Overall, they found that belonging was a mediator between social class backgrounds and adjustment to college. In this study, I include students' social class as a control variable to account for the impact of social class on students' adjustment and college satisfaction.

Additional research has delved into the college adjustment experiences of first-generation students. Some of this research illustrates that first-generation students have distinct and more complicated college adjustment experiences compared to their non-first-generation counterparts (Pascarella et al., 2004). Specifically, Pascarella et al. (2004) found that first-generation college students face disadvantages in navigating higher education spaces. First-generation students also have more difficulty in their college transition from high school and are less likely to persist in graduating than their middle-class peers (Pascarella et al., 2004). Research by Hertel (2002) examined similarities and differences in college adjustment for first- and second-generation college students. Using the Student Adaptation to College Questionnaire, they measured the overall index of college adjustment, including four subscales for college adjustment: academic adjustment, social adjustment, personal-emotional adjustment, and goal commitment-institutional attachment. Employing multiple regression analyses, they found that first-generation students had less parental income support and social adjustment when compared to second-generation students. In addition, for second-generation students, on-campus friend support predicted overall adjustment (Hertel, 2002).

A more recent study examines first-generation and continuing-generation college students' sense of belonging and student engagement (Gillen-O'Neel, 2021). Using person-level and daily dynamics sense of belonging and student engagement, results showed that belonging

was associated with all types of student engagement at the personal and daily levels. For example, students with a higher sense of belonging tended to have higher emotional and behavioral engagement (Gillen-O'Neel, 2021). For first-generation students, they were prone to day-to-day fluctuations in their sense of belonging. These results indicate that a sense of belonging is critical for all students, particularly first-generation students, to maintain engagement (Gillen-O'Neel, 2021). When exploring the stressors affecting students' college adjustments, it is essential to adopt a lens that considers how stressors—or positionalities that are generally marginalized—may layer upon one another to shape academic outcomes. This intersectionality influences the diversity of students' college experiences. Moreover, the type of institutions students attend can significantly impact students' college adjustment.

When examining college adjustment, research has also looked at the experiences of historically marginalized students and their experience attending predominantly white institutions. Ethnoracially minoritized students attending predominantly white institutions may rate their quality of college experiences lower than White students because of the perception of prejudices and harsh racial climates, which can also impact their likelihood of completion (Allen, 1988; Brown et al., 2024; Fleming, 1985; Hurtado, 1992). For example, Fleming (1985) highlighted that adjustment could be affected by curriculum, financial need, lack of support services, and relationships with faculty, peers, and staff, which are all less likely to center minoritized students at predominantly white institutions.

Nora and Cabrera (1996) studied the experiences of first-year college students in a Midwest institution, analyzing factors critical in the persistence process among minorities and white students. Their findings showed that prejudice and discrimination negatively impacted ethnoracially minoritized students' adjustment. A more recent study on perceptions of ethnic discrimination by students of color during their first weeks of college attending predominately White institutions predicted retention during students' second year, and it was mediated by a lowered sense of belonging (Brown et al., 2024). In summary, college adjustment varies by institutional inequities historically marginalized students experience, resources provided within institutions, and the type of institutions students attend. In the next section, I expand on the literature on Latinx college adjustment.

Latinx College Adjustment

Research on college adjustment for Latinx students has examined differences in the college transition based on social class, first-generation status, and the type of high school students attend (Duncheon, 2018; Santiago et al., 2019). These studies use a variety of datasets, such as student cohorts within an institution, national datasets, and first-year college transition datasets. The focus of these studies has examined social challenges students experience during college (racial microaggressions), first-year persistence (examining second-year re-enrollment as an outcome variable), retention and graduation rates (outcome variables), and university resources students used that aid their adjustment to resources outside of the university (Duncheon, 2018; J. Llamas et al., 2020; T. Yosso et al., 2010). Furthermore, additional studies incorporate students' social networks, academic agents within the university,

and familial support as essential systems aiding students during their transition (Archuleta et al., 2021; Murphy & Murphy, 2018).

Understanding the role of social class is crucial when examining college adjustment for Latinx students because students can have different access levels to resources and opportunities, financial barriers, and cultural capital necessary to navigate higher education. According to a report by *Excelencia*, for the 2015-2016 academic year, 74% of Latinx students applied for financial aid, and 72% received some financial assistance (Santiago et al., 2019). On average, Latinx students' family income is lower than that of other racialized groups (Santiago et al., 2019). In a meta-analysis examining stress factors impacting Latino students' college adjustment by Quintana et al. (1991), they explore financial stress factors experienced by Latino and White students. Their results showed that seven studies included financial stress factors, including uncertainty about financial aid, repaying student loans, and parents' financial contributions. Overall, Latino students experience greater levels of academic and financial stress measures when compared to their White peers (Quintana et al., 1991). A more recent study by Longerbeam et al. (2004) found that Latino undergraduates were more frequently worried about how to pay for college and dropping out of college because of financial reasons than non-Latino students.

In addition to considering social class as an indicator, it is essential to recognize that first-generation status also significantly influences students' college adjustment. *Excelencia in Education* reported that Latinx students are more likely to be first-generation college students than other ethnoracial groups (Santiago et al., 2019). For the 2015-2016 academic year, 44% of Latinx students were the first in their families to attend college, while 34% of African American, 29% of Asian, and 22% of White students were first-generation students (Duncheon, 2018; Santiago et al., 2019). Duncheon's case study (2018) examined eight first-generation Latinx students' first-year transition experiences. These students graduated from a low-performing urban high school. Using Yosso's asset-based framework on community cultural wealth, the study highlights that students rely on their culture and community to transition to higher education. For example, when facing academic difficulties, students responded with a combination of aspirational and navigational capital (Duncheon, 2018). Another study by J. Llamas et al. (2020) examined factors impacting first-year Latinx students. Using a qualitative approach, they found detrimental components to students' adjustment, such as academic challenges, cultural difficulties, financial need, and social struggle. On the other hand, they found beneficial factors to students' college adjustment, such as belonging, cultural identity, motivation, and social support. They also highlighted the critical role of Latinx peers as an emerging central factor.

It is important to note that some of these studies incorporate indicator variables such as first-generation status to account for the variance explained in the model to obtain a more precise association (Duncheon, 2018). As social researchers, it is essential to consider the social and power dynamics these variables play and how inequality is manifested, particularly for Latinx students, many of whom are first-generation students (Santiago et al., 2019). As we know, higher education is a system that is difficult to navigate, mainly if you are first-generation or come from a historically marginalized population with different circumstances

than those who are non-first-generation students and from non-marginalized populations (Rendon, 1994). Overall, statistical relationships function as an approximation to provide a glimpse into how various social processes are unfolding.

In addition to exploring the differences in factors related to Latinx college adjustment, scholars have also focused on racial microaggressions and exclusion experienced by Latinx students. The work by Yosso et al. (2010), drawing from critical race theory, explored incidents of racial microaggressions experienced by Latinx students at three selective universities. Their works showed that Latinx students encountered interpersonal microaggressions at the institutional level. In addition, students experienced feeling culturally excluded from the campus community. Experiences of exclusion impacted students' adjustment to college. Students also highlighted the lack of representation of faculty of color (T. Yosso et al., 2010). Other aspects related to Latinx college adjustment are community connections and family support as measured by students' college persistence (Cabrera et al., 1999). As well as the additional responsibility Latinx students have and the need to sacrifice schoolwork (Hurtado et al., 2007). In addition, work on student resilience by J. D. Llamas and Morgan Consoli (2012) found that family support predicts college adjustment for Latinx college students.

Regarding campus climate and Latinx college adjustment, Hurtado et al. (1996) examined the dimensions of campus climate and transitional experiences common for first-year students. They used the Student Adaptation to College Questionnaire (SACQ), which measures students' overall adjustment, using four scales: academic adjustment, social adjustment, personal-emotional, and attachment. One of their findings highlighted the type of institutions students attended and its association with higher SACQ measures (Hurtado et al., 1996). Their results showed that students in private colleges had higher social adjustment and attachment levels. Meanwhile, students attending institutions with larger Hispanic student enrollments were more likely to report ease in academic adjustment during their second year of college (Hurtado et al., 1996).

Other work by Suarez-Orozco (2015) highlights how historically marginalized students encounter cultural, gendered, and racial microaggression in the classroom. In many cases, students encounter these microaggressions, which are targeted at students individually (Suárez-Orozco et al., 2015). Research that has examined the long-term consequences of Latinx students experiencing microaggression includes feelings of inadequacy and self-doubt (Pérez Huber & Solorzano, 2015). In addition to examining the college adjustment experiences of Latinx students, it is imperative to center our analysis on transfer Latinx students, acknowledging and integrating their lived experiences and how these experiences might differ from the experiences of Latinx students who are first-time enrollees.

Latinx Transfer Students and College Adjustment

Overall, the literature on the transfer process is focused on *vertical transfer* – students who transfer from a community college to a four-year institution- and *lateral transfer* – students who transfer between four-year institutions. *Reverse transfer* – students attending a four-year institution but returning or enrolling simultaneously and taking classes at a

community college, and *dual credit* – students attending high school and a community college simultaneously (Jain et al., 2020). A less common study area is the transfer process of incarcerated and formerly incarcerated students (Turner-Odom, 2016). In addition, the transfer process is divided into temporal phases: students' experiences at a community college who intend to transfer, the transfer process, experiences once students transfer, and the retrospective approach evaluating their transfer experience (Jain et al., 2020). Work on students' experiences before they transfer typically examines the course completion, remedial courses, the intent of students to transfer, academic and professional achievement goals, and degree attainment before transferring. For example, the "cooling out" effect (Bahr, 2008; Clark, 1982). Clark describes it as a gradual disengagement of students' profession and academic goals. Academic agents (advisors or counselors) recommend alternative careers based on perceived assumptions about students' preparation, skills, and abilities (Clark, 1982). Although community college is an alternative pathway to higher education, students can change their academic and professional goals, and many times, students do not transfer to a four-year institution (Crisp & Nuñez, 2014). For the navigation process, researchers have examined university students' connections while transferring, peer connections, and cultural capital students learn along the way (Bailey, 2015).

Once students transfer to a four-year institution, research has examined the *transfer shock* developed by Hills (1965). Hills (1965) conducted a literature review based on the outcomes of students who successfully transferred from 1928 to 1964. Of the 46 studies reviewed by Hills, 44 reported students experienced a transfer shock, while only two showed no transfer shock (Hills, 1965). Under transfer shock, students experience a temporary drop in grades during their first or second semester after transferring to a four-year institution (Best & Gehring, 1993; Graham & Dallam, 1986). Consistent with the literature in a more recent study by Jaggars et al. (2023), examining 25,000 transfer students at a large flagship university, found that transfer students had an average of 0.30 drop in GPA during the first term after transferring. The college adjustment process for transferring students is more complex (Bailey, 2015). Transfer students are impacted by different elements of their new institution from the academic, social, and institutional levels. For example, at the academic level, students learn how to adjust to their new classes' size, curriculum structure, teaching resources, or online portals for assignments (e.g., canvas, blackboard, etc.) (Fematt et al., 2021). Students learn the new campus culture at the four-year institutions at the social level while creating new groups of friends (Pascarella & Terenzini, 1991). Students also adjust to a new system at the institutional level, such as enrolling in classes, using resources like tutoring, and learning new institutional policies (M. Mayhew et al., 2011).

Elaborating on the transfer shock, other bodies of literature have expanded the focus on transferring students' experiences at the social and psychological levels. For example, the work of Pascarella and Terenzini (1991) used the framework of *cultural shock* to portray students' experiences transitioning from one academic environment into a new one. Latinx transfer students' adjustment transition differs from their white peers (Wawrzynski & Sedlacek, 2003). Latinx students have other intersecting identities and backgrounds, which creates a different college adjustment experience (Nuñez, 2009). A limited body of work

has focused explicitly on Latinx transfer students' adjustment levels. Studies have looked at all students and examined differences by race and ethnic background. For example, using latent class analysis, Fematt et al. (2021) examined how different subgroups participating in a first-year transfer course impacted their academic and social adjustment. The results showed that students who participated in the course reported positive adjustment and had the smallest decrease in their GPA. However, their total sample included only 18.8% ($n = 151$) of Mexican/Latino students (Fematt et al., 2021). Further research on Latinx transfer students is essential to comprehensively grasp their needs and provide adequate support as they transition to a four-year institution.

Other work on transfer students' adjustment experiences and difficulties has looked at the differences by gender and race. For example, the work by Young and Litzler (2013) examined 1,079 engineering transfer student experiences using the Laanan-Transfer Student Questionnaire (Laanan, 2004). Young and Litzler divided the factorial adjustment structure into academic, social, and psychological dimensions. The results showed that the measurement properties of the instrument items are invariant across race (Whites, African Americans, Native Americans, Hispanics, and Asians), gender (men and women), and the type of institution students transferred to (Young & Litzler, 2013). In addition, the work by Wawrzynski & Sedlacek (2003), using the Transfer Student Survey, found that components of college adjustment vary by race and gender. For example, students of color were expected to incorporate into the new institution by interacting with faculty and students outside of class (Wawrzynski & Sedlacek, 2003). Regarding gender differences, female students were more interested in a holistic expectation for their education, whereas male students were more interested in the academic aspects. In other words, their instrument was valid for measuring adjustment to college across groups with different demographic backgrounds (Wawrzynski & Sedlacek, 2003).

Further research into the transfer experiences of Latinx students was conducted by Del Real Viramontes (2021), utilizing the framework of community cultural wealth. This study investigated the post-transfer journey of Latinx students ($n = 10$), revealing that the lack of financial aid resources and social and academic support in the receiving four-year institution prompted these students to rely on their aspirational, navigational, familial, and social capital as coping mechanisms (Del Real Viramontes, 2021). Additionally, Sanchez and Morgan (2022) conducted a study on Mexican and Mexican American students ($n = 11$). Among the five emerging themes related to academic resilience during the transfer process, students emphasize the importance of mentor support, defined as guidance, advice, and encouragement received in formal and informal settings. Furthermore, students highlighted the significance of finding a sense of community, which they defined as having a sense of belonging within both academic and social spheres. These studies offer valuable insights into the challenges Latinx transfer students face and the strategies they employ to navigate their educational journeys.

In addition to examining race and gender, another area of literature has concentrated on evaluating the impact of orientation programming on academic and social adjustment as integral components of learning outcomes. For example, Mayhew, Stipeck, and Dorow (2011)

examined first-year and transfer students at a public and predominantly White institution. Overall, transfer students agree that orientation classes impact their academic adjustment but not socially. When examining differences by race and ethnicity, students of color were more likely to attribute their successful social adjustment to campus from the orientation classes compared to their White peers (M. Mayhew et al., 2011). DeWine et al. (2017) also reported that orientation programs contribute to students' successful transition. Also, a more recent work by Farina (2012) examines the impact of transfer seminars on students' college adjustment. Results showed that students' attitudes toward their education and study strategies changed over time. These changes were reflected in students' concerns about financial college and creating a course schedule (Farina, 2012).

Latinx transfer students transitioning from two-year to four-year institutions encounter a novel educational environment, from the broader university structure to individual interactions with peers (M. Mayhew et al., 2011). Their experiences notably diverge from their White counterparts (Wawrzynski & Sedlacek, 2003). Orientation programs and transfer seminars have proven beneficial for Latinx transfer students (Farina, 2012; M. Mayhew et al., 2011). These investigations underscore the hurdles Latinx transfer students face and the tactics they employ to acclimate successfully. There is a need for research on the college adjustment experiences of Latinx students, both for transfer and non-transfer alike. This study delves into the association between college adjustment and students' college satisfaction while factoring in transfer status, gender, household income, and first-generation status. Building upon prior research, this study uses a larger sample size ($n = 63$).

College Satisfaction

College satisfaction has different definitions in the literature. For example, Hallenbeck (1978) defines it as students' satisfaction with their overall college experience. In contrast, Astin (1977) defines it as students' subjective evaluation of their educational experience. Alternatively, Okun and Weir defined college satisfaction as a "student's cognitive evaluation of the overall quality of his/her college life at a particular institution of higher education." (Okun & Weir, 1990, p. 59) Okun and Weir's definition of college satisfaction uses a whole perspective instead of just focusing on some components. This allows students to evaluate the entirety of the college experience, assigning distinct ratings to individual components (Okun & Weir, 1990). College satisfaction comprises different elements such as students' course experiences, student resources, and a sense of belonging (Hurtado & Carter, 1997; Navarro et al., 2005).

Beyond its definition, college satisfaction in the literature has been used to explore students' college experience, from success, persistence, retention, campus racial climate, belonging, and engagement. For example, Kuh et al. (2005) examined the link between college satisfaction and student success (levels of student engagement and graduation). In addition, in a longitudinal and multi-institutional study, Pascarella et al. (2011) examined the impact of teacher's effective instruction on first-year persistence. They examine students' re-enrollment for the second year of college at the same institution. Results showed that effective instruction (instructional organization and clarity) increased student re-enrollment.

Overall, this relationship was mediated by student satisfaction with the quality of education and experience (Pascarella et al., 2011). More recent studies have found that meaningful engagement with faculty members facilitates students' sense of belonging, satisfaction, and overall well-being (Einarson & Clarkberg, 2010; Trolan et al., 2022). Furthermore, alongside students' re-enrollment, the literature has examined campus and racial climate and its impact on overall college satisfaction.

For example, Fischer (2007) examined students' perceptions of racial climate and its association with college satisfaction and persistence prediction. Results showed an association between campus racial climate and college satisfaction across racial and ethnic backgrounds, and college satisfaction predicted college persistence (Fischer, 2007). In addition, Johnson et al. (2014) examined White students versus students of color experiences at a selective research university. Their results showed that for both groups of students, their perceptions of the campus environment, such as friendliness and respectfulness, predicted institutional satisfaction. In turn, it impacted students' retention for the second year. Their results also highlighted the importance of students' first-year experiences and the long-term effects (Johnson et al., 2014).

A more recent research by Museus et al. (2018) explores how culturally responsive environments foster a sense of belonging among racially diverse students, ultimately contributing to their graduation rates. Using survey data 870, results showed a significant difference in students belonging between White and students of color (Museus et al., 2018). As universities work to increase Latinx retention and degree attainment, it is critical to examine the college satisfaction of Latinx students in higher education. These experiences can also vary between institutions and within institutions.

Latinx College Satisfaction

As described previously, college satisfaction is associated with students' retention, success, institutional commitment, and degree attainment, varying by race and ethnic background, social class, and first-generation status (Fischer, 2007; Kuh et al., 2005; Museus et al., 2008; Pascarella et al., 2011). Schreiner and Nelson (2013) highlighted the importance of examining the unique college experiences of students from different racial and ethnic backgrounds. Instead of grouping students' experiences, these experiences must be separated to fully understand the satisfaction of students of color in college. In this section, I focus on research examining Latinx college satisfaction and its direct and indirect impact on students' college experience and outcomes.

Similar to the broader body of literature addressing college satisfaction, studies focusing on Latinx college satisfaction have investigated campus climate and the type of institutions students attend. For example, work by Rendon (1994) examined the impact of the cultural campus climate. Results showed that Latino students who experienced prejudices, biases, and stereotypes led to students experiencing culture shock. In addition, the characteristics of the institutions that students attend also impact Latinx college satisfaction. Scholars have examined African American and Hispanic students' engagement and satisfaction. For

example, the work by Nelson Laird et al. (2007) examined if HSI institutions served Hispanic students in similar circumstances that Historically Black Colleges and Universities (HBCUs) serve the population of African American Students compared to students attending predominantly white institutions (PWIs). They use data from the 2003 National Survey of Student Engagement. Their study showed that in terms of student engagement, college satisfaction, and overall development, Hispanic students attending an HSI have similar patterns to a Hispanic student attending a Predominantly White Institution (Nelson Laird et al., 2007). On the other hand, African American seniors are more engaged when attending HBCUs than when attending PWIs.

Additional work on Latinx college satisfaction has focused on students' fields of study. Flores et al. (2014) examined the academic satisfaction of Latino and White engineering majors attending a public HSI in the Southwest. Using social cognitive career theory (SCCT) and Lent and Brown's (Lent & Brown, 2008; Lent et al., 2000) satisfaction model, they hypothesized that "self-efficacy, outcome expectations and choice goals influence academic satisfaction in engineering" (Flores et al., 2014, p. 83). Their results showed that engineering academic satisfaction was positively associated with engineering self-efficacy, interest, and goals. In addition, they suggested that HSIs can provide learning opportunities such as verbal encouragement for both women and Latinx students, which in turn influence their anticipation of positive outcomes related to engineering (Flores et al., 2014).

Graff et al. (2013) highlighted the different challenges Latinx students face while enrolling in college, including language barriers, family and work responsibilities, hostile campus racial climate, and faculty not believing in students' ability to succeed. Using a nationally representative sample, Museus et al. (2008) examined the racial difference in direct and indirect effects of the campus racial climate on degree attainment. Overall, Latinx students were slightly less satisfied with the campus racial climate than their White peers. Also, White students reported higher levels of structural academic involvement than their Latinx peers (Museus et al., 2008). In addition, they found that higher levels of satisfaction with the racial climate for Latinx students were related to more positive degree completion outcomes (Museus et al., 2008).

Lastly, another component of Latinx college satisfaction has explored students' socioeconomic class. For example, the work by Soria et al. (2013) examined the Latinx self-identifies as working-class compared to middle- and upper-class counterparts attending public research universities. Overall, working-class Latinx students reported less satisfaction with their education experiences, lower sense of belonging, and campus satisfaction than their middle- and upper-class counterparts (Soria et al., 2013). Another recent study by Fan et al. (2020) investigated students' satisfaction and sense of belonging as crucial factors influencing student retention and success. Analyzing survey responses from 279 students enrolled at predominantly white institutions, the findings reveal that unrepresented groups (non-White, non-heterosexual, and non-Christian) reported lower levels of satisfaction and a diminished sense of belonging compared to the majority groups (Fan et al., 2020). In conclusion, the literature shows that Latinx college satisfaction is influenced by various factors, including campus climate, the type of institutions students attend, racial climate, and socioeconomic

status.

Latinx Transfer Students and College Satisfaction

Latinx transfer students' college satisfaction relates to students' college adjustment after students transfer from a community college to a four-year institution. As mentioned in the transfer college adjustment section, transfer students experience a temporary drop in their grades during their first and second semesters after transferring, known as *transfer shock* (Hills, 1965; York & Fernandez, 2018). An outcome of transfer shock is that students experience discouragement and dissatisfaction at their new four-year institution (Laanan, 1995).

Once students transfer to a four-year institution, research has focused on resources that help students transfer. Paton et al. (2023) examined the vertical transfer pathways (pre-, mid-, post-transfer, and post-graduation) by Paton et al. (2015). They focused on lower-division coursework and four-year institutions. Their results showed that Latinx students' vertical transfer success was aided by students' perceptions of the importance and satisfaction of the transferring components. The post-transfer pathway includes instructional facilities, full-time enrollment requirements, geographical access to degree programs, financial aid, cost of attendance, and student employment (Paton et al., 2023). Students also indicated a need to improve academic components in the transfer pathways, focusing on academic preparation, advising, and rigor (Paton et al., 2023).

Expanding on Latinx transfer students' perception and college satisfaction, work has also focused on first-generation transfer students and the implications for retention and success. Hawthorne and Young (2010) examined the impact of transfer students' perception of university experiences. They showed students who attended a community college before attending a four-year institution reported lower satisfaction levels with their overall university experiences; first-generation minority students exhibited this trend notably (Hawthorne & Young, 2010). In addition, first-generation Latinx students reported lower satisfaction levels with the university and instructor performance than their second-generation Latinx peers. Overall, their work highlighted that students from historically underrepresented backgrounds combined with first-generation college status place additional stress on their college experience and academic goals (Hawthorne & Young, 2010). Using disaggregated data within historically marginalized students, we can zoom in on sub-groups with different identities and how their college satisfaction impacts retention and degree attainment. The following section covers the conceptual framework for evaluating Latinx college satisfaction.

3.4 Conceptual Framework

This study examined Latinx students' college adjustment and satisfaction. These two components work bidirectionally and are essential for students' persistence and degree attainment. I investigate Latinx students' college adjustment and satisfaction by examining the similar-

ities and differences between transfer and non-transfer students. In doing so, in this study, I move away from pre-college factors and focus on college experience and environment as factors that influence Latinx college persistence and outcomes. In this study, I situate students' lived experiences and perceptions to provide a holistic and more representative view of Latinx students' college experiences. To be holistic and representative, this conceptual framework incorporates three components to students' overall college satisfaction: academic and community satisfaction, well-being and resources, and ethnic and racial diversity (Figure 3.1).

Expanding on the work of within-college effects, I focused on Latinx students' perspective of their college satisfaction in this study. This study's conceptual framework merges three components for more precise college satisfaction: academic and community satisfaction, well-being and resources, and ethnic and racial diversity (Figure 3.1). For each type of college satisfaction, I draw on previous frameworks and theories that highlight the importance of each college satisfaction with a focus on Latinx students.

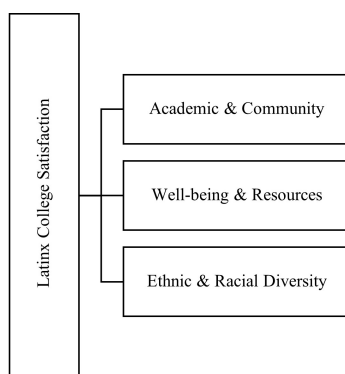


Figure 3.1: Components of Latinx Students' Perspective on College Satisfaction

Academic and Community Satisfaction

As part of academic and community satisfaction, I examined students' sense of belonging in classes, academic advising, positive interactions with faculty and graduate teaching instructors, a sense of community on campus, and positive interactions with other students. The literature underscores the significance of several components in students' adjustment, retention, and degree completion. Pascarella and Terenzini (1976) correlates with stronger perceptions of academic goals and intellectual development. Furthermore, Torres and Hernandez (2009) revealed that Latino students with mentors and advisors exhibited higher satisfaction with faculty, academic integration, institutional commitment, and encouragement. Social engagement, such as relationships with peers and involvement in co-curricular activities, as studied by Wolniak et al. (2012), positively influenced second-year students' persistence. Rendon

(1994) proposed a validation framework emphasizing equitable treatment and recognition of students' diverse experiences, enhancing academic and social integration. Recent research by Kuchynka et al. (2023) explored faculty mentorship among underrepresented groups in STEM fields, demonstrating its indirect effects on student's sense of belonging, identity, and self-efficacy, particularly when mentored by female faculty members. In summary, interactions with faculty, academic advisors, peer relationships, and teaching quality significantly impact students' academic and community satisfaction.

Student Well-being and Resources Satisfaction

The second component is student well-being and resource satisfaction, encompassing self-advocacy, student services, housing, food security, and financial aid. Bettinger and Baker (2014) conducted a randomized experiment on individual student coaching's effectiveness using InsideTrack, showing that students who received coaching were more likely to persist and remain in school even after the coaching ended. Moreover, Baber et al. (2019) suggest using disaggregated data at the institutional level to assess performance and implement equitable practices, mainly focusing on historically marginalized students. These practices should prioritize equity across all campus contexts and timeframes. It is crucial to prioritize students' well-being and student resource satisfaction as we develop new institutional policies to eliminate disparities and targeted programming to meet students' needs.

Ethnic and Racial Diversity Satisfaction

The third component is ethnic and racial diversity in college satisfaction. This component includes students' perspectives on the ethnic and racial diversity of faculty, administration, and staff. Research on the effect of ethnic and racial diversity on college satisfaction centers on the campus racial climate. Hurtado et al. (1996) conducted a longitudinal study on Latino students' adjustments, highlighting the significance of campus climate and first-year experiences on their adaptation. Additionally, Suárez-Orozco et al. (2015) discusses how marginalized students face cultural, gendered, and racial microaggression in classrooms. These microaggressions lead to inadequacy and self-doubt (Pérez Huber & Solorzano, 2015).

In conclusion, by integrating three key elements of students' college satisfaction—academic and community environment, well-being and resources, and ethnic and racial diversity—I seek to assess Latinx college satisfaction more comprehensively than prior research. Furthermore, this approach allows for the individual evaluation of each component's distinct impact on college adjustment. This study advances the literature on Latinx college satisfaction by providing a new method to examine college satisfaction within sub populations of Latinx college students.

The Latinx College Satisfaction model in this study is derived from three components, which collectively analyze students' perspectives on their college satisfaction. Along with college satisfaction, college adjustment is incorporated using a bidirectional relationship. First, I hypothesized that students with higher levels of college adjustment will have higher levels of

college satisfaction. Second, considering college generation status, first-generation students will have different college satisfaction levels than non-first-generation students. Knowledge about how to navigate college can explain the difference in levels of college satisfaction passed down from their parents who attended or did not attend college, also known as the hidden curriculum of higher education.

In summary, although the Latinx college population has continued to grow, Latinx students are underrepresented in higher education. A major alternative pathway to higher education for Latinx students is via community college and then transferring to a four-year institution. The Latinx college experience differs from that of their White peers regarding college adjustment and satisfaction. Examining their college satisfaction and adjustment is essential to increase and facilitate Latinx students' retention and degree attainment. The purpose of this study is to perform two multiple regression models to examine students' perception of academic and community, well-being and student resources, and ethnic and racial diversity college satisfaction of Latinx transfer students at an elite public institution in comparison to their non-transfer Latinx peers.

3.5 Method

Data

Data was collected during the Spring 2023 Semester at an elite public institution in the Pacific Northwest using the Elite Institution System Software. Data was collected via the Undergraduate Student College Transition and Adjustment (USCTA) survey. This survey was developed using two previous surveys that measured student adjustment levels (Harbin, 1997; Laanan, 2004). The survey was emailed to targeted programs for historically marginalized groups, major academic advisors, undergraduate courses, undergraduate student organizations, and affinity group centers on campus. The survey was distributed from April 26 to May 26, 2023. The survey included 130 items, Likert-style, multiple choice, and open-ended questions. Only 15 college satisfaction questions (see Appendix A) were used for this study, all Likert scale items (*Not at all Satisfied*, *Dissatisfied*, *Satisfied*, and *Very Satisfied*). In addition, ten questions from the USCTA survey were used to examine how *familiar* students were with students' services on campus and how *often* students accessed campus resources for first-generation, transfer, and disability services.

Demographic characteristics were also collected, such as age, gender, racial and ethnic identity, parent's total household income, first-generation status, if students identify with a disability, veteran status, student parent, and transfer status. Other academic data included high school GPA, transfer GPA, academic level, credits and semesters completed at the institution, current GPA, hours worked for paid wages, current major, and if they had changed or plan to change majors since starting.

In total, 203 students completed the USCTA survey. The subsample for this study only included students who selected "Hispanic/Latina(o)(e)(x)" as their identity ($n = 60$), as

well as students who indicated "Other" and listed Mixed (Mexican and White), White and Hispanic, and Mexican-Native ($n = 3$). In total, the sample for this study consisted of 63 students.

The college adjustment variable used in models one and two was created from study two of this dissertation. Students' college adjustment is measured by incorporating five domains: academic belonging, student agency, community, faculty and academic advisor support, and equity. This tool was developed and validated to measure students' college adjustment. In total, the new instrument consists of 65 items. Results from paper two showed that the instrument was a reliable measure of students' college adjustment.

Measures

The following variables were used:

Outcome Variable Model 1:

College Adjustment – A continuous logit weighted likelihood estimate (WLE) for students' college adjustment level. This variable was based on a total of 65 items.

Outcome Variable Model 2:

College Satisfaction – A continuous total student college satisfaction rating. This variable was created using an average of 15 questions about students' perspectives on college satisfaction.

Explanatory Variables:

Academic and Community Satisfaction – Initially, two continuous variables were created for academic and community satisfaction. However, these variables were highly correlated with a correlation of .61. To address this correlation, I combined both variables into a student academic and community college satisfaction score. This satisfaction score was created using an average of eight academic and community college satisfaction questions.

Well-being Satisfaction – A continuous well-being satisfaction score was created using the average of five questions about well-being and student resources college satisfaction.

Ethnic and Racial Diversity – A continuous satisfaction score for ethnic and racial diversity was created using the average of two questions about ethnic and racial college satisfaction.

Transfer status – A categorical dichotomous variable indicating a transfer student = 1 or a non-transfer student = 0.

First-Generation status – A categorical dichotomous variable indicating a first-generation student = 1 or a non-first-generation student = 0.

Gender – This categorical variable asked for students' gender, with the three categories being female, male, and non-binary. I created two dummy variables, male and non-binary, treating females as the reference group.

SES – This continuous variable ranged from 1 (less than \$20,000) to 5 (\$80,00 to \$149,999). All income values are in increments of \$20,000, except for the last value of \$70,000. None of the participants indicated having a household income higher than \$150,000.

Statistical Analyses

For research question one, a simple linear regression will investigate the differences in mean college satisfaction between transfer and non-transfer Latinx students. For research question two (Model 1), a multiple regression will examine the association between college adjustment and college satisfaction for Latinx students after controlling for transfer status, gender, household income, and first-generation. I employ model one below:

Model 1

$$\text{Adjustment}_i = \beta_0 + \beta_1 \text{AcademicCommunity}_i + \beta_2 \text{Well-being}_i + \beta_3 \text{Diversity}_i + \beta_4 \text{Transfer}_i + \beta_5 \text{Gender}_i + \beta_6 \text{SES}_i + \beta_7 \text{FirstGen}_i + \epsilon_i$$

For research question three (Model 2), a multiple regression will investigate the difference in mean college satisfaction between transfer and non-transfer Latinx students after controlling for college adjustment, gender, household income, and first-generation. I employ model two below:

Model 2

$$\text{College Satisfaction}_i = \beta_0 + \beta_1 \text{Adjustment}_i + \beta_2 \text{Transfer}_i + \beta_3 \text{Gender}_i + \beta_4 \text{SES}_i + \beta_5 \text{FirstGen}_i + \epsilon_i$$

3.6 Results

Descriptive Statistics

Demographics

The sample included 63 Latinx students: 17 transfer students and 46 non-transfer students (Table 3.1). A follow-up question was asked about which college students transferred. Seventeen students indicated transferring from a community college, while three indicated transferring from another four-year university (lateral transfer). These three students were not selected as "transfer" students. Sixty students picked Hispanic/Latina(o)(e)(x) as their identity, three students selected other and listed Mixed (Mexican and White), White and Hispanic, and Mexican-Native as their identity. The age average for the sample was 22.17,

ranging from 18 to 24 years old (standard deviation 6.77, Table 3.1). There were differences in the mean age for transfer and non-transfer students. The mean age for transfer students was 28.12, with age ranging from 20 to 54 years old (standard deviation 10.99). In comparison, the average age for non-transfer students was 19.98, with age ranging from 18 to 22 years old (standard deviation 1.42). More female students participated in the survey ($n = 50$) than male students ($n = 9$) and transgender students ($n = 4$). The majority of the sample ($n = 21$, 33.33%) listed their family income as less than \$20,000, followed by \$60,000 to \$79,999 ($n = 15$, 23.82%), \$80,000 to \$149,999 ($n = 12$, 19.05%) and \$20,000 to \$39,999 ($n = 11$, 17.46%), and \$40,000 to \$59,999 ($n = 3$, 4.76%).

Fifty-four students in the sample (85.71%) were first-generation students, and nine were non-first-generation students (14.29%). Overall, 15 students were first-generation and transfer students in the study. Twenty-three students identified as a student with a disability (36.51%), 37 did not identify as a student with a disability (58.73%), two preferred not to answer (3.17%), and one had a missing response (1.59%). None of the students in the sample were veteran students. Most students were not student parents ($n = 59$, 93.65%), and three were student parents (4.76%).

Variable	Frequencies	Mean	Std. dev.	Min	Max
Transfer Age	17	28.12	10.99	20	54
Non-Transfer Age	46	19.98	1.42	18	22
Overall Age	63	22.17	6.78	18	54

Table 3.1: Descriptive Statistics for Age

Academic Factors

The majority of the students selected that they have not changed and do not plan to switch majors since starting at the institution ($n = 41$, 65.08%), followed by yes ($n = 20$, 31.75%) and no, but I plan to change majors ($n = 1$, 1.59%). Overall, there were 20 majors represented in the study. Eight students listed a double major, and one listed a triple major. Political Science was the most popular major represented ($n = 11$), followed by Sociology ($n = 10$), Ethnic Studies ($n = 5$), Psychology ($n = 5$), Social Welfare ($n = 5$), Chicana/o and Latino Studies ($n = 4$), Media Studies ($n = 4$), and Legal Studies ($n = 4$) (see Appendix, Table C.9). The average number of semesters students completed was 5.06, ranging from one to eleven (standard deviation 2.61, Table 3.3). The average number of credits completed was 81.45, ranging from 13 to 225 (Table 3.3).

Over 50% of the sample have a college GPA from 3.5 to 4.0 ($n = 32$), followed by 3.0 to 3.49 (39.68%, $n = 25$), 2.5 to 2.99 (7.94%, $n = 7.94$) (Table 3.4). The majority of students' high school GPA was 3.5 to 4.0 (85.71%, $n = 54$), followed by 3.0 to 3.49 (6.35%, $n = 4$), and 2.0 to 2.49 (3.17%, $n = 2$). Most transfer students from a community college had a

Variable	Category	Frequency	Percent
Identity	Hispanic/Latina(o)(e)(x)	60	95.24
	Other: Mixed (Mexican and White)	1	1.59
	Other: White and Hispanic	1	1.59
	Other: Mexican-Native	1	1.59
	Total	63	100
Gender	Female	50	79.37
	Male	9	14.29
	Transgender	4	6.35
	Total	63	100
Family Income	Less than \$20,000	21	33.33
	\$20,000 to \$39,999	11	17.46
	\$40,000 to \$59,999	3	4.76
	\$60,000 to \$79,999	15	23.81
	\$80,000 to \$149,999	12	19.05
	Missing	1	1.59
	Total	63	100
Transfer Status	Transfer	17	26.98
	Non-Transfer	46	73.02
	Total	63	100
Transfer Source	Community College	17	26.98
	Other University	3	4.76
	Total	63	100
First-Generation	Yes	54	85.71
	No	9	14.29
	Total	63	100
Disability	Yes	23	36.51
	No	37	58.73
	Prefer not to Answer	2	3.17
	Missing	1	1.59
	Total	63	100
Student Parent	Yes	3	4.76
	No	59	93.65
	Prefer not to answer	1	1.59
	Total	63	100

Table 3.2: Student Demographics (n = 63)

Variable	Frequency	Mean	Std. dev.	Min	Max
Semesters	63	5.06	2.61	1	11
Credits	61	81.45	45.85	13	225

Table 3.3: Summary Statistics for Semesters and Credits Completed

Category	GPA	Frequency	Percent
Changed Majors	Yes	20	31.75
	No, I do not Plan to Change Majors	41	65.08
	No, but I Plan to Change Majors	1	1.59
	Missing	1	1.59
	Total	63	100
College	3.5 - 4.0	32	50.79
	3.0 - 3.49	25	39.68
	2.5 - 2.99	5	7.94
	Missing	1	1.59
	Total	63	100
High School	3.5 - 4.0	54	85.71
	3.0 - 3.49	4	6.35
	2.0 - 2.49	3	4.76
	Missing	2	3.17
	Total	63	100
Community College	3.5 - 4.0	14	82.35
	3.0 - 3.49	3	17.65
	Total	17	100
University	3.5 - 4.0	2	66.67
	Less than 1.99	1	33.33
	Total	3	100

Table 3.4: College, High School, and Transfer GPA for Latinx Transfer Students (n= 63)

transfer GPA of 3.5 to 4.0 (82.35%, $n = 14$), followed by 3.0 to 3.49 (17.65%, $n = 3$). For students who transferred from another university ($n = 3$), two had a transfer GPA of 3.5 to 4.0, and one had a transfer GPA of less than 2.0.

Student Resources and Student's Perspective on Barriers

I conducted additional descriptive analysis for transfer, first-generation, and students who identified as students with disabilities (Table 3.5). In this section, I will describe how familiar students are with offices on campus, how often they use the resources, students' perspectives

on facing institutional barriers, and institutional efforts to help students navigate higher education.

Transfer Students. Question four asked students, "Please rate how familiar you are with the following offices on campus." Most transfer students indicated they were *very familiar* ($n = 9$) and *somewhat familiar* ($n = 5$) with The Transfer Student Center. Question nine asked, "If you self-identify as a transfer student, how often do you use the resources the Transfer Student Center offers?" The majority of transfer students indicated *occasionally* ($n = 6$), followed by *often* ($n = 5$), *never* ($n = 4$), and *very often* ($n = 2$).

Students with Disabilities. For students with disabilities, the majority indicated they are *familiar* ($n = 11$) and *very familiar* ($n = 8$) with the Disabled Student's Program. Question six asked, "If you self-identify as a student with a disability, how often do you use the resources from the Disabled Student's Program?" The majority of students with disabilities indicated *occasionally* ($n = 9$), followed by *often* ($n = 7$), *very often* ($n = 4$), and *never* ($n = 3$).

Variable	Category	n	Percent
<i>How familiar are you with the following offices?</i>			
The Transfer Student Center ($n = 17$)	Familiar	1	5.88
	Not Familiar	2	11.76
	Somewhat Familiar	5	29.41
	Very Familiar	9	52.94
Disabled Student's Program ($n = 23$)	Familiar	11	47.83
	Somewhat Familiar	4	17.39
	Very Familiar	8	34.78
<i>How often do you use the resources?</i>			
The Transfer Student Center ($n = 17$)	Never	4	23.53
	Occasionally	6	35.29
	Often	5	29.41
	Very Often	2	11.76
	Total	17	100
The Disabled Student's Program ($n = 23$)	Never	3	13.04
	Occasionally	9	39.13
	Often	7	30.43
	Very Often	4	17.39

Table 3.5: Responses to Student Resources for Latinx transfer Students and Latinx students with Disability

Equity. Under the equity component of the survey, it asked students, "[As a transfer student], I face institutional barriers limiting my ability to succeed." Two additional questions were also worded [As a student with a disability] and [As a first-generation student].

Variable	Category	n	Percent
<i>I face institutional barriers limiting my ability to succeed.</i>			
As a transfer student ($n = 17$)	Agree Somewhat	11	64.71
	Agree Strongly	4	23.53
	Disagree Somewhat	1	5.88
	Disagree Strongly	1	5.88
As a student with a disability ($n = 23$)	Agree Somewhat	9	39.13
	Agree Strongly	10	43.48
	Disagree Somewhat	3	13.04
	Disagree Strongly	1	4.35
As a first-generation student ($n = 54$)	Agree Somewhat	15	27.78
	Agree Strongly	31	57.41
	Disagree Somewhat	4	7.41
	Disagree Strongly	3	5.56
	Does not apply	1	1.85
<i>(Name of institution) provides me with the resources and/or support programs I need to navigate higher education.</i>			
As a transfer student ($n = 17$)	Agree Somewhat	6	35.29
	Agree Strongly	3	17.65
	Disagree Somewhat	6	35.29
	Disagree Strongly	2	11.76
As a student with a disability ($n = 23$)	Agree Somewhat	12	52.17
	Agree Strongly	3	13.04
	Disagree Somewhat	5	21.74
	Disagree Strongly	3	13.04
As a first-generation student ($n = 54$)	Agree Somewhat	25	46.3
	Agree Strongly	1	1.85
	Disagree Somewhat	19	35.19
	Disagree Strongly	9	16.67

Table 3.6: Responses to Student Resources for Latinx Transfer Students, Latinx Students with Disability, and Latinx First-generation Students

Overall, eleven transfer students *agree somewhat* about facing institutional barriers. While ten students with disabilities indicated *agree strongly* that they face institutional barriers. For first-generation students, the majority *agree strongly* that they face institutional barriers ($n = 31$), followed by *agree somewhat* ($n = 15$).

Further examination of whether the institution provides resources that students need to navigate higher education (Table 3.6). The following question asked, "[As a transfer student], (name of institution) provides me with the resources and/or support programs I need to navigate higher education." This question was also worded for [As a student with a disability] and [As a first-generation student]. The results were split for transfer students. Six students *agree somewhat*, and six students *disagree strongly* with the statement. On the other hand, for students with disabilities, the majority *agree somewhat* ($n = 12$), and five students indicated *disagree somewhat*. Lastly, for first-generation students, the majority stated that they *agree somewhat* ($n = 25$), followed by *disagree somewhat* ($n = 19$).

Statistical Analysis

For research question one, a regression was conducted to examine the difference in college satisfaction between transfer and non-transfer Latinx students. Results showed that, on average, transfer students had .15 points higher college satisfaction than their non-transfer Latinx peers. However, this difference was not statistically significant ($p = .236$).

For research question two, the first multiple regression model examined the association between college adjustment and college satisfaction (academic and community, well-being, and diversity) for Latinx students after controlling for transfer status, gender, household income, and first-generation (Table 3.7). For every one unit increase in academic and community college satisfaction, the estimated mean college adjustment score increases by .31, controlling for all other covariates in the model. For every one-unit increase in well-being college satisfaction, the estimated mean college adjustment score increases by .25, controlling for all other covariates in the model. For every one-unit increase in diversity college satisfaction, the estimated mean college adjustment score by .13, controlling for all other covariates in the model. However, this was not statistically significant.

For research question three, the second multiple regression model examined the difference in mean college satisfaction between transfer and non-transfer Latinx students after controlling for college adjustment, gender, household income, first-generation status, and work hours per week (Table 3.8). For each one-unit increase in the mean college adjustment, the estimated mean college satisfaction score increases by .57, controlling for all other covariates in the model. The estimated mean college satisfaction score for first-generation students is 0.24 points lower than for non-first-generation students, controlling for all other covariates in the model. The estimated mean college satisfaction score for Latinx students was 1.92. There was no statistically significant difference in the mean college satisfaction between transfer and non-transfer students, controlling for other covariates in the model.

Variable	Coefficient	Standard		<i>p</i>	95% CI	
		Error	<i>t</i>		Lower	Upper
Academic & Community	0.31*	0.12	2.46	0.017	0.06	0.56
Well-being	0.25*	0.10	2.51	0.015	0.05	0.44
Diversity	0.13	0.07	1.97	0.054	0.00	0.27
Transfer	-0.05	0.10	-0.54	0.589	-0.25	0.15
Male	0.10	0.14	0.72	0.474	-0.18	0.37
Nonbinary	0.08	0.18	0.42	0.675	-0.29	0.45
Socioeconomic Status	0.01	0.03	0.21	0.833	-0.06	0.07
First-Generation	-0.01	0.14	-0.06	0.956	-0.29	0.28
Intercept	-1.13***	0.32	-3.52	0.001	-1.77	-0.49

*** $p < 0.01$, * $p < 0.1$

Table 3.7: Summary Multiple Regression for College Adjustment Outcome (n = 62)

Variable	Coefficient	Standard		<i>p</i>	95% CI	
		Error	<i>t</i>		Lower	Upper
College Adjustment	0.57***	0.09	6.06	0.001	0.38	0.75
Transfer	0.10	0.09	1.17	0.247	-0.07	0.28
Male	0.01	0.11	0.06	0.955	-0.22	0.23
Nonbinary	0.10	0.16	0.62	0.538	-0.22	0.42
Socioeconomic Status	-0.04	0.03	-1.61	0.113	-0.10	0.01
First-Generation	-0.24*	0.12	-2.05	0.045	-0.48	-0.01
Intercept	1.92***	0.15	12.85	0.001	1.62	2.22

*** $p < 0.01$, * $p < 0.1$

Table 3.8: Summary Multiple Regression for Mean College Satisfaction Outcome (n = 62)

3.7 Discussion

Higher education is vital for upward social mobility, particularly for low-income, first-generation, and historically marginalized populations. Many Latinx students come from low-income backgrounds and are the first in their families to attend college. When Latinx students graduate high school and enroll in college, they often make generational leaps (Fry, 2002). As they enter two-year and four-year institutions, their experiences are shaped by the type of institutions they enroll in, university-wide and departmental climates, resources available for students, amount of financial aid allocation, and representation of ethnoracial groups by faculty, administrators, and staff, impacting their retention, persistence, and degree attainment. This study elaborates on the general conversation in higher education

about within college effects on students' college satisfaction and adjustment, focusing on Latinx transfer and non-transfer students.

First, limited quantitative literature examines the college experiences of Latinx students attending selective elite public institutions. A contribution of this study is exploring the Latinx college experience for transfer and non-transfer students. I found no statistically significant differences in students' mean college satisfaction between transfer and non-transfer Latinx students. Woosley and Johnson (2006) found no differences in student satisfaction at the academic level for transfer and non-transfer students. This is an important finding; the literature on transfer students discusses students experiencing a *transfer and cultural shock* during the first and second semesters (Hills, 1965; Pascarella & Terenzini, 1991). This study examined students from one to eleven semesters beyond their first and second semesters. Results highlight that Latinx transfer students do not differ in college satisfaction from their non-transfer Latinx peers. One explanation of this finding can be that transfer and non-transfer students' college experiences are shaped or constrained by a system of inequality in higher education. This system of inequality can impact students' overall college satisfaction.

On the other hand, work by Rennick and Kim (2021) has examined student engagement differences between transfer and non-transfer Latinx students, finding that transfer students have lower levels of engagement in comparison to their native students. Additional research can examine the type of resources the university provides to transfer students, allowing them to have college satisfaction and engagement levels like their non-transfer peers. Qualitative research on students' testimonies of their college experiences can highlight more in-depth the differences and similarities between transfer and non-transfer Latinx college satisfaction at an elite public institution.

Second, the literature examining students' college adjustment and college satisfaction has found academic and community belonging (Pascarella & Terenzini, 1976; Wolniak et al., 2012), student well-being and resources available to students (Bettinger & Baker, 2014; T. J. Yosso & Solorzano, 2006) as influential components. This study found a positive association between academic, community, and student well-being and resources college satisfaction and students' overall college adjustment. This finding aligns with previous studies confirming that Latinx students' college adjustment is associated with academic, community, well-being, and college satisfaction in a bidirectional way.

Third, after combining all three components of college satisfaction (academic, community, well-being, and ethnic and racial diversity), there was a positive association with college adjustment. In the first model, only academic, community, and well-being college satisfaction was statistically significant in the association with college adjustment. When all three of these dimensions are combined, the aggregated significance effect is likely a result of a robust direct effect from academic, community, and well-being. These findings are consistent with prior literature. For example, the work by Torres and Hernandez (2009) on Latino students attending urban institutions with an advisor was associated with higher satisfaction levels and academic adjustment. In addition, as part of community satisfaction, the work by Kuh et al. (2006) highlighted that students are more comfortable seeking help when they feel like they are part of a community. Another study by Oh (2014) found an association between

college adjustment and major college satisfaction among nursing students.

In addition, another major finding showed that first-generation students had lower college satisfaction than their non-first-generation college peers. These results confirm and extend work conducted decades ago. For example, Hertel (2002) found that first-generation students had lower social adjustment than their non-first-generation peers. Also, Hawthorne and Young (2010) found that first-generation Latinx students had lower satisfaction levels at the university and instructor level than their second-generation peers. Gillen-O'Neel (2021) also highlighted that, particularly for first-generation students, a sense of belonging is crucial for student engagement. This study highlights the importance of Latinx college satisfaction and adjustment. Future research needs to incorporate other intersecting stressors that impact the overall college experience within a particular student group.

As we work towards improving retention and graduation rates for Latinx students, this work provides a new way to examine the college experience of Latinx students through a bidirectional association between college satisfaction and college adjustment. For model one, when academic, community, and well-being college satisfaction increased, college adjustment also increased. For model two, the aggregated college satisfaction (academic and community satisfaction, student well-being and resources satisfaction, and ethnoracial diversity satisfaction) increased when college adjustment increased. This study also uses a new instrument for measuring Latinx students' adjustment levels from paper two of this dissertation. In practice, administrators can use the results to inform the development of targeted programming to aid Latinx students at their institutions (Sánchez-Connally, 2018). The study results provide a better understanding of the association between college adjustment and college satisfaction in different components: academic, community, well-being, and ethnic and racial levels.

3.8 Limitations and Future Research

One of the limitations of this study is the gender representation in the sample. This study had more female students ($n = 50$) than male students ($n = 9$). Generally, the sample is representative in some ways of the realities of the Latinx gender divide in higher education. Nationally, Latino males enrolled in college in lower numbers than their Latina female peers (Britton & Moreno Luna, 2022). Future studies need to focus on male Latino college adjustment and satisfaction, given disparities in educational attainment by gender among Latinx students. Another limitation of the study recruitment was that students learned about participating in the survey from programs and services for low-income, transfer students, and historically marginalized students. I hypothesize that students participating in these programs benefit from their services and, therefore, have a different college experience than those students not participating and benefiting from their programs. Future studies can control for participation in programming or compare to students not participating.

This study can be expanded by obtaining a larger sample size at other universities to see if Latinx students' college satisfaction and adjustment differ by the type of institutions students attend. This study took place at an elite public institution, and subsequent research

can be conducted at a similar university to compare results across institutions. In addition, by obtaining a larger sample, we can add and control additional stressors that have been shown to impact students' college adjustment and satisfaction. In addition, a more extensive study will help compare Latinx transfer students' satisfaction to that of Asian, Black, and White transfer students' satisfaction. This comparison will allow us to see if a particular institution will benefit from expanding resources to serve all transfer students by conceptualizing students as having similar experiences or whether or not multiple particular programmatic efforts might prove more beneficial.

This study can inform higher education institutions, including emerging Hispanic Serving Institutions (HSI) and certified HSIs. This study contributes to the puzzle of understanding the complex lived college experiences of Latinx students that can vary in many ways from their White peers. These experiences are shaped and constrained by a multitude of systematic and institutional barriers and a system requiring cultural and economic capital that an individual holds to navigate successfully. As Latinx students make generational leaps in navigating higher education, using this study, we can help improve their college experience and, ultimately, students' degree attainment.

3.9 Appendix

Survey A3. Undergraduate Student College Transition and Adjustment Survey

College Satisfaction

1. Please rate your satisfaction with the following statements based on your experiences at (name of university): (Scale: 0-Not at all Satisfied, 1-Dissatisfied, 2-Satisfied, 3-Very Satisfied).
 - a) The courses I have taken on campus have enriched my perspectives.
 - b) The campus community is an intellectually stimulating place to be.
 - c) Sense of belonging in classes at (name of university).
 - d) Sense of community on campus.
 - e) Sense of being able to advocate for yourself.
 - f) Student services address students' needs.
 - g) Academic advising.
 - h) Student housing.
 - i) Food security.
 - j) Financial aid services.
 - k) Positive interactions with faculty.
 - l) Positive interactions contact with Graduate Teaching Instructors (GSI).
 - m) Positive interactions with other students.
 - n) The ethnic and racial diversity of the faculty.
 - o) The ethnic and racial diversity of the administration and staff.

Student Agency

2. Please rate how familiar you are with the following offices on campus: (Scale: 0-Not Familiar, 1-Somewhat Familiar, 2-Familiar, 3-Very Familiar)
 - a) Disabled Student's Program (DSP)
 - b) The Transfer Student Center
3. If you self-identify as a student with a disability, how often do you use the resources from the Disabled Student's Program (DSP)?"

- a) No, I am not a student with a disability.
 - b) Never
 - c) Occasionally
 - d) Often
 - e) Very Often
 - f) I prefer not to answer
4. If you self-identify as a transfer student, how often do you use the resources the Transfer Student Center offers?
- a) No, I am not a transfer student.
 - b) Never
 - c) Occasionally
 - d) Often
 - e) Very Often
 - f) I prefer not to answer

Equity

5. Please rate the following statements (Scale: 0-Disagree Strongly, 1-Disagree Somewhat, 2-Agree Somewhat, 3-Agree Strongly, 4-Does not apply)
- a) As a first-generation student, I face institutional barriers limiting my ability to succeed.
 - b) As a first-generation student, (name of university) provides me with the resources and/or support programs I need to navigate higher education.
 - c) As a student with a disability, I face institutional barriers limiting my ability to succeed.
 - d) As a student with a disability, (name of university) provides me with the resources and/or support programs I need to navigate higher education.
 - e) As a transfer student, I face institutional barriers limiting my ability to succeed.
 - f) As a transfer student, (name of university) provides me with the resources and/or support programs I need to navigate higher education.

Demographic Information

6. What is your current age?
7. Gender
 - a) Female
 - b) Male
 - c) Transgender
 - d) Non-binary/non-conforming
 - e) Prefer not to answer
 - f) Other
8. Which of the following do you identify with?
 - a) Asian
 - b) Black or African American
 - c) Hispanic/Latina(o)(e)(x)
 - d) Indigenous/Native/American Indian
 - e) Middle Eastern or North African (MENA)
 - f) Native Hawaiian or Pacific Islander
 - g) White or Caucasian (non-Hispanic)
 - h) Some Other Race, please specify:
 - i) Prefer not to answer
9. What is your best estimate of your parent's household income last year?
 - a) Less than \$20,000
 - b) \$20,000 to \$39,999
 - c) \$40,000 to \$59,999
 - d) \$60,000 to \$79,999
 - e) \$80,000 to \$149,999
 - f) \$150,000 to 199,999
 - g) \$200,000 or more
10. Are you a first-generation college student (the first in your family to attend college)?
 - a) Yes

- b) No
 - c) Do not know
11. Do you identify as a student with a disability?”
- a) Yes
 - b) No
12. Do you identify as a Veteran student?
- a) Yes
 - b) No
13. Do you identify as a student parent? (e.g., a student who has dependents)
- a) Yes
 - b) No
14. Are you a transfer student?
- a) Yes
 - b) No
15. If you answer YES, to question 31, where did you transfer from?
- a) Community college
 - b) Another university
16. If you answered YES, to question 31, please list the last term/semester and year you attended community college. (Open-ended)
17. If you answered YES, to question 31, please list the semester and year you transferred to (name of university): (Open-ended)
18. If you answer NO, to question 31, please list the semester and year you started at (name of university): (Open-ended)
19. How many semesters have you completed at (name of university)? Note: this also includes summer semesters and the current semester Spring of 2023. (e.g., If you started attending (name of university) in **Fall 2022**, you will list **2** [fall 2022 and spring 2023]) (Open-ended)
20. What is your declared major? **Note:** If you are a double major, please list both majors. (Open-ended)

21. Since attending (name of university), have you changed majors?
 - a) Yes
 - b) No, and I do not plan to change majors
 - c) No, but I plan to change majors
22. If you answer yes, to question 38, please list your previous major: (Open-ended)
23. If you changed majors, why did you change your major? (Open-ended)
24. What year in your undergraduate program are you?
 - a) First year
 - b) Second year
 - c) Third year
 - d) Fourth year
 - e) Fifth year
 - f) Sixth year
 - g) Seventh or higher
25. How many credits/units have you completed so far at (name of university)? (Including spring 2023)(Open-ended)
26. What is your current (name of university) grade point average (GPA)
 - a) 3.50 to 4.0
 - b) 3.0 to 3.49
 - c) 2.50 to 2.99
 - d) 2 to 2.49
 - e) Less than 1.99
27. What was your high school grade point average (GPA)?
 - a) 3.50 to 4.0
 - b) 3.0 to 3.49
 - c) 2.50 to 2.99
 - d) 2 to 2.49
 - e) Less than 1.99
28. What was your transfer grade point average (GPA) as a transfer student?

- a) 3.50 to 4.0
- b) 3.0 to 3.49
- c) 2.50 to 2.99
- d) 2 to 2.49
- e) Less than 1.99

29. On average, how many hours per week do you work in exchange for paid wages?

- a) 0, I don't have a job
- b) 1 to 10 hours
- c) 11 to 15 hours
- d) 16 to 20 hours
- e) 21 to 30 hours
- f) 31 to 40 hours
- g) More than 40 hours

Test citation (Zamani-Gallaher, 2017) Test citation with page (Zamani-Gallaher, 2017, p. 9)

Majors	Frequency	Percentage
Business Administration	1	1
English	1	1
Global Studies and Political Economy	1	1
Integrative Biology	1	1
Molecular and Cellular Biology	1	1
Nutritional Sciences	1	1
Public Policy	1	1
Spanish	1	1
Applied Mathematics	2	3
Chemical Engineering	2	3
Data Science	2	3
Society and Environment	3	4
Chicana/o and Latino Studies	4	6
Media Studies	4	6
Legal Studies	4	6
Ethnic Studies	5	7
Psychology	5	7
Social welfare	5	7
Sociology	10	14
Political Science	11	16
Undeclared	2	3
Missing	2	3

Table C9: Descriptive Table of Students' Majors

Conclusion

These three studies contribute to the conversation around access and equity in higher education. Currently, the structure of higher education makes it difficult to access, navigate, and succeed for many students from historically marginalized backgrounds. Structural barriers include but are not limited to tuition fees, limited financial aid, inadequate support services, lack of representation among faculty and peers, and language barriers. At the institutional level, I analyze institutions' characteristics (size and location) associated with higher associate degree attainment using fourteen years for all U.S. two-year institutions. At the student level, I developed and validated the Undergraduate Student College Adjustment Instrument that holistically measures students' college adjustment incorporating five domains: academic belonging, student agency, community, faculty and academic advisor support, and equity. At the student level, I also developed a new approach to examining Latinx college satisfaction for transfer students compared to their non-transfer peers attending an elite four-year institution. Below, I expand on each paper's findings connected with existing literature and describe limitations, implications, and recommendations for future research based on pending questions.

Study 1

In the first paper, I examined the association between associate degree attainment and two-year institutions' characteristics (location and size) employing hierarchical linear modeling (HLM). This study contributes to the literature by examining fourteen years of data from 2002-2003 to 2015-2016 for all two-year institutions in the U.S. In addition, this research contributes to the literature by providing a more accurate relationship at the institution and state level. Employing HLM is essential for using a longitudinal dataset with three levels of data and two levels of data nesting, yearly observations within a particular two-year institution, and within the state where the institution is located. Using HLM allows us to differentiate between state variance in the associate degree attainment across all two-year institutions and within-state variance for each institution. This study demonstrates that, on average, more students who attend small-rural and medium-rural institutions attain associate degrees than students who attend suburban and urban two-year institutions. Consistent with the literature on rural two-year institutions, Yang and Venezia (2020) research also found the same patterns, that rural two-year institutions had higher associate degree attainment than suburban and urban two-year institutions over three- and six-year periods. There are differences in enrollment patterns in two-year institutions by race. African American students constitute the largest minority group in rural two-year institutions, whereas Latinx students constitute the largest minority group in suburban and urban two-year institutions (Hardy & Katsinas, 2007).

This study demonstrates the association between rural small and medium two-year institutions and associate degree attainment. Future research can examine additional institutional characteristics associated with degree attainment for rural small and medium

institutions. For practitioners and administrators, it is crucial to investigate further the characteristics of these institutions that foster students' success measured by degree attainment and which characteristics from suburban and urban two-year institutions can be mirrored to achieve a higher degree attainment. A limitation of this study is the analysis timeframe. This study was conducted using data from 2002 to 2015. Future studies can focus on analyzing recent data from 2015 to 2024, examining if associate degree attainment patterns for two-year institutional characteristics remain the same across time. In addition, tribal two-year institutions were not added to the sample. Future research can examine the association of degree attainment and institutional characteristics (location and size) for tribal two-year institutions.

Study 2

In the second paper, I developed and validated an instrument using item response theory to examine students' adjustment to college campuses. Overall, the instrument is reliable for measuring students' adjustment levels; results showed that students' adjustment levels change throughout academic years. Asian students had higher levels of adjustment, followed by White and Latinx students. Building on previous instruments from the literature, the main contribution of this study is the development and validation of a new instrument to measure students' college adjustment at an elite public institution using a comprehensive approach by incorporating five domains: academic belonging, student agency, community, faculty and academic advisor support, and equity. Findings show that the instrument is valid for measuring students' college adjustment. Regarding students' adjustment levels changing through academic years, traditional work on students' college adjustment has examined first-year college adjustment (Baker & Siryk, 1984; Swenson et al., 2008). A longitudinal study by Rice (1992) examined the change in parent individuation from freshman to junior year. Results showed an increase in parent individuation across time. This study expands on the literature by examining college adjustment across academic years. However, a limitation of the study is that data collection was done at a one-time point. Future research using a longitudinal component can explore students' college adjustment change over time for the same group of students. Additionally, open-ended questions can be added to the study to examine why students' adjustment levels fluctuate across academic years.

When examining college adjustment by race, Asian students had higher levels of college adjustment, followed by their White and Latinx peers. This finding is consistent with the literature regarding White students having higher levels of adjustment than Latinx students. For example, in a meta-analysis of sixteen studies, Quintana et al. (1991) found that Latinx students had experienced a significantly greater amount of stress measured by academic, financial, personal, and social isolation than their White peers. Future studies can expand on the differences in college adjustment between Asian, White, and Latinx students. For example, the research could examine each college adjustment domain individually to see if there are some domains where students have similar or different adjustment levels. Admin-

istrators can use findings from this study to focus on how they can work to increase Latinx college adjustment, which is an essential element for students' degree attainment.

Study 3

The third paper examined differences in college satisfaction between transfer and non-transfer Latinx students after controlling for students' characteristics. It analyzed the association between college adjustment and college satisfaction for Latinx students. A contribution of this study is examining the experiences of Latinx college students attending selective elite public four-year institutions. First, results indicated that Latinx transfer students do not differ in college satisfaction from their non-transfer Latinx counterparts. This is consistent with Woosley and Johnson's (2006) findings at the academic level for transfer and non-transfer students. However, one would expect this finding to be different and that students' adjustment differ by transfer status because transfer students experience a *transfer and cultural shock* during their first and second semesters (Laanan, 1995; Wawrzynski & Sedlacek, 2003). One general explanation can be that both groups of students' college experiences are shaped and constrained by a system of inequality, impacting both groups equally. On the other hand, both groups can also benefit from targeted programming the university provides to Latinx students. Additional research can explore access to and take-up of programming and resources for students to fully understand the differences and similarities between transfer and non-transfer Latinx students.

A second finding showed a positive association between college adjustment and college satisfaction when examined by its components: academic and community satisfaction and students' well-being and resource satisfaction. As well as when examined by aggregating its three components. These findings are consistent with previous literature that examined student college adjustment and college satisfaction associated with academic and community belonging, student well-being, and student resources (Bettinger & Baker, 2014; Wolniak et al., 2012; T. J. Yosso & Solorzano, 2006). Lastly, consistent with the literature, this study found that Latinx first-generation students had lower levels of college satisfaction than their non-first-generation Latinx peers (Gillen-O'Neel, 2021; Hertel, 2002). As we work towards increasing degree attainment for Latinx first-generation students, this study has implications for university administrators to improve Latinx college satisfaction because it is associated with students' retention and degree attainment. Future research can examine Latinx college satisfaction at other elite public four-year institutions to see if the results of student experiences are the same or differ. Additionally, with a larger sample size, a more in-depth analysis can be conducted to explore Latinx college satisfaction by majors. Particularly, it could examine STEM students versus students in social sciences.

In summary, these three studies contribute to our understanding of factors associated with degree attainment for two-year institutions, college adjustment, and college satisfaction among undergraduate students, particularly Latinx transfer students attending elite public four-year institutions. The first study highlights the significance of rural small- and medium-sized two-year institutions on degree attainment. Further research can be done

to explore additional institutional characteristics associated with degree attainment. The second study introduces a new instrument to measure undergraduate college adjustment, revealing differences in adjustment levels among racial groups and underscoring the importance of addressing Latinx students' college adjustment to increase degree attainment. Lastly, the third study focuses on the experiences of Latinx transfer and non-transfer students, showing the positive association between college adjustment and satisfaction, particularly for first-generation Latinx students with statistically significant lower levels than their non-transfer Latinx peers. These findings collectively emphasize the importance of tailored support mechanisms within institutions to improve the academic journey and degree attainment for Latinx students. Future research is needed to explore additional institutional characteristics, longitudinal adjustment levels, and the lived experiences of Latinx students across academic majors and institutional contexts.

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