



Article

How Female Undergraduate Students' Holistic Experiences Predict Their Payment Methods

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Abstract: Female undergraduate students have drastically increased in higher education over the last three decades. The increase in the number of students has come during unprecedented cost increases associated with attending a four-year higher education institution. The increases can be related to tuition but are also associated with mandatory fees (fees all students must pay regardless of status). These fees are associated with programs and services that enhance the collegiate experience (academic tutoring, health services, and Game Day activities). Conversely, little is known concerning how holistic experiences (prior experiences) can shape payment methods. Through a quantitative survey analysis that collected female participants' self-reported data on payment methods across four states, we employed a regression analysis to predict their payment methods. Our findings suggest the (a) demographic characteristics, (b) university knowledge, (c) knowledge and attitudes toward mandatory fees, and (d) several academic capital subsets that shape women's payment methods.

Keywords: mandatory fees; payment methods; higher education; academic capital; gender; college students



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1. Introduction

Tuition and fees continue to increase as public institutions of higher education (PIHEs) try to lessen the financial burden due to losses in state support. As PIHEs adopt more neoliberal ideologies (i.e., students as customers), costs once absorbed by institutions shift to students [1,2]. In 2020–2021, the average cost at a PIHE was 2.78 times more than 30 years prior [3]. Similarly, the average out-of-state cost rose 112% from 1990 to 2019, from USD 4745.79 to USD 16,935 [4]. The increases are not solely in tuition; studies have found significant increases in fee costs [5,6]. Wang [7] noted that institutional administrators favor increasing fees as a strategy because students accept fee increases more readily than tuition increases. However, there have been several lawsuits since the start of the global health pandemic, COVID-19, demanding that institutions of higher education refund student fees due to inability to access on-campus resources or housing. Most institutions did not refund students then [8].

As more first-generation (i.e., first in the family to graduate from a 4-year higher education institution in the United States; [9]) and historically excluded students enroll, PIHEs are investigating alternative revenue methods to attract more affluent students who will pay more for *amenities* than their high-achieving peers, who are more willing to pay for increased academic quality [10]. Because the burden of these costs has shifted to students, there is a lack of empirical research to understand how students' prior and current knowledge and attitudes toward mandatory fees and academic capital influence student payment methods—specifically, related to gender for undergraduate students who identify as women. Women represent 56% of the enrollment in universities and colleges [11] and carry 58% of student loan debt [12]. When investigating the interaction of gender and

race/ethnicity, we found that Black women, after 12 years of repayment, still owe, on average, 13% more than they borrowed [13].

The increase in the number of women in postsecondary education is due to increased professional opportunities [14]. Because payment methods differ by race and ethnicity [15], a more in-depth investigation is needed to understand how varying student identity groups use payment methods to afford their collegiate degrees.

This inquiry is part of a more extensive study on undergraduate students and their knowledge and attitudes toward mandatory fees, academic capital, and the relationship between their payment methods. Academic capital can be operationalized as “the social processes that build family knowledge of educational and career options and support navigation through educational systems and professional organizations” [16,17]. Subsequent studies focused on student behavior as it relates to their engagement by race and ethnicity. Although our analysis and findings in this article focus on all female students, we found that payment methods differ the most for Black women. This finding supports current research that indicates that historically marginalized women typically carry more debt than their white peers [18]. However, little is known about whether knowledge and attitudes toward mandatory fees or the holistic experiences of female undergraduate students influence the amount of debt incurred during enrollment.

Data for this article focus explicitly on women-identifying participants at four 4-year PIHEs. Few studies have focused on how knowledge and attitudes toward mandatory fees and academic capital influence student behavior and payment methods [15,19]. Some empirical studies have focused on payment methods, e.g., [20–22]. However, these studies lack a gender-specific analysis of how holistic experiences and knowledge influence payment methods. Students’ diverse experiences can influence their social, cultural, and academic capital [23,24]. The level of capital may be different for all students and changes their exposure to knowledgeable individuals or access to information to help pay for their education. There has been a shift in demographic trends in recent decades, with more women enrolled in higher education than men [11]; however, women have not historically had the same access to resources (e.g., fem/mentors and financial resources) as men. The shifts resulted in a new demographic in higher education across our nation, which has had little experience with postsecondary education. We imply that low levels of knowledge and academic capital are not deficiencies and that these low levels are indicative of patriarchal systems. PIHEs must help scaffold students in these systems to promote their success. As a result, our implications can inform institutional policy on how female students finance their higher education degrees and help institutional administrators provide the support that can connect resources to these students. Thus, the following research questions guide this study:

1. To what extent do female undergraduate students’ knowledge of and attitudes toward mandatory fees, academic capital, and university knowledge of financial structures predict payment methods?
2. Do racial differences in female undergraduate students’ university knowledge of financial structures, knowledge of and attitudes toward mandatory fees, and academic capital predict their payment methods?

2. Conceptual Framework

Considering the lack of existing published empirical research on this topic, we drew from multiple interdisciplinary scholarships (i.e., social psychology, social and cultural capital theory) and organizational studies to conceptualize the relationships between knowledge of and attitudes toward mandatory fees, university knowledge of financial structures, and their payment methods. First, we conceptualized students’ knowledge through Bourdieu’s [23–25] social and cultural capital theory and Winkler and Sriram’s [17] academic capital framework.

2.1. Social and Cultural Capital

Bourdieu [23] conceptualized social and cultural capital as different forms and as providing an unwritten currency to individuals with them. Social capital can be viewed as the aggregate of the potential resources connected through a network of relationships. In contrast, cultural capital was identified as the knowledge, behaviors, and skills individuals hold by membership or access to a specific social group—often passed down from generation to generation—which ultimately assist with upward mobility. Bourdieu [23] described three types of cultural capital: (a) embodied (i.e., socialization and education, which is reflected in mannerisms and skillsets acquired), (b) institutionalized (i.e., certifiable and measurable items such as job rankings and college degrees possessed), and (c) objectified (i.e., material things possessed that showcase one's position in society).

Students have different lived experiences, which influences how they engage and have knowledge of PIHEs. According to Bourdieu [23], social capital is the credential that provides access to or membership status into a particular group. Likewise, cultural capital embodies those credentials that validate social mobility for individuals [24]. Existing research studies have identified how social capital (i.e., awareness and ability to find support) supports holistic student success (refer to [26,27]). Access to or the ability to identify support, or lack thereof, may influence student behavior concerning the choices they make to pay for their education due to limited exposure to higher education systems and not having a network of knowledgeable individuals to help make informed decisions [16,28]. When paired together, social and cultural capital allows for an adaptable framework that provides context and understanding of the systemic inequities in society.

Moreover, social and cultural capital help higher education institutional actors better understand students who are first-generation and from low socioeconomic status backgrounds and may have different social and cultural capital than their peers with greater access to knowledgeable people, resources, and other opportunities (e.g., networking). Furthermore, social and cultural capital are forerunners to academic capital as higher education actors must focus on how students engage with or come to know how to access college and networks of knowledgeable individuals (e.g., high school guidance counselors, admissions representatives, and family members). Additionally, it is essential to consider how some students gain entrance to resources not often afforded to or easily accessible to other groups (e.g., paid internships, financial support, and mentorship). Students' differences in knowledge of higher education can influence behaviors as these students may not be aware of symbols on campus and traditional academic norms, making it hard to identify if they are being represented or not, e.g., [29–31] including knowledge and attitudes toward mandatory fees and academic capital shape students' behavior in fee supported services [19]. Next, we hypothesized attitudes could influence students' feelings. Preexisting personal attitudes can shape perceptions of new events and create feelings that reflect preexisting attitudes [32]—if students have preexisting negative attitudes toward fees, they will have a negative feeling each time they pay their tuition and fees.

2.2. Academic Capital

The inception of academic capital was initially developed by St. John et al. [16] with roots in human capital theory [31], social capital theory [23], and social reproduction theory [24]. The theory describes the social processes that build knowledge of educational and career options and support by navigating educational institutions [16]. The aforementioned theories led St. John et al. [16] to theorize and develop a survey centering on how students from a low-income background enter higher education while understanding what obstacles they must overcome to gain admission. Academic capital supports how students develop social processes that help increase knowledge and access and support students entering higher education.

The theory does have merit in the post-enrollment setting; thus, Winkler and Sriram [17] adopted the theory for higher education students. The theory was adapted to change the foci from high school students entering postsecondary institutions to students

currently enrolled at a university or college. The aforementioned researchers used the theory to further develop and refine St. John et al.'s [16] survey measurement instrument, which included eight subscales (see Table 1) that aligned with human, social, and cultural capital for students enrolled in higher education. This model provides a better understanding of the funding support students need, the information they acquire, and how they understand their educational costs. These areas assist with identifying how these complexities can shape student behavior in terms of their payment methods. Winkler [33] and Ikegwuonu [19] validated the instrument in their studies to understand the holistic experiences of students. Winkler [33] completed a psychometric analysis that quantified academic capital in college students. In addition, their analysis added two new components that aided in understanding how students acquire knowledge, navigate higher education, and the necessary support needed to access an institution of higher education. The six components of academic capital identified by St. John et al. [16] and the two additional new components of academic capital were validated through a principal component analysis (PCA; see Table 1). Ikegwuonu [19] completed an exploratory (EFA) and confirmatory factor analysis (CFA) with modified questions regarding financial structures and information related to their attendance at their university while using the eight academic capital subscales. The Cronbach's alpha scores from the research investigation ranged from 0.72 to 0.89 for all constructs in the study. Both instruments used advanced psychometric measurements to ensure content validity, construct validity, and reliability were met.

Table 1. Academic capital subscales.

| | |
|-------------------------|---|
| Navigation of systems | Students' abilities to access and utilize support programs within their institution |
| Family uplift | Students' desire to achieve more, both in life more broadly and in education, than previous family members |
| Supportive networks | Access to supportive people and networks outside their institutions of higher education |
| Concern about costs | Students' concerns with having the financial resources to matriculate through their institutions of higher education |
| Trustworthy information | Students' trust toward information related to their education that comes from within their institution |
| Overcoming barriers | The ability to overcome obstacles that can hinder their success/persistence at their institutions of higher education |
| Familial expectations | The expectation that the student will or will not pursue a formal postsecondary education |
| College knowledge | Students' access to general knowledge about college from people within their own network and lives |

Winkler (2013) [33].

Furthermore, academic capital conceptualizes how support networks, access to trustworthy information, and access to a peer group can impact students. Like attitudes toward fees, students' academic capital can shape their perceptions of events, increase their knowledge, and create positive attitudes. Hence, students with higher academic capital may choose different methods for paying for their education each semester. We recognize that social, cultural, and academic capital is rooted in theories that remove the human experience for many historically excluded communities.

We acknowledge that human capital theory can be viewed from the lens of labor equals production. Also, we would be remiss not to recognize Yosso's [34] community cultural wealth model, which addresses the diverse strengths and assets racially minoritized students possess and bring with them into higher education spaces. However, for the context of this study, we investigated how systems of education remove marginalized communities through relationships developed prior to college enrollment. The "messiness" of the student experience prior to and while enrolled may influence how students engage and have knowledge of PIHEs. It can leave students struggling to find knowledgeable individuals who understand the institutional environment and have access to resources.

Further, students entering PIHEs from diverse backgrounds may need more knowledge and understanding of complex higher education structures [35]. Academic capital theory, which includes social and capital, encompasses students' past experiences and how these experiences can help provide students with opportunities while enrolled at a higher education institution. Students who lack exposure to these stratiform societal systems of networks before enrollment can influence how students engage with resources and build successful networks on campus. This can manifest in ways students with high academic capital use relationships to gain access to institutional grants and scholarships at higher rates than students who have different networks or knowledge. These interactions can adversely affect how students fund their education (e.g., taking out excessive loans) or the ability to find additional resources to alleviate the financial burden put on them.

3. Literature Review

The following literature review focuses on (a) higher education institutions' adaption of neoliberal ideologies and the shifting policies that shape the student experience, (b) the history and use of mandatory fees at PIHE, and (c) students' perception of costs.

3.1. Neoliberalism in Institutional Behavior

As a result of public opinion shifting over the last two decades, PIHE now emphasized adopting neoliberal, *free-market* ideologies that reduce state support and place the burden of costs on students and their parents, caretakers, or guardians [2]. In this study, we refer to neoliberalism, or neoliberal ideology, which includes cost recovery, entrepreneurialism, accountability, and managerialism [36]. Several empirical studies have identified how higher education institutions use entrepreneurialism, corporate accountability, and cost recovery in the college and university setting [37–39]. Conversely, these investigations focused on managerialism in higher education related to corporate cost-cutting and the commercialization of higher education [40–42], which has resulted from the reduction of state allocation of financial resources and increased educational expenditures. Because of these shifts, institutions have adopted diverse budgeting strategies to generate revenue and close the gap in lost state support [6,43]. Thus, students from low-income backgrounds experience sticker shock as they must familiarize themselves with the net cost of attendance. Further, institutions adopting different budgeting strategies can add additional costs after enrollment [44,45]. These shifts occur from semester to semester and can impact students in real time while enrolled at their higher education institution.

The literature has shown that mandatory fees were initially employed to garner additional money when higher education institutions relied heavily on wealthy benefactors and donations to stay financially solvent [46]. However, this is not a sustainable model. If one wealthy benefactor withholds their donation, the institution could become financially insolvent [47]. After World War I, institutions began to implement student activity fees, which led to several court cases [48,49] that established how fee revenue could be spent and what it supported. Eventually, fees began to be used to support staff salaries [50], amenities [10,51], and as a method to recoup lost revenue during the 2007–2008 economic recession [6].

3.2. Student Perception and the Transparency of Costs

It can be difficult for the average student in the United States to understand the costs associated with higher education. Ikenberry and Hartle [52] found that 56% of surveyed participants stated they know "a lot or a good amount" (The authors did not contextualize what they meant regarding "a lot or a good amount") (p. 8) about college costs. However, participants overestimated the average cost of attendance at public 4-year institutions by 212%, and 99% miscalculated the total cost of attendance [52]. To explain the differences, scholars have used a nexus model approach [53], which examines how finances relate to college experiences and persistence and how financial expectations, actual prices, and subsidies influence persistence. Several research investigations found that

African American and Latinx students' college aspirations are impeded at a higher rate than their white peers due to the complexity of information about college costs and financial aid [54–58]. Many researchers [59–61] considered access to an institution and financial information to be essential in matriculation and persistence. Specifically, it is not only access to information but also how information should be relevant to the student group [62]. For example, Grodsky and Jones [63] suggested parents often overestimate their children's attendance cost because they base their assumptions/opinions on subjective knowledge, not evidence-based information. Also, limited access to information often results in these students figuring out methods of paying for their education on their own.

Furthermore, Paulsen and St. John [64] found that tuition and financial aid indirectly and directly influence college choice and are shaped by students' social class and gender. Moreover, the authors above found that low-income and working-class students are more sensitive to price increases. These students usually subsidize their cost of living through loans. Loans impact all student groups; however, more students from working-class and low-income backgrounds stop out or drop out due to increased education costs. These findings showcase that women hold two-thirds of the student loan debt in the United States [65] and take out more loans than their male counterparts [66]. In addition, we found that Black women owe more student loan debt after 1 year of enrollment than any other group [65].

Although some existing investigations center on payment behavior and payment methods in higher education [67–69] and how graduate students navigate their degrees and manage their costs [70–73], few of these studies are situated in the U.S. context, are based on the undergraduate experience, or use economic theories to describe behavior as a function of ones' belief in obtaining their goal. Moreover, there is a deficiency of research centered on students' knowledge and attitudes toward mandatory fees, academic capital, and their feelings when they pay tuition and fees as factors in shaping students' payment methods to cover education costs. More specifically, there is a lack of focus on female students as the unit of analysis.

4. Methodology

4.1. Measures

In this research study, we employed the Students' Knowledge Attitudes of Fees and their Engagement (SKAFE; [19]) survey. The SKAFE instrument measures students' knowledge of and attitudes toward mandatory fees, academic capital, and their feelings when paying their tuition and fees. The instrument measures students' knowledge in three parts: (a) their self-perceived knowledge of a service or activity, (b) their self-perceived knowledge of the overall financial structures of the institution (i.e., tuition, state support, corporate partnerships, and public-private partnerships), and (c) the actual knowledge (correct true or false definition of fees). Attitudes measurement consists of the perceptions of a given mandatory fee on a 4-point Likert scale (1 = *Strongly disagree* to 4 = *Strongly agree*). As previously stated, Winkler and Sriram [17] further developed St. John et al.'s [16] measurement instrument to include *navigating of system, family uplift, supportive networks, concerns about costs, trustworthy information, overcoming barriers, familial expectations, and college knowledge* for the collegiate setting (see Table 1 for definitions of academic capital).

Similarly to the attitudes scale, the academic capital scale used a 4-point Likert scale. Finally, we operationalized student payment by students self-reporting the amount and type of aid they received (e.g., loans (We define loans as money that must be repaid and typically incurs interest), grants (We define grants as gift assistance awarded to qualified undergraduate students demonstrating exceptional financial need. Grants do not need to be repaid), and scholarships (We define scholarship as an award of financial aid for a student to further their education. These awards do not have to be repaid and are different from grants)) in ordinal data intervals based on amounts from student feedback during the pilot study. The survey was piloted and included an exploratory and confirmatory factor analysis on the SKAFE instrument. Also, all assumptions of logistic regression were met,

including tests for multicollinearity using variation inflation factors, P-P plot, and checking for homoscedasticity.

4.2. Sampling Strategy

The SKAFE survey was administered at four large public system institutions in various states (i.e., Georgia, Arizona, and two large system institutions, including California). The system state schools represent several institutions that qualify as minority-serving institutions (e.g., Asian American and Native American Pacific Islander serving, Historically Black College of Universities, Hispanic Serving, and Predominantly Black). The institutions varied in student enrollment, research production, and geographic location. To be eligible for the study, students had to be enrolled full-time in in-person classes, not online, and be 18 or older. The data collection process was from January 2020 to March 2022. The researchers employed a multi-stage sampling strategy because they could not access class lists. As a result, we focused our recruitment communication on faculty teaching courses that satisfy general course requirements (e.g., introduction to Sociology and Psychology) to get a cross-section of students enrolled at the specific institution. The researchers “scraped” (the process of collecting emails from institutional web pages) faculty emails from university websites. We sent out repeated communications and, when permitted, attended courses to recruit students during class. In conjunction with emailing faculty and recruiting students via classes, we emailed special listservs that included fraternity and sorority life and registered student organizations and completed an additional internal review board process for student-athletes (although student-athletes are in the sample, many receive either partial or no support). The recruiting process included the oversampling of students from historically marginalized communities. To increase the number of students in these groups, we targeted student organizations and advisors who interacted closely with these student groups (e.g., Black Student Union and Latinx Student Union).

Further, we included a confirmatory factor analysis to survey the fit of the SKAFE instrument to the sample. We employed a maximum likelihood estimation with robust standard errors, which is robust to issues of non-independent, normality, and complex data samples [74], with an oblique rotation (see Appendix A). In addition, we included the r-squared values and standard errors for the factors (see Appendix B) followed by Cronbach’s alpha scores (see Appendix C) to measure internal consistency with the measurement instrument. All scores (i.e., Cronbach’s alpha scores for constructs ranged from 0.70 to 0.89) are above the recommended threshold (0.70 to 0.90) [75]. The dataset included 652 observations from students who attended institutions in Georgia, Arizona, and California. In addition, to incentivize the completion of the surveys, the first 350 participants received a gift card to increase responses. The sample was primarily white students (49%, $n = 322$) in their second year (25%, $n = 169$) and majoring in biology (33%, $n = 218$).

We acknowledge that the California higher education system has funding systems that differ from most U.S. postsecondary institutions. Specifically, the funding allocation model per student and the financial aid models are unique within the U.S. higher education system. However, these institutions enroll a significant number of historically racially minoritized students in their universities. The sample does not reflect the student body of the institutions represented in the sample (e.g., race, gender, and student year); however, our findings may add to the literature.

4.3. Data Analysis

To address the research investigation, we chose ordinal regression with odds ratios to answer the first and second research questions. However, ordinal regression is only possible if the model passes the proportional odds assumption test. Therefore, we employed a multinomial regression with relative risk ratios if the model does not pass the proportional odds assumption test. Multinomial regression is less strict than ordinal regression and provides a more nuanced understanding of the data [76]. All models’ covariates included major, Pell Grant recipient status, and first-generation status. In addition, we completed

a pairwise comparison of means with a Bonferroni correction to identify differences in attitudes toward knowledge of mandatory fees and students' understanding of university financial structures. The models did not include the student's class year as there were too many missing observations in this variable. Furthermore, we included an interaction variable in the model between ethnicity, attitudes toward and knowledge of mandatory fees, and university knowledge of financial structures. For each payment method, participants reported receiving and using loans and scholarships in the following amounts: \$0 (i.e., I do not receive scholarships), \$500–1500, \$1501–3500, \$3501–5500, or above \$5500 and grants of \$0 (i.e., I do not receive grants), \$500–700, \$701–900, \$901–1000, \$1001–2000, or above \$2000. The \$0 amounts were the reference group for the payment methods for the multinomial regression models for the relative risk ratios. The reference group for the second and third research questions was the Asian category. The grant, scholarship, and loan amount categories were based on the results from the pilot study sample and student feedback.

5. Results

When reviewing the descriptive statistics from the student respondents, we find that students overall have positive attitudes toward services and activities that are supported by mandatory fee revenue. However, student perceptions toward their knowledge of mandatory fees differed slightly. The findings suggest that students agreed that they felt knowledgeable of what the fee revenue supports; however, we have similar amounts of students who disagreed with the same sentiment. For example, students felt certain that they knew what the facilities fee supports (34%, $n = 221$ agree and 32%, $n = 208$ disagree). We find this trend with services supporting athletic, student services, and recreation fees. When analyzing the student responses by individual state system using the pairwise comparison with the Bonferroni correction, we identified differences between students' university knowledge, attitudes toward and knowledge of mandatory fees. Students' perceptions of knowledge changed based on the system, even with systems within the same state (see Appendices D–F for complete details).

When analyzing the amount of aid students receive, we identified that over 40% ($n = 262$) of the sample did not receive a grant, and 53% ($n = 347$) did not receive loans. Conversely, we find that 72.1% ($n = 470$) of the sample received some scholarship from their institution. When disaggregating the data by race/ethnicity and payment methods, we identified that Black students were the largest group, per their sample size, to have received a grant from their institution (72%, $n = 71$). Moreover, we find that all student groups reported having earned scholarships compared with students who reported not earning scholarships from their respective institutions. Finally, when reviewing the loan data, a higher percentage of Asian (82%, $n = 57$) and Latinx (54%, $n = 58$) students did not take loans to fund their education.

To what extent do female undergraduate students' knowledge of and attitudes toward mandatory fees, academic capital, and university knowledge of financial structures predict payment methods?

Grants

In our logistical regression analysis (refer to Appendix G), we find that female students who had higher scores in *overcoming barriers* ($RRR = 1.68, p < 0.05$) had statistically significant relationships with grants in the \$500–\$700 range. Students with higher scores in *college knowledge* ($RRR = 0.56, p < 0.05$) received grants in the \$701–\$900 range. Similarly, we find students with more *university knowledge of financial structures* ($RRR = 0.92, p < 0.05$) were more likely to receive grants in the \$901–\$1000 range. Finally, we found statistically significant relationships between students with *knowledge of mandatory fees* ($RRR = 1.35, p < 0.05$) and *university knowledge of financial structures* ($RRR = 1.08, p < 0.05$) and receiving grants in the highest interval (above \$2000).

Additionally, in the analysis with the interaction term (race/ethnicity and knowledge of mandatory fees), we find that there was a statistically significant relationship between

students who identify as multiracial and knowledge (RRR = 4.43, $p < 0.05$) and receiving grants in the \$1001–\$2000 range. Similarly, we find a statistically significant relationship with students who identify as white (RRR = 3.89, $p < 0.05$) who receive grants in the \$701–\$900 range.

Scholarships

Unlike grants, we identified several of the variables in the model to have statistically significant relationships with our independent variables across scholarship ranges (refer to Appendix H). Specifically, we find that *navigation of systems* (RRR = 1.62, $p < 0.05$), *overcoming barriers* (RRR = 1.45, $p < 0.05$), *college knowledge* (RRR = 0.66, $p < 0.05$), and *university knowledge of financial structures* (RRR = 0.94, $p < 0.05$) increased the odds of receiving a scholarship ranging between \$500 and 1500. Likewise, we identified students with increases in *college knowledge* (RRR = 0.72, $p < 0.05$) who received scholarships in the \$1501–\$3500 range and students with increases in *navigation of systems* (RRR = 1.52, $p < 0.05$) in the \$3501–\$5500 range. Finally, we find several statistically significant relationships in students who received scholarships in the above \$5500 range, specifically with *navigation of systems* (RRR = 1.78, $p < 0.05$), *supportive networks* (RRR = 1.56, $p < 0.05$), *familial expectations* (RRR = 0.69, $p < 0.05$), and *university knowledge financial structures* (RRR = 1.09, $p < 0.001$). Furthermore, we identified that the interaction of race/ethnicity and attitudes toward mandatory fees has a statistically significant relationship (RRR = 1.52, $p < 0.05$) in this same scholarship range.

Loans

Likewise, as for scholarships, our analysis identified more statistically significant relationships in this model (refer to Appendix I). The findings suggest that increases in *family uplift* (RRR = 0.64, $p < 0.01$), *overcoming barriers* (RRR = 1.47, $p < 0.01$), and *university of financial structures* (RRR = 0.93, $p < 0.01$) resulted in students accruing loans in the \$1501–\$3500 range. Similarly, we find statistically significant relationships between *family uplift* (RRR = 0.54, $p < 0.01$), *overcoming barriers* (RRR = 2.06, $p < 0.001$), and *knowledge of mandatory fees* (RRR = 1.38, $p < 0.05$) with students who incurred loans in the \$3501–\$5500 range. Further, we identified that there is a relationship between students who accrued debt at the highest level (e.g., above \$5500) with regard to *overcoming barriers* (RRR = 2.54, $p < 0.001$) and *attitudes toward mandatory fees* (RRR = 0.86, $p < 0.05$).

Do racial differences in female undergraduate students' university knowledge of financial structures, knowledge of and attitudes toward mandatory fees, and academic capital predict their payment methods?

Grants

In this model (refer to Appendix G), we find several intriguing relationships regarding undergraduate women, race/ethnicity, and grant attainment. First, women who identified as *Other* for their race/ethnicity were 33 times (RRR = 33.34, $p < 0.05$) more likely to receive a grant in the \$701–\$900 range, and white women were five times (RRR = 5.83, $p < 0.05$) more likely to receive a grant in the \$901–\$1000 range. In the final interval (i.e., above \$2000), we also identified a statistically significant relationship in the final interval, in which undergraduate women who identified as Native American/Alaskan Native/First Nation were 0.03 times (RRR = 0.03, $p < 0.05$) more likely to receive a grant in this range.

Scholarships

In the scholarship model (refer to Appendix H), we discovered that female students who identified as white had the only statistically significant relationship across any of the different intervals. Specifically, these students were four times (RRR = 4.55, $p < 0.01$) more likely to receive a scholarship in this model's \$1501–\$3500 range.

Loans

Conversely, to the grants and scholarship model (refer to Appendix I), we find several statistically significant relationships between race and ethnicity at different levels of loans. We chose women who identify as Asian as the reference group for the model. Women who identify as Asian typically take the least amount of loans than any other student group [12] and tend to have less student loan debt than any other student group regarding race and gender. In the analysis, we find that women who identified as white and Black were five times ($RRR = 5.36, p < 0.05$) and seven times ($RRR = 7.24, p < 0.05$) more likely to have loans in the \$500–\$1500 range. In the \$1501–\$3500 range, we identified that women who identified as white ($RRR = 5.82, p < 0.01$) and women who identified as Black ($RRR = 6.20, p < 0.01$) were five and six times more likely to take loans, respectively. When analyzing the \$3501–\$5500 range, women who identified as Black had the only statistically significant relationship and were four times ($RRR = 4.44, p < 0.05$) more likely to have loans in this amount. Finally, women who identified as white, multiracial, and Black were four times ($RRR = 4.75, p < 0.05$), six times ($RRR = 6.85, p < 0.05$), and 17 times ($RRR = 17.90, p < 0.001$) as likely to take loans in the highest amount (\$5500 and above), respectively. As the dollar amount of loans increased, Black female students were significantly more at risk of taking loans out to pay for their educational costs than women who identified as Asian or other ethnic groups.

6. Significance and Implications

The current research inquiry sought to understand how knowledge and holistic experiences can predict female undergraduates' behaviors while enrolled, specifically those related to their payment methods and the amount of knowledge related to their institution. The following is a breakdown of the findings by research question.

To what extent do female undergraduate students' knowledge of and attitudes toward mandatory fees, academic capital, and university knowledge of financial structures predict their payment methods?

The multinomial regression found that academic capital, students' knowledge of and attitudes toward mandatory fees, and university knowledge of financial structures predict students' payment methods. Moreover, as students become more aware of systems and matriculate through the institution, they are more likely to receive grants and scholarships, which supports research that suggests that greater awareness of financial options corresponds with college persistence and completion [77–79]. In addition, there were noteworthy findings on how students choose their payment methods. In the loans model, family uplift and overcoming barriers are two variables that were significant predictors of students taking the highest amount. Overcoming barriers may be an academic capital variable of interest because students may use any tool to solve the current issue without fully understanding the future implications. Also, being better than their parents or guardians can add stressors, as the drive for success can mean students use any means at their disposal. Thus, the need to solve the issue and the possibility of having pressure (e.g., family uplift) to complete their degree can result in students taking loans to ensure they graduate.

Similarly, knowledge of mandatory fees had a statistically significant relationship with loan amounts. Students who increased their knowledge of mandatory fees were willing to incur loans to complete their bachelor's education. The additional knowledge may shift the student's point of view and see the loan amount as an investment into their future to ensure they achieve their goals. Conversely, this does not reduce the influence of the other variables in the model on their relationship with payment methods. However, it situates that the drive to be successful can cause undue pressure on the student while enrolled, resulting in the student taking out loans for their education. Therefore, PIHE actors must be aware of the messages students receive and their influence on their decisions to continue their education. An essential tool institutional leaders can implement is improving academic capital for students, which will foster greater knowledge and attitudes to help connect

students to different funding levels. Further, we encourage crafting messages relevant to the student and their community [80,81] to help support the student and not add additional pressures that success must come at all costs.

Finally, we found differences in students' perceptions of university financial structures and knowledge of and attitudes toward mandatory fees by system. We speculate that students attending different sectors of institutions have differing experiences that shape their experiences. Also, state system institutions may provide financial education programs that provide transparent information related to costs associated with attendance. However, because academic capital is a latent construct, a structural equation model is needed to understand student participants' experiences based on their state system.

Do racial differences in female undergraduate students' university knowledge of financial structures, knowledge and attitudes of mandatory fees, academic capital, and feelings predict their payment methods?

We identified several findings concerning how different racial groups pay for their education. Women who identify as white are more likely to receive a scholarship than any other group when compared to Asian women. Thus, women who identify as white may have more academic capital and connections to knowledgeable individuals on campus. The connection can provide additional knowledge to help solve problems when they need assistance that other historically marginalized communities do not receive. This is supported by the interaction model that found that white female students are more likely to receive a grant than any other group in one range. Although we found that multiracial individuals also have a statistically significant relationship with grants, we speculate that the proximity to whiteness may be beneficial to these individuals because of the racial stratification of our society [82]. Women who identify as white may be believed more (e.g., to be victims of sexual violence) or feel they need more nurturing [83] by faculty and staff at PIHEs than other groups and possibly are the first candidates for financial resources when they become available. Conversely, the findings suggest that Latinx female undergraduate students who have positive attitudes toward PIHE are more likely to receive scholarships in the highest range than any other race/ethnicity in this study. This student group's outlook, in conjunction with support, may drive Latinx students to receive the necessary confidence and capital that provides intrinsic motivation to seek scholarship opportunities.

However, in the loans model, we found several statistically significant relationships at the highest for female students identifying as Other and Black. Specifically, Black women incurred the highest amount of loans, suggesting that this group of students needed the most assistance in paying for their educational costs. The focus of the study was to investigate all women and their payment habits. However, the results align with the corpus of the literature [66,84–86] that found that Black women are more likely to incur student loan debt than any other group. The number of loans may cause undue financial ramifications and dissuade students from continuing their education post-baccalaureate degree because the threat of debt will detour them [87–90]. In addition, the additional debt can add to the wealth gap that continues to widen between Black and white families [89]. The added debt can cause women heads of households and single mothers to become insolvent. In 2018–2019, 68% of associate degrees, 66% of bachelor's degrees, 71% of master's degrees, and 65% of doctorate, medical, and dental degrees were conferred to individuals who identify as Black women [4]. However, Black women earn less than white men, non-white women, and Black men [90]. Williams et al. [91] speculated that Black women chose to gain more education to reduce their allostatic load (e.g., stressors). Education becomes a vehicle to improve their overall health and increase financial outcomes for themselves and future families—even if it may come with a lifetime of debt.

Conversely, the gains in education can be a detriment for many Black women as the additional debt can cause them to add additional jobs to generate revenue or have generational debt (e.g., parents incur debt for students or a spouse) due to never having enough resources to pay off their student loans altogether. As a result, they defer home

ownership, start a family, or develop a business [92–95]. As this population takes steps to improve the outcomes for their family, it is a dual-edged sword—working toward upward mobility while also acquiring more debt at the end of their collegiate journey. Black women often use education to reduce stressors related to being a part of a historically excluded community in a patriarchal society [91]. However, these attainments come at a cost that can cause the same, if not more, stress related to financial concerns [65]. We agree with the policy suggestions from [94], who recommended that federal policy be revised for this specific population. As these are remedies that touch the surface of the issue, they can help address systemic inequities in Black maternal and infant mortality, access to healthcare, and other disparities by ensuring more diverse graduates enter these fields without the fear of having insurmountable debt.

Women hold USD 929 billion of the total USD 1.5 trillion student loan debt, almost two-thirds of the total [96]. Moreover, it takes women an average of 2 years longer than men to pay off their student loan debt, even when making higher payments [12]. The amount of loans and monthly payments adversely impact disposable income, which allows individuals to take vacations and purchase vehicles. Loans negatively impact credit scores because an individual's debt-to-income ratio can typically be unfavorable. Furthermore, it may hinder their ability to invest in the stock market because additional revenue and income are allocated to repay student loan debt. As a result, these individuals have less disposable income, which leads to less diversity in investors, which only allows low debt and wealthy individuals who have the capital to invest. Also, people who have student loans tend to be more reliant on debt when they encounter a financial emergency because of the lack of cash reserves as a result of the responsibility of paying monthly payments [96].

Similarly, the student loan debt concerns mimic the financial housing crisis. Since homeowners could not make their housing payments, they went into foreclosure, which resulted in unfavorable conditions in local markets and eventually caused an economic recession. Comparable to the housing market, lax lending standards (for student loans), reduced state support, increasing costs, and the willingness to pay from students because of the difference in earnings from a high school to a college graduate have increased prices in higher education [2,97]. These have raised concerns about another economic downturn related to the debt associated with student loans [97].

There is a need to bring this to the forefront as the disproportionate number of individuals with student loan debt are women, with a higher percentage of debt being held by Black women than any other race/ethnicity.

In an effort to connect research to practice, we encourage institutional administrators to share the public service loan forgiveness (PSLF) program with current graduate students. The PSLF enables workers in the public sector (e.g., nonprofit, local, and federal government) to forgive their loans after 120 payments. New federal regulation has resulted in individuals who qualify for income-contingent and driven repayment plans to participate in the program. Administrators can support efforts by informing students who have graduated or are majoring in programs in the public sector to enroll in the PLSF program and have loan payments count toward their loans being forgiven. This can also include university employees and become a method to recruit staff to their respective institutions. However, since its inception, there has been a 99% rejection rate [98], and there has been political upheaval as Republicans have sought to repeal the PSLF program [98]. The repeal of this program has ramifications for all students, but especially Black students, as they are more likely to work in the public sector [99,100] and have higher rates of debt than any other student group [83].

Because universities and colleges have some autonomy in tuition and fee costs, the ability to have transparent net cost calculators associated with attendance should be provided. The financial information related to costs of attendance must be detailed by the actual cost of attendance (not estimated prices). This will allow students to understand their actual cost of attendance, including living expenses, tuition, and fee costs. We find that several tools provide this information (e.g., National Center for Education Statistics

College Navigator); however, these tools can be outdated and do not provide costs associated with number of credits enrolled in or major, which can change expenses related to enrollment [18]. Institutional administrators can create a tool that conveys attendance prices in a relevant method that should be culturally congruent to all students. The tool's design should incorporate feedback sessions that include students in the design and incorporate aspects pertinent to the student group at the institution. Moreover, institutions should connect students from historically marginalized communities and first-generation to faculty and peer student support to help dispel myths surrounding higher education and provide culturally specific messaging on the implications of excess debt [15].

7. Limitations

7.1. Methodological

Our research investigation has several limitations. First, the investigation occurred in institutions encompassing four different large higher education systems; however, the generalizability of the sample only represents some women enrolled in higher education. Second, the study included gift cards for participation. Gift cards can incentivize financially constrained students to participate because of the inability to purchase items within the coffee shop routinely. Third, the study used survey research; therefore, measurement error is a concern. Measurement error pertains to how well the questions accurately represent the responses from the participants [101]. We remedied this issue as much as possible by employing a factor analysis. Finally, this investigation included only enrolled undergraduate students who were full-time in person (i.e., online-only students and those attaining graduate education were not eligible). Because of this, the findings should be cautiously interpreted as they do not provide generalized results for all women-identified students.

7.2. Study

This research investigation is an attempt to expand the literature and add to the theory and policy related to how higher education institutions' policy (fee creations), students' past experiences, and connections to people (i.e., academic capital) can shape student behavior regarding fee payment methods at PIHEs. Conversely, this does not address female students attending private or small public higher education institutions who are more dependent on tuition and fees. The differences can relate to how organizational decisions (e.g., fee creation) are implemented or provided to their students, which can result in different behaviors regarding payment methods. Furthermore, this study does not address how students gain knowledge or acquire information about mandatory fees or university financial structures. Also unanswered is how students' internal and external motivators shape their willingness to pay for postsecondary education. A significant finding in the paper is how the desire to become better than the previous generation of family members can motivate students from historically excluded communities to seek risky outcomes in the form of loan debt. Financial literacy can help students understand their cost of attendance [78]. The drive to be successful can mitigate financial literacy knowledge.

Future research should further explore differences in higher education financing across groups, their aversion to loan debt, and the number of hours students work off-campus to pay for their education. Furthermore, intrinsic and extrinsic motivation may cause students to choose their payment methods. Additionally, a separate investigation is needed to help subsidize the accrual debt of women who identify as Black.

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Appendix A. Confirmatory Factor Analysis (CFA)

Table A1. Confirmatory Factor Analysis (CFA).

| <i>Goodness-of-Fit Indices for CFA Model (N = 652)</i> | | | | | | |
|--|------------|-----|------|------|-------------------------|-------|
| Model | χ^2 * | Df | CFI | TLI | RMSEA (90% CI) | SRMR |
| Final CFA Model | 146,629 | 749 | 0.90 | 0.89 | 0.039 (0.036, 0.042) | 0.056 |

Note: CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; 90% Confidence Interval For RMSEA. * Chi-Square statistic was calculate using the Santorra–Bentler correction since Maximum Likelihood Ratio was used in the analysis.

Appendix B. Confirmatory Factor Analysis Variance and Standard Errors (SKAFE)

Table A2. Confirmatory Factor Analysis Variance and Standard Errors (SKAFE).

| <i>CFA Variance and Standard Errors (SKAFE)</i> | | |
|---|----------------------------------|-----------------|
| Factor | R ² Observed Variance | Standard Errors |
| Attitudes toward fees 1 | 0.29 | 0.05 |
| Attitudes toward fees 2 | 0.43 | 0.05 |
| Attitudes toward fees 3 | 0.62 | 0.04 |
| Attitudes toward fees 4 | 0.43 | 0.05 |
| Attitudes toward fees 5 | 0.28 | 0.04 |
| Knowledge of fees 1 | 0.38 | 0.04 |
| Knowledge of fees 2 | 0.52 | 0.04 |
| Knowledge of fees 3 | 0.54 | 0.04 |
| Knowledge of fees 4 | 0.42 | 0.05 |
| Knowledge of fees 5 | 0.38 | 0.04 |
| Knowledge of fees 6 | 0.28 | 0.04 |
| Knowledge of fees 7 | 0.32 | 0.05 |
| Navigation of systems 1 | 0.44 | 0.04 |
| Navigation of systems 2 | 0.51 | 0.04 |
| Navigation of systems 3 | 0.43 | 0.05 |
| Navigation of systems 4 | 0.41 | 0.05 |
| Navigation of systems 5 | 0.44 | 0.04 |
| Navigation of systems 6 | 0.57 | 0.04 |
| Family uplift 1 | 0.35 | 0.05 |
| Family uplift 2 | 0.44 | 0.06 |
| Family uplift 3 | 0.51 | 0.05 |
| Family uplift 4 | 0.44 | 0.06 |
| Supportive networks 1 | 0.43 | 0.06 |
| Supportive networks 2 | 0.59 | 0.05 |
| Supportive networks 3 | 0.57 | 0.05 |
| Concerns about costs 1 | 0.47 | 0.05 |
| Concerns about costs 2 | 0.60 | 0.04 |
| Concerns about costs 3 | 0.64 | 0.04 |
| Concerns about costs 4 | 0.68 | 0.04 |
| Trustworthy information 1 | 0.29 | 0.06 |

Table A2. Cont.

| CFA Variance and Standard Errors (SKAFE) | | |
|--|----------------------------------|-----------------|
| Factor | R ² Observed Variance | Standard Errors |
| Trustworthy information 2 | 0.41 | 0.06 |
| Trustworthy information 3 | 0.51 | 0.07 |
| Overcoming barriers 1 | 0.53 | 0.05 |
| Overcoming barriers 2 | 0.60 | 0.06 |
| Overcoming barriers 3 | 0.52 | 0.06 |
| Familial expectations 2 | 0.63 | 0.04 |
| Familial expectations 3 | 0.69 | 0.04 |
| College knowledge 1 | 0.73 | 0.11 |
| College knowledge 2 | 0.33 | 0.05 |
| College knowledge 3 | 0.45 | 0.06 |
| College knowledge 4 | 0.41 | 0.06 |

Appendix C. SKAFE Internal Reliability

Table A3. SKAFE Internal Reliability

| Factor Name | # of Items | Mean | Variance | Cronbach's α |
|-------------------------|------------|------|----------|---------------------|
| Attitudes toward fees | 5 | 2.90 | 0.02 | 0.78 |
| Knowledge of fees | 7 | 2.67 | 0.04 | 0.81 |
| Navigation of systems | 6 | 2.66 | 0.01 | 0.83 |
| Family uplift | 4 | 3.03 | 0.00 | 0.77 |
| Supportive networks | 3 | 3.12 | 0.02 | 0.76 |
| Concerns about costs | 4 | 2.48 | 0.04 | 0.87 |
| Trustworthy information | 3 | 2.79 | 0.01 | 0.70 |
| Overcoming barriers | 3 | 2.98 | 0.01 | 0.77 |
| Familial expectations | 3 | 2.94 | 0.02 | 0.87 |
| College knowledge | 4 | 2.91 | 0.00 | 0.79 |
| Total | 42 | 2.81 | 0.03 | 0.88 |

Appendix D. Student's University Knowledge (Comparison)

Table A4. Student's University Knowledge (Comparison).

| a | | | | | | | |
|----------------------|----------|-----------|------------------------|-------|---------------------------------|--------|-----|
| School Type | Mean | Std. Err | Unadjusted [95% Conf.] | | | | |
| AZ (A) | 25.96 | 0.16 | 25.65 | 26.28 | | | |
| AZ (B) | 10.17 | 0.62 | 8.95 | 11.38 | | | |
| CA | 10.08 | 0.37 | 9.35 | 10.81 | | | |
| CA(B) | 13.46 | 0.20 | 13.06 | 13.87 | | | |
| GA | 10.66 | 0.23 | 10.21 | 11.12 | | | |
| b | | | | | | | |
| University Knowledge | Contrast | Std. Err. | Bonferroni t | | Bonferroni [95% Conf. Interval] | | |
| AZ (B) vs. AZ (A) | -15.80 | 0.64 | -24.70 | 0.000 | -17.60 | -14.00 | *** |
| CA (A) vs. AZ (A) | -15.88 | 0.40 | -39.28 | 0.000 | -17.02 | -14.74 | *** |
| CA (B) vs. AZ (A) | -12.50 | 0.26 | -48.20 | 0.000 | -13.23 | -11.77 | *** |
| GA vs. AZ (A) | -15.30 | 0.28 | -55.04 | 0.000 | -16.09 | -14.52 | *** |
| CA (B) vs. AZ (B) | -0.09 | 0.72 | -0.12 | 1.000 | -2.12 | 1.94 | |
| CA (B) vs. AZ (B) | 3.30 | 0.65 | 5.06 | 0.000 | 1.46 | 5.14 | *** |
| GA vs. AZ (B) | 0.49 | 0.66 | 0.75 | 1.000 | -1.36 | 2.35 | |
| CA (B) vs. CA (A) | 3.39 | 0.42 | 7.98 | 0.000 | 2.19 | 4.60 | |
| GA vs. CA (A) | 0.58 | 0.44 | 1.33 | 1.000 | -0.64 | 1.81 | *** |
| GA vs. CA (B) | -2.81 | 0.31 | -9.16 | 0.000 | -3.77 | -1.94 | *** |

*** $p < 0.001$.

Appendix E. Student’s Attitudes toward Mandatory Fees (Comparison)

Table A5. Student’s Attitudes toward Mandatory Fees (Comparison).

| School Type | Mean | Std. Err | Unadjusted | | | |
|-------------|-------|----------|-------------|-------|--|--|
| | | | [95% Conf.] | | | |
| AZ (A) | 14.46 | 0.17 | 14.13 | 14.79 | | |
| AZ (B) | 16.54 | 0.61 | 15.33 | 17.74 | | |
| CA | 17.62 | 0.36 | 16.91 | 18.34 | | |
| CA(B) | 18.37 | 0.21 | 17.95 | 18.78 | | |
| GA | 16.99 | 0.24 | 16.52 | 17.45 | | |

| Attitudes | Contrast | Std. Err. | Bonferroni | | Bonferroni | | |
|-------------------|----------|-----------|------------|--------|----------------------|-------|-----|
| | | | t | p > t | [95% Conf. Interval] | | |
| AZ (B) vs. AZ (A) | 2.08 | 0.63 | 3.27 | 0.011 | .29 | 3.86 | * |
| CA (A) vs. AZ (A) | 3.16 | 0.40 | 7.93 | 0.000 | 2.04 | 4.29 | *** |
| CA (B) vs. AZ (A) | 3.91 | 0.27 | 14.54 | 0.000 | 3.15 | 4.66 | *** |
| GA vs. AZ (A) | 2.52 | 0.29 | 8.77 | 0.000 | 1.71 | 3.34 | *** |
| CA (B) vs. AZ (B) | 1.09 | 0.71 | 1.53 | 1.000 | −0.92 | 3.09 | |
| CA (B) vs. AZ (B) | 1.83 | 0.65 | 2.83 | 0.049 | 0.01 | 3.66 | * |
| GA vs. AZ (B) | 0.45 | 0.66 | 0.69 | 1.000 | −1.40 | 2.30 | |
| CA (B) vs. CA (A) | 0.74 | 0.42 | 1.77 | 0.774 | −0.44 | 1.92 | |
| GA vs. CA (A) | −0.64 | 0.43 | −1.47 | 1.000 | −1.85 | 0.58 | |
| GA vs. CA (B) | −1.38 | 0.32 | −4.36 | 0.000 | −2.27 | −0.49 | *** |

* $p < 0.05$. *** $p < 0.001$.

Appendix F. Student’s Knowledge of Mandatory Fees (Comparison)

Table A6. Student’s Knowledge of Mandatory Fees (Comparison).

| School Type | Mean | Std. Err | Unadjusted | | | |
|-------------|-------|----------|-------------|-------|--|--|
| | | | [95% Conf.] | | | |
| AZ (A) | −0.07 | 0.08 | −0.24 | 0.09 | | |
| AZ (B) | −0.74 | 0.31 | −1.35 | −0.13 | | |
| CA | −0.22 | 0.18 | −0.58 | 0.14 | | |
| CA(B) | 0.03 | 0.11 | −0.18 | 0.24 | | |
| GA | 0.39 | 0.12 | 0.15 | 0.62 | | |

| Attitudes | Contrast | Std. Err. | Bonferroni | | Bonferroni | | |
|-------------------|----------|-----------|------------|--------|----------------------|------|----|
| | | | t | p > t | [95% Conf. Interval] | | |
| AZ (B) vs. AZ (A) | −0.67 | 0.32 | −2.06 | 0.395 | −1.57 | 0.24 | |
| CA (A) vs. AZ (A) | −0.15 | 0.20 | −0.75 | 1.000 | −0.72 | 0.42 | |
| CA (B) vs. AZ (A) | 0.10 | 0.14 | 0.73 | 1.000 | −0.29 | 0.48 | |
| GA vs. AZ (A) | 0.46 | 0.15 | 3.13 | 0.018 | 0.05 | 0.87 | * |
| CA (B) vs. AZ (B) | 0.51 | 0.36 | 1.42 | 1.000 | −0.51 | 1.53 | |
| CA (B) vs. AZ (B) | 0.77 | 0.33 | 2.32 | 0.205 | −0.16 | 1.69 | |
| GA vs. AZ (B) | 1.12 | 0.33 | 3.37 | 0.008 | 0.19 | 2.06 | ** |
| CA (B) vs. CA (A) | 0.25 | 0.21 | 1.18 | 1.000 | −0.35 | 0.85 | |
| GA vs. CA (A) | 0.61 | 0.22 | 1.78 | 0.056 | −0.01 | 1.23 | |
| GA vs. CA (B) | 0.36 | 0.16 | 2.23 | 0.258 | −0.09 | 0.81 | |

* $p < 0.05$. ** $p < 0.01$.

Appendix G. Grants
Multinomial logistic regression

Table A7. Grants.

| Range | Grants | RRR | St. Err. | t Value | p Value | [95% Conf. Interval] | Sig | | |
|-----------------|--------------------------------------|---------|----------|---------|---------|----------------------|---------|--------|---|
| 500–700 | Asian | 1.000 | . | . | . | . | . | | |
| | Blk/Afro-Am. | 0.630 | 0.593 | −0.49 | 0.623 | 0.099 | 3.989 | | |
| | His/Latin | 2.756 | 2.352 | 1.19 | 0.235 | 0.517 | 14.685 | | |
| | Indigenous | 0.483 | 0.640 | −0.55 | 0.583 | 0.036 | 6.477 | | |
| | PacificIsl | 0.015 | 106.085 | −0.00 | 1.000 | 0.000 | . | | |
| | White | 2.561 | 1.903 | 1.27 | 0.206 | 0.597 | 10.991 | | |
| | Multi | 0.000 | 0.004 | −0.03 | 0.976 | 0.000 | . | | |
| | Other | 0.000 | 0.004 | −0.00 | 0.997 | 0.000 | . | | |
| | pell | 177.336 | 121.422 | 7.56 | 0.000 | 46.342 | 678.599 | *** | |
| | major | 1.037 | 0.118 | 0.32 | 0.747 | 0.830 | 1.297 | | |
| | frst_gen | 1.593 | 0.700 | 1.06 | 0.289 | 0.673 | 3.769 | | |
| | Navofsys | 0.928 | 0.277 | −0.25 | 0.803 | 0.517 | 1.667 | | |
| | Famup | 0.726 | 0.198 | −1.17 | 0.240 | 0.425 | 1.239 | | |
| | Supnet | 1.206 | 0.335 | 0.67 | 0.501 | 0.699 | 2.080 | | |
| | Concost | 1.041 | 0.268 | 0.15 | 0.877 | 0.628 | 1.725 | | |
| | Trustinfo | 1.148 | 0.306 | 0.52 | 0.604 | 0.682 | 1.934 | | |
| | Overbar | 1.679 | 0.424 | 2.05 | 0.040 | 1.023 | 2.755 | * | |
| | Famexp | 1.216 | 0.275 | 0.87 | 0.387 | 0.781 | 1.894 | | |
| | Collknw | 0.644 | 0.174 | −1.63 | 0.103 | 0.379 | 1.094 | | |
| | total_knowledge | 1.060 | 0.184 | 0.34 | 0.735 | 0.755 | 1.489 | | |
| attitude1 | 1.047 | 0.096 | 0.50 | 0.614 | 0.875 | 1.255 | | | |
| unv_knw | 0.987 | 0.042 | −0.31 | 0.758 | 0.907 | 1.074 | | | |
| Constant | 0.011 | 0.026 | −1.98 | 0.048 | 0.000 | 0.955 | * | | |
| 701–900 | Asian | 1.000 | . | . | . | . | . | | |
| | Blk/Afro-Am. | 0.513 | 0.550 | −0.62 | 0.533 | 0.063 | 4.189 | | |
| | His/Latin | 1.687 | 1.729 | 0.51 | 0.610 | 0.226 | 12.575 | | |
| | Indigenous | 0.466 | 0.653 | −0.55 | 0.586 | 0.030 | 7.263 | | |
| | PacificIsl | 0.014 | 96.763 | −0.00 | 1.000 | 0.000 | . | | |
| | White | 3.975 | 3.428 | 1.60 | 0.109 | 0.733 | 21.544 | | |
| | Multi | 2.405 | 3.323 | 0.64 | 0.525 | 0.160 | 36.077 | | |
| | Other | 33.345 | 58.170 | 2.01 | 0.044 | 1.092 | 1018.46 | * | |
| | Interaction term ethnicity#knowledge | White | 3.894 | 2.324 | 2.28 | 0.023 | 1.208 | 12.545 | * |
| | pell | 275.092 | 196.675 | 7.86 | 0.000 | 67.751 | 1116.96 | *** | |
| | major | 0.927 | 0.107 | −0.66 | 0.512 | 0.739 | 1.162 | | |
| | frst_gen | 2.530 | 1.135 | 2.07 | 0.039 | 1.050 | 6.097 | * | |
| | Navofsys | 1.047 | 0.320 | 0.15 | 0.882 | 0.574 | 1.906 | | |
| | Famup | 0.971 | 0.278 | −0.10 | 0.918 | 0.554 | 1.703 | | |
| | Supnet | 1.121 | 0.335 | 0.38 | 0.701 | 0.624 | 2.014 | | |
| | Concost | 0.695 | 0.178 | −1.42 | 0.155 | 0.421 | 1.148 | | |
| | Trustinfo | 1.302 | 0.373 | 0.92 | 0.357 | 0.743 | 2.282 | | |
| | Overbar | 1.306 | 0.340 | 1.02 | 0.306 | 0.783 | 2.177 | | |
| | Famexp | 1.110 | 0.255 | 0.45 | 0.650 | 0.707 | 1.742 | | |
| | Collknw | 0.558 | 0.152 | −2.15 | 0.032 | 0.328 | 0.950 | * | |
| total_knowledge | 1.170 | 0.208 | 0.88 | 0.377 | 0.826 | 1.659 | | | |
| attitude1 | 0.979 | 0.092 | −0.23 | 0.822 | 0.815 | 1.177 | | | |
| unv_knw | 0.948 | 0.042 | −1.22 | 0.224 | 0.870 | 1.033 | | | |
| Constant | 0.050 | 0.117 | −1.28 | 0.199 | 0.001 | 4.795 | | | |
| | Asian | 1.000 | . | . | . | . | . | | |
| | Blk/Afro-Am. | 0.919 | 0.973 | −0.08 | 0.936 | 0.115 | 7.321 | | |
| | His/Latin | 2.903 | 2.942 | 1.05 | 0.293 | 0.398 | 21.155 | | |

Table A7. Cont.

| Range | Grants | RRR | St. Err. | t Value | p Value | [95% Conf. Interval] | | Sig | |
|-----------------|--------------------------------------|-------------|----------|---------|---------|----------------------|---------|--------|---|
| 901–1000 | Indigenous | 0.148 | 0.244 | −1.16 | 0.246 | 0.006 | 3.738 | | |
| | PacificIsl | 67900 | 1890 | 0.01 | 0.996 | 0.000 | . | | |
| | White | 5.831 | 5.199 | 1.98 | 0.048 | 1.016 | 33.469 | * | |
| | Multi | 4.334 | 5.370 | 1.18 | 0.237 | 0.382 | 49.154 | | |
| | Other | 0.000 | 0.010 | −0.00 | 0.998 | 0.000 | . | | |
| | pell | 568.303 | 413.428 | 8.72 | 0.000 | 136.568 | 2364.89 | *** | |
| | major | 0.865 | 0.096 | −1.31 | 0.190 | 0.696 | 1.075 | | |
| | frst_gen | 3.198 | 1.400 | 2.65 | 0.008 | 1.356 | 7.543 | *** | |
| | Navofsys | 1.053 | 0.309 | 0.17 | 0.861 | 0.592 | 1.871 | | |
| | Famup | 0.676 | 0.183 | −1.44 | 0.149 | 0.397 | 1.150 | | |
| | Supnet | 0.941 | 0.273 | −0.21 | 0.835 | 0.533 | 1.663 | | |
| | Concost | 0.877 | 0.219 | −0.52 | 0.600 | 0.538 | 1.431 | | |
| | Trustinfo | 1.479 | 0.401 | 1.44 | 0.149 | 0.869 | 2.516 | | |
| | Overbar | 1.248 | 0.312 | 0.89 | 0.376 | 0.764 | 2.036 | | |
| | Famexp | 0.841 | 0.185 | −0.79 | 0.433 | 0.546 | 1.296 | | |
| | Collknw | 0.663 | 0.173 | −1.57 | 0.115 | 0.397 | 1.106 | | |
| | total_knowledge | 1.197 | 0.206 | 1.05 | 0.296 | 0.854 | 1.677 | | |
| attitude1 | 0.925 | 0.083 | −0.86 | 0.389 | 0.775 | 1.104 | | | |
| unv_knw | 0.918 | 0.039 | −2.04 | 0.041 | 0.845 | 0.997 | ** | | |
| Constant | 0.132 | 0.293 | −0.91 | 0.362 | 0.002 | 10.297 | | | |
| 1001–2000 | Asian | 1.000 | . | . | . | . | . | | |
| | Blk/Afro-Am. | 0.603 | 0.459 | −0.66 | 0.507 | 0.136 | 2.682 | | |
| | His/Latin | 1.273 | 0.877 | 0.35 | 0.726 | 0.330 | 4.913 | | |
| | Indigenous | 0.207 | 0.247 | −1.32 | 0.187 | 0.020 | 2.146 | | |
| | PacificIsl | 4210 | 1170 | 0.01 | 0.996 | 0.000 | . | | |
| | White | 1.248 | 0.705 | 0.39 | 0.694 | 0.413 | 3.777 | | |
| | Multi | 4.280 | 3.285 | 1.89 | 0.058 | 0.951 | 19.268 | | |
| | Other | 0.000 | 0.003 | −0.00 | 0.997 | 0.000 | . | | |
| | Interaction term ethnicity#knowledge | Multiracial | 4.437 | 2.940 | 2.25 | 0.025 | 1.221 | 16.259 | * |
| | pell | 291.535 | 187.495 | 8.82 | 0.000 | 82.652 | 1028.31 | *** | |
| | major | 1.148 | 0.120 | 1.32 | 0.187 | 0.935 | 1.409 | | |
| | frst_gen | 2.694 | 1.011 | 2.64 | 0.008 | 1.291 | 5.620 | ** | |
| | Navofsys | 0.894 | 0.245 | −0.41 | 0.683 | 0.522 | 1.530 | | |
| | Famup | 0.907 | 0.217 | −0.41 | 0.683 | 0.568 | 1.449 | | |
| | Supnet | 1.262 | 0.303 | 0.97 | 0.333 | 0.788 | 2.021 | | |
| | Concost | 0.840 | 0.180 | −0.81 | 0.416 | 0.553 | 1.277 | | |
| | Trustinfo | 1.027 | 0.233 | 0.12 | 0.906 | 0.659 | 1.601 | | |
| Overbar | 1.335 | 0.291 | 1.32 | 0.186 | 0.870 | 2.048 | | | |
| Famexp | 0.892 | 0.176 | −0.58 | 0.563 | 0.606 | 1.314 | | | |
| Collknw | 0.837 | 0.204 | −0.73 | 0.467 | 0.519 | 1.351 | | | |
| total_knowledge | 1.178 | 0.174 | 1.11 | 0.267 | 0.882 | 1.572 | | | |
| attitude1 | 0.961 | 0.083 | −0.46 | 0.649 | 0.811 | 1.140 | | | |
| unv_knw | 1.075 | 0.041 | 1.90 | 0.057 | 0.998 | 1.159 | | | |
| Constant | 0.012 | 0.024 | −2.16 | 0.031 | 0.000 | 0.667 | * | | |
| Above 2000 | Asian | 1.000 | . | . | . | . | . | | |
| | Blk/Afro-Am. | 0.712 | 0.541 | −0.45 | 0.655 | 0.161 | 3.153 | | |
| | His/Latin | 1.153 | 0.790 | 0.21 | 0.835 | 0.301 | 4.416 | | |
| | Indigenous | 0.033 | 0.049 | −2.26 | 0.024 | 0.002 | 0.637 | * | |
| | PacificIsl | 0.038 | 176.480 | −0.00 | 0.999 | 0.000 | . | | |
| | White | 1.407 | 0.797 | 0.60 | 0.547 | 0.463 | 4.268 | | |
| | Multi | 3.222 | 2.556 | 1.48 | 0.140 | 0.681 | 15.254 | | |
| | Other | 0.000 | 0.004 | −0.00 | 0.997 | 0.000 | . | | |
| | pell | 462.704 | 299.750 | 9.47 | 0.000 | 129.980 | 1647.14 | *** | |
| | major | 1.222 | 0.128 | 1.91 | 0.056 | 0.995 | 1.501 | | |
| frst_gen | 4.183 | 1.584 | 3.78 | 0.000 | 1.991 | 8.788 | *** | | |
| Navofsys | 1.234 | 0.338 | 0.77 | 0.443 | 0.721 | 2.111 | | | |

Table A7. Cont.

| Range | Grants | RRR | St. Err. | t Value | p Value | [95% Conf. Interval] | Sig |
|-------------------------|--------------------|-------|----------|----------------------|---------|----------------------|----------|
| | Famup | 0.820 | 0.195 | −0.83 | 0.404 | 0.515 1.307 | |
| | Supnet | 0.780 | 0.189 | −1.03 | 0.304 | 0.486 1.253 | |
| | Concost | 1.033 | 0.225 | 0.15 | 0.883 | 0.674 1.583 | |
| | Trustinfo | 1.129 | 0.257 | 0.53 | 0.593 | 0.723 1.764 | |
| | Overbar | 0.918 | 0.200 | −0.39 | 0.695 | 0.599 1.407 | |
| | Famexp | 0.898 | 0.177 | −0.55 | 0.585 | 0.610 1.322 | |
| | Collknw | 1.084 | 0.268 | 0.33 | 0.744 | 0.668 1.759 | |
| | total_knowledge | 1.353 | 0.200 | 2.04 | 0.041 | 1.012 1.809 | * |
| | attitude1 | 0.890 | 0.077 | −1.35 | 0.176 | 0.752 1.054 | |
| | unv_knw | 1.083 | 0.041 | 2.13 | 0.033 | 1.007 1.166 | * |
| | Constant | 0.019 | 0.038 | −1.98 | 0.048 | 0.000 0.969 | * |
| I do not receive grants | Asian | 1.000 | . | . | . | . | . |
| | Blk/Afro-Am. | 1.000 | . | . | . | . | . |
| | His/Latin | 1.000 | . | . | . | . | . |
| | Indigenous | 1.000 | . | . | . | . | . |
| | PacificIsl | 1.000 | . | . | . | . | . |
| | White | 1.000 | . | . | . | . | . |
| | Multi | 1.000 | . | . | . | . | . |
| | Other | 1.000 | . | . | . | . | . |
| | pell | 1.000 | . | . | . | . | . |
| | major | 1.000 | . | . | . | . | . |
| | frst_gen | 1.000 | . | . | . | . | . |
| | Navofsys | 1.000 | . | . | . | . | . |
| | Famup | 1.000 | . | . | . | . | . |
| | Supnet | 1.000 | . | . | . | . | . |
| | Concost | 1.000 | . | . | . | . | . |
| | Trustinfo | 1.000 | . | . | . | . | . |
| | Overbar | 1.000 | . | . | . | . | . |
| | Famexp | 1.000 | . | . | . | . | . |
| | Collknw | 1.000 | . | . | . | . | . |
| | total_knowledge | 1.000 | . | . | . | . | . |
| attitude1 | 1.000 | . | . | . | . | . | |
| unv_knw | 1.000 | . | . | . | . | . | |
| Constant | 1.000 | . | . | . | . | . | |
| | Mean dependent var | | 4.498 | SD dependent var | | | 1.631 |
| | Pseudo r-squared | | 0.335 | Number of obs | | | 638 |
| | Chi-square | | 683.026 | Prob > chi2 | | | 0.000 |
| | Akaike crit.(AIC) | | 1575.860 | Bayesian crit. (BIC) | | | 2066.277 |
| | Cox-Snell/ML | | 0.65 | | | | |

* p < 0.05. ** p < 0.01. *** p < 0.001.

Appendix H. Scholarships
Multinomial logistic regression

Table A8. Scholarships.

| Range | Scholarships | RRR | St. Err. | t-Value | p-Value | [95% Conf. Interval] | Sig |
|----------|--------------|-------|----------|---------|---------|----------------------|-----|
| 500–1500 | Asian | 1.000 | . | . | . | . | . |
| | Blk/Afro-Am. | 0.448 | 0.264 | −1.36 | 0.173 | 0.141 1.423 | |
| | His/Latin | 1.161 | 0.676 | 0.26 | 0.797 | 0.371 3.632 | |
| | Indigenous | 1.528 | 1.361 | 0.47 | 0.635 | 0.266 8.763 | |
| | Pacific Isl | 0.369 | 1006.283 | 0.00 | 1.000 | 0.000 . | |
| | White | 1.386 | 0.667 | 0.68 | 0.498 | 0.540 3.560 | |
| | Multi | 1.627 | 1.323 | 0.60 | 0.549 | 0.331 8.004 | |
| | Other | 0.000 | 0.002 | −0.01 | 0.992 | 0.000 . | |

Table A8. Cont.

| Range | Scholarships | RRR | St. Err. | t-Value | p-Value | [95% Conf. Interval] | | Sig |
|-----------|-----------------|-------|----------|---------|---------|----------------------|--------|-----|
| | pell | 3.225 | 1.154 | 3.27 | 0.001 | 1.599 | 6.503 | *** |
| | major | 0.723 | 0.059 | −3.94 | 0.000 | 0.616 | 0.850 | *** |
| | frst_gen | 0.361 | 0.127 | −2.90 | 0.004 | 0.182 | 0.719 | ** |
| | Nav of sys | 1.623 | 0.371 | 2.12 | 0.034 | 1.037 | 2.540 | * |
| | Fam up | 1.092 | 0.233 | 0.41 | 0.679 | 0.719 | 1.660 | |
| | Sup net | 1.297 | 0.285 | 1.18 | 0.236 | 0.843 | 1.995 | |
| | Con cost | 1.241 | 0.244 | 1.10 | 0.273 | 0.844 | 1.825 | |
| | Trust info | 0.939 | 0.186 | −0.32 | 0.750 | 0.636 | 1.386 | |
| | Over bar | 1.451 | 0.273 | 1.98 | 0.048 | 1.003 | 2.099 | * |
| | Fam exp | 1.353 | 0.239 | 1.71 | 0.088 | 0.956 | 1.913 | |
| | Coll knw | 0.665 | 0.137 | −1.97 | 0.048 | 0.444 | 0.997 | * |
| | total_knowledge | 1.026 | 0.140 | 0.18 | 0.853 | 0.785 | 1.340 | |
| | attitude1 | 1.007 | 0.064 | 0.11 | 0.915 | 0.889 | 1.140 | |
| | unv_knw | 0.938 | 0.029 | −2.09 | 0.037 | 0.883 | 0.996 | * |
| | Constant | 3.042 | 4.612 | 0.73 | 0.463 | 0.156 | 59.378 | |
| | Asian | 1.000 | . | . | . | . | . | |
| | Blk/Afro-Am. | 1.706 | 0.954 | 0.95 | 0.339 | 0.570 | 5.106 | |
| | His/Latin | 2.029 | 1.146 | 1.25 | 0.211 | 0.670 | 6.140 | |
| | Indigenous | 3.105 | 2.646 | 1.33 | 0.184 | 0.585 | 16.499 | |
| | Pacific Isl | 2180 | 3320 | 0.01 | 0.992 | 0.000 | . | |
| | White | 4.553 | 2.275 | 3.03 | 0.002 | 1.710 | 12.125 | ** |
| | Multi | 3.644 | 2.546 | 1.85 | 0.064 | 0.927 | 14.329 | |
| 1501–3500 | Other | 0.000 | 0.004 | −0.01 | 0.991 | 0.000 | . | |
| | pell | 1.948 | 0.552 | 2.35 | 0.019 | 1.118 | 3.395 | * |
| | major | 0.806 | 0.054 | −3.19 | 0.001 | 0.706 | 0.920 | *** |
| | frst_gen | 1.026 | 0.285 | 0.09 | 0.925 | 0.596 | 1.768 | |
| | Nav of sys | 1.356 | 0.236 | 1.75 | 0.079 | 0.965 | 1.906 | |
| | Fam up | 0.881 | 0.145 | −0.77 | 0.439 | 0.638 | 1.215 | |
| | Sup net | 1.298 | 0.230 | 1.47 | 0.141 | 0.917 | 1.836 | |
| | Con cost | 1.095 | 0.161 | 0.62 | 0.535 | 0.822 | 1.460 | |
| | Trust info | 0.982 | 0.154 | −0.12 | 0.908 | 0.722 | 1.335 | |
| | Over bar | 1.184 | 0.174 | 1.15 | 0.251 | 0.887 | 1.581 | |
| | Fam exp | 1.136 | 0.154 | 0.94 | 0.349 | 0.870 | 1.483 | |
| | Coll knw | 0.717 | 0.117 | −2.04 | 0.042 | 0.521 | 0.988 | * |
| | total_knowledge | 0.864 | 0.094 | −1.34 | 0.179 | 0.698 | 1.069 | |
| | attitude1 | 0.991 | 0.051 | −0.17 | 0.866 | 0.896 | 1.097 | |
| | unv_knw | 0.988 | 0.024 | −0.49 | 0.622 | 0.941 | 1.037 | |
| | Constant | 0.797 | 1.022 | −0.18 | 0.860 | 0.065 | 9.836 | |
| | Asian | 1.000 | . | . | . | . | . | |
| | Blk/Afro-Am. | 1.106 | 0.565 | 0.20 | 0.843 | 0.407 | 3.010 | |
| | His/Latin | 0.890 | 0.476 | −0.22 | 0.827 | 0.312 | 2.540 | |
| | Indigenous | 1.981 | 1.679 | 0.81 | 0.420 | 0.376 | 10.432 | |
| | Pacific Isl | 5200 | 7940 | 0.01 | 0.992 | 0.000 | . | |
| | White | 1.557 | 0.674 | 1.02 | 0.307 | 0.666 | 3.637 | |
| | Multi | 1.403 | 0.969 | 0.49 | 0.624 | 0.362 | 5.432 | |
| 3501–5500 | Other | 1.500 | 2.052 | 0.30 | 0.767 | 0.103 | 21.911 | |
| | pell | 0.981 | 0.310 | −0.06 | 0.951 | 0.528 | 1.821 | |
| | major | 0.901 | 0.070 | −1.34 | 0.180 | 0.773 | 1.050 | |
| | frst_gen | 0.682 | 0.213 | −1.22 | 0.222 | 0.370 | 1.259 | |
| | Nav of sys | 1.516 | 0.318 | 1.98 | 0.048 | 1.005 | 2.287 | ** |
| | Fam up | 0.764 | 0.141 | −1.46 | 0.145 | 0.532 | 1.097 | |
| | Sup net | 1.188 | 0.227 | 0.90 | 0.367 | 0.817 | 1.728 | |
| | Con cost | 1.114 | 0.184 | 0.65 | 0.513 | 0.806 | 1.539 | |
| | Trust info | 1.177 | 0.216 | 0.89 | 0.373 | 0.822 | 1.687 | |
| | Over bar | 1.181 | 0.198 | 0.99 | 0.322 | 0.850 | 1.642 | |
| | Fam exp | 1.035 | 0.156 | 0.23 | 0.822 | 0.770 | 1.391 | |
| | Coll knw | 1.044 | 0.195 | 0.23 | 0.817 | 0.725 | 1.505 | |
| | total_knowledge | 0.826 | 0.100 | −1.58 | 0.114 | 0.652 | 1.047 | |

Table A8. Cont.

| Range | Scholarships | RRR | St. Err. | t-Value | p-Value | [95% Conf. Interval] | Sig |
|---|-------------------------------------|-------|----------|----------------------|---------|----------------------|----------|
| | attitude1 | 0.970 | 0.060 | -0.49 | 0.621 | 0.859 1.095 | |
| | unv_knw | 1.048 | 0.029 | 1.68 | 0.094 | 0.992 1.107 | |
| | Constant | 0.631 | 0.917 | -0.32 | 0.751 | 0.037 10.889 | |
| Above 5500 Interaction term ethnicity#attitudes | Asian | 1.000 | . | . | . | . | . |
| | Blk/Afro-Am. | 0.775 | 0.389 | -0.51 | 0.612 | 0.289 2.075 | |
| | His/Latin | 1.169 | 0.565 | 0.32 | 0.747 | 0.453 3.017 | |
| | Indigenous | 0.621 | 0.622 | -0.47 | 0.635 | 0.087 4.427 | |
| | Pacific Isl | 1.911 | 4513.379 | 0.00 | 1.000 | 0.000 . | |
| | White | 1.216 | 0.490 | 0.48 | 0.628 | 0.551 2.680 | |
| | Multi | 1.298 | 0.855 | 0.40 | 0.693 | 0.357 4.722 | |
| | Other | 0.000 | 0.002 | -0.01 | 0.991 | 0.000 . | |
| | Hispanic | 1.519 | 0.257 | 2.47 | 0.014 | 1.089 2.116 | * |
| | pell | 0.887 | 0.281 | -0.38 | 0.705 | 0.476 1.652 | |
| | major | 0.850 | 0.065 | -2.13 | 0.033 | 0.732 0.987 | * |
| | frst_gen | 0.641 | 0.200 | -1.42 | 0.155 | 0.348 1.183 | |
| | Nav of sys | 1.781 | 0.412 | 2.49 | 0.013 | 1.131 2.804 | * |
| | Fam up | 0.722 | 0.134 | -1.75 | 0.080 | 0.501 1.040 | |
| | Sup net | 1.563 | 0.298 | 2.34 | 0.019 | 1.075 2.271 | * |
| | Con cost | 1.001 | 0.164 | 0.01 | 0.993 | 0.726 1.382 | |
| | Trust info | 0.982 | 0.177 | -0.10 | 0.921 | 0.691 1.398 | |
| | Over bar | 1.024 | 0.168 | 0.14 | 0.885 | 0.743 1.412 | |
| | Fam exp | 0.690 | 0.108 | -2.38 | 0.017 | 0.508 0.937 | * |
| | Coll knw | 0.871 | 0.160 | -0.75 | 0.452 | 0.608 1.248 | |
| | total_knowledge | 0.811 | 0.095 | -1.78 | 0.075 | 0.645 1.021 | |
| | attitude1 | 0.935 | 0.064 | -0.97 | 0.331 | 0.818 1.070 | |
| | unv_knw | 1.098 | 0.030 | 3.40 | 0.001 | 1.040 1.159 | *** |
| | Constant | 0.788 | 1.196 | -0.16 | 0.875 | 0.040 15.416 | |
| | I do not receive scholarships | Asian | 1.000 | . | . | . | . |
| Blk/Afro-Am. | | 1.000 | . | . | . | . | . |
| His/Latin | | 1.000 | . | . | . | . | . |
| Indigenous | | 1.000 | . | . | . | . | . |
| Pacific Isl | | 1.000 | . | . | . | . | . |
| White | | 1.000 | . | . | . | . | . |
| Multi | | 1.000 | . | . | . | . | . |
| Other | | 1.000 | . | . | . | . | . |
| pell | | 1.000 | . | . | . | . | . |
| major | | 1.000 | . | . | . | . | . |
| frst_gen | | 1.000 | . | . | . | . | . |
| Nav of sys | | 1.000 | . | . | . | . | . |
| Fam up | | 1.000 | . | . | . | . | . |
| Sup net | | 1.000 | . | . | . | . | . |
| Con cost | | 1.000 | . | . | . | . | . |
| Trust info | | 1.000 | . | . | . | . | . |
| Over bar | | 1.000 | . | . | . | . | . |
| Fam exp | | 1.000 | . | . | . | . | . |
| Coll knw | | 1.000 | . | . | . | . | . |
| total_knowledge | | 1.000 | . | . | . | . | . |
| attitude1 | 1.000 | . | . | . | . | . | |
| unv_knw | 1.000 | . | . | . | . | . | |
| Constant | 1.000 | . | . | . | . | . | |
| Mean dependent var | | | 3.254 | SD dependent var | | | 1.410 |
| Pseudo r-squared | | | 0.137 | Number of obs | | | 638.000 |
| Chi-square | | | 273.866 | Prob > chi2 | | | 0.000 |
| Akaike crit. (AIC) | | | 1905.101 | Bayesian crit. (BIC) | | | 2297.435 |
| Cox-Snell/ML | | | 0.35 | | | | |

* p < 0.05. ** p < 0.01. *** p < 0.001.

Appendix I. Loans
Multinomial logistic regression

Table A9. Loans.

| Range | Loans | RRR | St. Err. | t Value | p Value | [95% Conf. Interval] | | Sig |
|-----------|-----------------|--------|----------|---------|---------|----------------------|---------|-----|
| 500–1500 | Asian | 1.000 | . | . | . | . | . | . |
| | Blk/Afro-Am. | 7.243 | 5.932 | 2.42 | 0.016 | 1.455 | 36.063 | * |
| | His/Latin | 2.644 | 2.194 | 1.17 | 0.241 | 0.520 | 13.446 | . |
| | Indigenous | 3.477 | 3.870 | 1.12 | 0.263 | 0.392 | 30.802 | . |
| | Pacific Isl | 0.947 | 4545.276 | 0.00 | 1.000 | 0.000 | . | . |
| | White | 5.359 | 4.129 | 2.18 | 0.029 | 1.183 | 24.266 | * |
| | Multi | 1.086 | 1.398 | 0.06 | 0.949 | 0.087 | 13.542 | . |
| | Other | 0.000 | 0.132 | −0.01 | 0.991 | 0.000 | . | . |
| | pell | 4.749 | 1.864 | 3.97 | 0.000 | 2.200 | 10.248 | *** |
| | major | 0.817 | 0.069 | −2.40 | 0.016 | 0.692 | 0.964 | * |
| | frst_gen | 2.285 | 0.784 | 2.41 | 0.016 | 1.166 | 4.475 | * |
| | Nav of sys | 0.699 | 0.162 | −1.54 | 0.124 | 0.444 | 1.103 | . |
| | Fam up | 0.939 | 0.193 | −0.31 | 0.759 | 0.628 | 1.404 | . |
| | Sup net | 0.953 | 0.213 | −0.21 | 0.830 | 0.615 | 1.477 | . |
| | Con cost | 0.941 | 0.179 | −0.32 | 0.750 | 0.648 | 1.366 | . |
| | Trust info | 0.741 | 0.143 | −1.55 | 0.121 | 0.508 | 1.082 | . |
| | Over bar | 1.015 | 0.187 | 0.08 | 0.934 | 0.708 | 1.457 | . |
| | Fam exp | 1.241 | 0.216 | 1.24 | 0.214 | 0.883 | 1.745 | . |
| | Coll knw | 1.172 | 0.234 | 0.79 | 0.428 | 0.792 | 1.734 | . |
| | total_knowledge | 1.119 | 0.148 | 0.85 | 0.395 | 0.863 | 1.450 | . |
| attitude1 | 1.063 | 0.073 | 0.89 | 0.373 | 0.929 | 1.216 | . | |
| unv_knw | 1.000 | 0.031 | −0.01 | 0.991 | 0.941 | 1.062 | . | |
| Constant | 0.009 | 0.016 | −2.66 | 0.008 | 0.000 | 0.289 | ** | |
| 1501–3500 | Asian | 1.000 | . | . | . | . | . | . |
| | Blk/Afro-Am. | 6.200 | 3.842 | 2.94 | 0.003 | 1.840 | 20.888 | *** |
| | His/Latin | 3.103 | 1.929 | 1.82 | 0.068 | 0.918 | 10.491 | * |
| | Indigenous | 5.970 | 4.911 | 2.17 | 0.030 | 1.191 | 29.935 | ** |
| | Pacific Isl | 1230 | 2390 | 0.01 | 0.993 | 0.000 | . | . |
| | White | 5.824 | 3.263 | 3.15 | 0.002 | 1.943 | 17.462 | ** |
| | Multi | 2.509 | 2.002 | 1.15 | 0.249 | 0.525 | 11.984 | . |
| | Other | 37.235 | 51.822 | 2.60 | 0.009 | 2.434 | 569.670 | ** |
| | pell | 2.465 | 0.690 | 3.22 | 0.001 | 1.424 | 4.265 | ** |
| | major | 0.819 | 0.054 | −3.02 | 0.003 | 0.720 | 0.932 | ** |
| | frst_gen | 2.050 | 0.553 | 2.66 | 0.008 | 1.207 | 3.479 | ** |
| | Nav of sys | 0.808 | 0.142 | −1.22 | 0.224 | 0.573 | 1.139 | . |
| | Fam up | 0.644 | 0.105 | −2.71 | 0.007 | 0.468 | 0.885 | ** |
| | Sup net | 1.333 | 0.235 | 1.63 | 0.103 | 0.944 | 1.882 | . |
| | Con cost | 1.118 | 0.168 | 0.74 | 0.457 | 0.833 | 1.501 | . |
| | Trust info | 0.871 | 0.137 | −0.88 | 0.379 | 0.640 | 1.185 | . |
| | Over bar | 1.473 | 0.222 | 2.57 | 0.010 | 1.097 | 1.979 | ** |
| | Fam exp | 1.019 | 0.134 | 0.14 | 0.885 | 0.787 | 1.319 | . |
| | Coll knw | 1.166 | 0.183 | 0.98 | 0.328 | 0.857 | 1.586 | . |
| | total_knowledge | 1.166 | 0.124 | 1.44 | 0.150 | 0.946 | 1.436 | . |
| attitude1 | 0.964 | 0.050 | −0.70 | 0.483 | 0.870 | 1.068 | . | |
| unv_knw | 0.934 | 0.023 | −2.83 | 0.005 | 0.890 | 0.979 | ** | |
| Constant | 0.444 | 0.580 | −0.62 | 0.534 | 0.034 | 5.762 | . | |
| | Asian | 1.000 | . | . | . | . | . | . |
| | Blk/Afro-Am. | 4.442 | 2.899 | 2.29 | 0.022 | 1.236 | 15.959 | * |
| | His/Latin | 2.405 | 1.532 | 1.38 | 0.168 | 0.690 | 8.383 | . |
| | Indigenous | 2.143 | 2.619 | 0.62 | 0.533 | 0.195 | 23.507 | . |
| | Pacific Isl | 2760 | 5350 | 0.01 | 0.993 | 0.000 | . | . |
| | White | 2.435 | 1.428 | 1.52 | 0.129 | 0.771 | 7.687 | . |
| Multi | 1.129 | 1.081 | 0.13 | 0.899 | 0.173 | 7.369 | . | |

Table A9. Cont.

| Range | Loans | RRR | St. Err. | t Value | p Value | [95% Conf. Interval] | | Sig |
|------------------------|-----------------|--------|-----------|---------|---------|----------------------|--------|-----|
| 3501–5500 | Other | 0.000 | 0.018 | −0.01 | 0.989 | 0.000 | . | |
| | pell | 1.465 | 0.511 | 1.09 | 0.273 | 0.740 | 2.903 | |
| | major | 1.096 | 0.102 | 0.98 | 0.325 | 0.913 | 1.317 | |
| | frst_gen | 3.792 | 1.342 | 3.77 | 0.000 | 1.895 | 7.588 | *** |
| | Nav of sys | 0.940 | 0.210 | −0.28 | 0.781 | 0.607 | 1.456 | |
| | Fam up | 0.542 | 0.114 | −2.91 | 0.004 | 0.359 | 0.819 | ** |
| | Sup net | 1.002 | 0.223 | 0.01 | 0.994 | 0.647 | 1.550 | |
| | Con cost | 1.186 | 0.229 | 0.88 | 0.378 | 0.812 | 1.731 | |
| | Trust info | 0.960 | 0.188 | −0.21 | 0.836 | 0.655 | 1.409 | |
| | Over bar | 2.063 | 0.398 | 3.76 | 0.000 | 1.414 | 3.010 | *** |
| | Fam exp | 1.047 | 0.181 | 0.27 | 0.790 | 0.747 | 1.469 | |
| | Coll knw | 0.760 | 0.158 | −1.32 | 0.186 | 0.506 | 1.142 | |
| | total_knowledge | 1.381 | 0.194 | 2.30 | 0.021 | 1.049 | 1.819 | * |
| | attitude1 | 0.984 | 0.066 | −0.24 | 0.808 | 0.862 | 1.123 | |
| | unv_knw | 1.004 | 0.033 | 0.13 | 0.899 | 0.941 | 1.071 | |
| | Constant | 0.023 | 0.040 | −2.19 | 0.028 | 0.001 | 0.671 | * |
| Above 5500 | Asian | 1.000 | . | . | . | . | . | |
| | Blk/Afro-Am. | 17.377 | 14.313 | 3.47 | 0.001 | 3.458 | 87.315 | *** |
| | His/Latin | 2.269 | 2.027 | 0.92 | 0.359 | 0.394 | 13.065 | |
| | Indigenous | 8.491 | 9.664 | 1.88 | 0.060 | 0.912 | 79.018 | |
| | Pacific Isl | 6.742 | 34541.048 | 0.00 | 1.000 | 0.000 | . | |
| | White | 4.512 | 3.519 | 1.93 | 0.053 | 0.978 | 20.805 | |
| | Multi | 6.722 | 6.417 | 2.00 | 0.046 | 1.035 | 43.655 | * |
| | Other | 0.000 | 0.035 | −0.01 | 0.990 | 0.000 | . | |
| | pell | 0.643 | 0.246 | −1.16 | 0.248 | 0.304 | 1.361 | |
| | major | 0.954 | 0.094 | −0.47 | 0.635 | 0.786 | 1.158 | |
| | frst_gen | 4.020 | 1.515 | 3.69 | 0.000 | 1.920 | 8.415 | *** |
| | Nav of sys | 1.228 | 0.310 | 0.81 | 0.415 | 0.749 | 2.014 | |
| | Fam up | 0.778 | 0.175 | −1.12 | 0.263 | 0.501 | 1.208 | |
| | Sup net | 0.952 | 0.219 | −0.21 | 0.832 | 0.607 | 1.493 | |
| | Con cost | 0.862 | 0.161 | −0.80 | 0.425 | 0.597 | 1.243 | |
| | Trust info | 1.013 | 0.208 | 0.06 | 0.951 | 0.677 | 1.514 | |
| Over bar | 2.536 | 0.535 | 4.41 | 0.000 | 1.677 | 3.835 | *** | |
| Fam exp | 0.894 | 0.156 | −0.64 | 0.523 | 0.635 | 1.260 | | |
| Coll knw | 0.846 | 0.186 | −0.76 | 0.446 | 0.550 | 1.301 | | |
| total_knowledge | 1.246 | 0.182 | 1.51 | 0.131 | 0.936 | 1.658 | | |
| attitude1 | 0.860 | 0.065 | −2.00 | 0.046 | 0.742 | 0.997 | * | |
| unv_knw | 0.996 | 0.034 | −0.12 | 0.900 | 0.931 | 1.065 | | |
| Constant | 0.236 | 0.437 | −0.78 | 0.436 | 0.006 | 8.935 | | |
| I do not receive loans | Asian | 1.000 | . | . | . | . | . | |
| | Blk/Afro-Am. | 1.000 | . | . | . | . | . | |
| | His/Latin | 1.000 | . | . | . | . | . | |
| | Indigenous | 1.000 | . | . | . | . | . | |
| | Pacific Isl | 1.000 | . | . | . | . | . | |
| | White | 1.000 | . | . | . | . | . | |
| | Multi | 1.000 | . | . | . | . | . | |
| | Other | 1.000 | . | . | . | . | . | |
| | pell | 1.000 | . | . | . | . | . | |
| | major | 1.000 | . | . | . | . | . | |
| | frst_gen | 1.000 | . | . | . | . | . | |
| | Nav of sys | 1.000 | . | . | . | . | . | |
| | Fam up | 1.000 | . | . | . | . | . | |
| | Sup net | 1.000 | . | . | . | . | . | |
| | Con cost | 1.000 | . | . | . | . | . | |
| | Trust info | 1.000 | . | . | . | . | . | |
| Over bar | 1.000 | . | . | . | . | . | | |
| Fam exp | 1.000 | . | . | . | . | . | | |

Table A9. Cont.

| Range | Loans | RRR | St. Err. | t Value | p Value | [95% Conf. Interval] | Sig |
|-------|--------------------|-------|----------|---------|----------------------|----------------------|----------|
| | Coll knw | 1.000 | . | . | . | . | . |
| | total_knowledge | 1.000 | . | . | . | . | . |
| | attitude1 | 1.000 | . | . | . | . | . |
| | unv_knw | 1.000 | . | . | . | . | . |
| | Constant | 1.000 | . | . | . | . | . |
| | Mean dependent var | | 3.738 | | SD dependent var | | 1.500 |
| | Pseudo r-squared | | 0.157 | | Number of obs | | 638.000 |
| | Chi-square | | 262.116 | | Prob > chi2 | | 0.000 |
| | Akaike crit. (AIC) | | 1588.540 | | Bayesian crit. (BIC) | | 1980.874 |
| | Cox-Snell/ML | | 0.35 | | | | |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

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