education northwest

AN EXPLORATION USING NATIONALLY REPRESENTATIVE DATA

Financial Knowledge and Basic Needs Insecurity Among Undergraduate Students

Annie Hemphill, Sam Riggs, Sara Goldrick-Rab, and Taylor Burtch

January 2025

About Education Northwest

Education Northwest is a nonprofit, nonpartisan organization dedicated to helping all children and youth reach their full potential. We partner with public, private, and community-based organizations to address educational inequities and improve student success. While most of our work centers on the Pacific Northwest, our evaluations, technical assistance, and research studies have national impact and provide timely and actionable results.

CONTACT

Education Northwest
1417 NW Everett Street, Suite 310
Portland, OR 97209
educationnorthwest.org
503.275.9500

ACKNOWLEDGMENT

This study was funded by the National Endowment for Financial Education (NEFE).

SUGGESTED CITATION

Hemphill, A., Riggs, S., Goldrick-Rab, S., & Burtch, T. (2025). *Financial knowledge and basic needs insecurity among undergraduate students: An exploration using nationally representative data.* Education Northwest.

Executive Summary

Basic needs insecurity—characterized by a lack of consistent access to food, housing, and other essentials—impacts nearly a quarter of undergraduate students attending postsecondary education institutions in the United States (U.S. Government Accountability Office, 2024). This study used nationally representative data from the most recent National Postsecondary Student Aid Survey (NPSAS:20) to examine whether increasing students' financial knowledge has the potential to reduce basic needs insecurity and improve the odds of academic success.

We started by examining college students' financial knowledge as measured by their responses to the "Big Three" financial questions on interest, inflation, and risk diversification and their experiences with food insecurity and homelessness. After establishing that students with more financial knowledge were less likely to exhibit basic needs insecurity, we used statistical techniques (regressions, including coarsened exact matching) to examine potential explanations and assess whether the relationship might be direct. We considered that possibility on average, and for specific groups of students based on the type of institution they attended, as well as their gender, race/ethnicity, and family wealth.

The findings have several implications for postsecondary education practitioners and researchers, including:

- Students who experienced higher rates of basic needs insecurity included historically marginalized students, particularly Black, Brown, and Indigenous populations, and students with less family wealth. Those students also showed lower levels of financial knowledge. These trends are often observed on college campuses and have influenced the growth of financial education.
- However, most of the relationship between financial knowledge and basic needs insecurity during college can be explained by pre-existing differences in other student characteristics and where they attend college. While the NPSAS:20 includes information on some student experiences and attributes, accounting for this information greatly diminishes the association between this type of financial knowledge and basic needs insecurity. Additionally, the data do not include pertinent information on social capital, motivation, and high school financial education courses, which could also be related to financial knowledge and basic needs insecurity and further explain the relationship.
- Moreover, we found no evidence that addressing financial knowledge would reduce inequities in basic needs insecurity. There was little variation in the relationship between the two based on institutional type, student gender, race/ethnicity, or wealth.
- These results, particularly when considered in relation to other recent program evaluations, suggest that it might be more fruitful to look beyond financial knowledge as measured by NPSAS:20 to support students' financial well-being. For example, addressing students' access to and inclusion in public benefits programs, including reducing administrative burdens, appears to have greater potential.

Providing more information about and access to social and material supports—especially housing—is also a more promising approach.

- Correspondingly, researchers ought to explore ways to expand the scope of national datasets like the NPSAS:20 to enable a more thorough exploration of students' financial ecosystems and to better understand the conditions under which strengthening those ecosystems might reduce basic needs insecurity.

Contents

Figures

Tables

Introduction

Basic needs insecurity in postsecondary education

Basic needs insecurity—characterized by a lack of consistent access to food, housing, and other resources needed for survival—impacts nearly a quarter of undergraduate students attending postsecondary education institutions in the United States (U.S. Government Accountability Office, 2024). The growing body of research on college basic needs insecurity highlights a multitude of detrimental effects, including physical and mental health problems (Broton et al., 2022; Coakley et al., 2022; Cornett, 2024; Cornett & Fletcher, 2022; Crutchfield et al., 2020; Leung et al., 2021). Unsurprisingly, students who experience basic needs insecurity also face significant, cumulative barriers to academic persistence and success.

Recent survey studies show that while students at two-year institutions are more likely to experience both homelessness and food insecurity than those attending four-year institutions, basic needs insecurity is a pervasive problem across sectors. According to the #RealCollege survey of basic needs, rates of food insecurity (measured to responses on questions such as "I worried whether my food would run out before I got money to buy more") ranged from 42 to 56 percent among respondents attending two-year institutions and from 33 to 42 percent among those attending four-year institutions. Data on housing insecurity (measured by questions such as "Did not pay full rent or mortgage") are similarly disproportionate, ranging from 46 to 60 percent among students attending two-year institutions and 35 to 48 percent among students attending four-year institutions (Baker-Smith et al., 2020). This reality has persisted since the onset of the pandemic, with nearly three in five students reporting basic needs insecurity when the same survey was administered in 2020 (The Hope Center, 2021), while more recent studies have shown rates as high as 61 and 75 percent (Affordability, Food and Housing Access Taskforce, 2023; Cargas et al., 2024; Fletcher et al., 2024).

While data exploring the relationship between basic needs insecurity and academic performance is limited, there is evidence linking basic needs insecurity to lower GPAs (Leung et al., 2021, Raskind et al., 2019; Van Woerden et al., 2019) and increased likelihood of course failure (Fletcher et al., 2024). There are also a growing number of randomized controlled trials and quasi-experimental designs demonstrating the positive impact of interventions such as basic needs resource centers, food pantries, housing vouchers, and rent subsidies on student credit accumulation, GPA, and persistence (Broton et al., 2023; Goldrick-Rab et al., 2021; Goldrick-Rab et al., 2024; Riggs & Hodara, 2024). Qualitative studies that parallel this work suggest that students experiencing basic needs insecurity struggle academically largely due to the mental trade-off between focusing on their most fundamental needs and focusing on school (Alleman et al., 2024; Goldrick-Rab, 2016; Meza et al., 2019; Wladis et al., 2024).

Building financial knowledge might be a way to address basic needs insecurity

The new economics of college are a leading driver of basic needs insecurity (Goldrick-Rab, 2016). Not only have college costs (including living expenses) outpaced many of the programs designed to financially support students (Klebs, 2020; Schak et al., 2021), purchasing power and the value of the minimum wage have declined, leaving college unaffordable even for students whose expected family contribution disqualifies them for need-based aid. This problem is exacerbated by a deterioration of public assistance programs that students have historically turned to for necessary support, as well as a systematic underfunding of institutions that leaves them unable to bridge these gaps. Income volatility, inflation, rising health care expenses, and gaping racial wealth disparities further amplify these problems, affecting students and non-students alike (Goldrick-Rab, 2016, 2023).

Many college students are tasked with navigating these challenges often before they have gained the experience to build financial knowledge, including in three areas research links to financial well-being: interest, inflation, and risk diversification (Anderson et al., 2018; Conzelmann & Lacy, 2018; Dynarski et al., 2023; Lusardi & Streeter, 2023; Lusardi & Tufano, 2015). According to Annamaria Lusardi and Olivia S. Mitchell, those "Big Three" financial questions affect financial behaviors and outcomes, including financial resilience and debt management, which can ultimately affect financial well-being. Particularly given the prominent roles that living expenses and student loans play in college financing, insufficient financial knowledge might lead to less financial well-being, therefore, exacerbating basic needs insecurity.

Subsequent studies have pointed to the role of financial knowledge in the ability of younger adults to make informed and optimal financial decisions, including those around high-cost borrowing and short- and long-term savings (Breitbach & Walstad, 2016; de Bassa Scheresberg, 2013; Fletcher et al., 2024; Lusardi & de Bassa Scheresberg, 2013; Lusardi & Mitchell, 2011a). Some evidence suggests that financial knowledge is lower among students (Al-Bahrani et al., 2020) and that it may result in higher-risk financial behavior, including underestimations of repayment costs on student loans (Artavanis & Karra, 2021). Community college students may experience compounded barriers, as they are more likely to have parents whose financial experience consists of traditional savings rather than skills that are more immediately translatable to post-secondary financing, such as credit and budgeting (Taylor et al., 2024).

According to the National Endowment for Financial Education (2024a, p.1), financial knowledge—the mastery of financial definitions, terms, and concepts—"refers to the individual's ability to act in their own self-defined, best financial interest." Financial knowledge is part of a personal finance ecosystem that buttresses financial well-being. In addition to financial knowledge, that ecosystem also includes financial actions and outcomes that require social and material supports, as well as access to a range of choices—and all of this is affected by foundational factors such as socioeconomics, family, culture, values, and beliefs. In this framework, increasing an individual's knowledge on key financial topics may improve their financial well-being. Given the many other influences, however, that relationship is far from certain.

This report used new nationally representative data to examine whether increasing students' financial knowledge (an increasingly common strategy in postsecondary education) has the potential to reduce basic needs insecurity. The inquiry was guided by the following research questions:

1. Which college students experience basic needs insecurity?
2. Which college students have financial knowledge?
3. What is the relationship between financial knowledge and basic needs insecurity?
4. Does the relationship between financial knowledge and basic needs insecurity vary by students' gender, race/ethnicity, wealth, or where they attend college?

The final question was a critical dimension of this work. Multiple systems in American economics, education, and life afford differential financial opportunities to individuals based on gender, race/ethnicity, and wealth. Moreover, American postsecondary education is deeply stratified. These structural disparities show up as differences in individuals' experiences with both basic needs insecurity and financial knowledge, although the root causes of those differences tend to lie beyond the individuals (Baradaran, 2017; Goldrick-Rab, 2016; McKenzie, 2022).

Past research on financial knowledge and basic needs insecurity among college students

A sizable body of literature points to lower rates of financial knowledge among women as compared to men, which one recent study of college students suggests cannot be explained by differences in family financial socialization, financial education, or financial behaviors (Yao et al., 2022). While some of the gap may be an artifact of measurement error (Ooi, 2020), there does appear to be a roughly 12 percentage-point gap in financial knowledge favoring men (Blanco et al., 2022). However, those estimates are limited by a binary assessment of male vs. female, even though approximately 1.6 percent of the American population and 5 percent of young adults (Brown, 2022) identify as nonbinary or transgender. Very few studies examine financial knowledge among those individuals (Rehr & Regan, 2020, being a notable exception), but when it comes to basic needs insecurity, nonbinary or transgender students experience the most substantial challenges. For example, 35 percent of genderqueer, gender-nonconforming, or other-identifying students experience food insecurity, compared to 24 percent of female students and 20 percent of male students (Goldrick-Rab, 2023). Whether those differences are related to financial knowledge or other factors, such as the way financial aid eligibility is determined, is unknown (Goldrick-Rab, 2021).

No amount of financial education is likely to circumvent the reality of systemic racism and its role in perpetuating income inequality, which is a key driver of basic needs insecurity. As activist-researcher Chloe McKenzie points out, financial knowledge is often misused as a mechanism to place undue responsibility on people of color to correct deep-rooted, structural problems (McKenzie, 2022). This weaponization

of financial struggle can result in significant financial trauma that alters the very way communities of color think and feel about financial institutions in the United States. As Sabree (2023, p.1) notes, "The refusal to participate in these systems might seem like a lack of financial knowledge on paper but could very well be tied into the response to generational mistrust and observations passed down through family units." While controlling for race cannot fully account for the realities of systemic racism and financial trauma, it is pertinent to challenging common notions of financial knowledge and accounting for some of the racialized differences in individuals' relationships to financial institutions.

Wealth also plays a substantial role in both financial knowledge and material hardship, and without addressing its role—particularly in access to the most advantageous parts of financial society—little good may result. Defined as "the value of assets owned by a family or an individual (such as a home or a savings account) minus outstanding debt (such as a mortgage or student loan)" (Pew Research Center, 2021, p.1), wealth facilitates intergenerational transfers (wherein students' expenses are absorbed by parents or other family members) (Sullivan et al., 2015). Individual and family wealth also acts as a buffer for those who encounter financial disruptions, including events such as divorce, disability, and temporary loss of employment (Rodems & Pfeffer, 2021). This private safety net may substantially shield students from basic needs insecurity in the face of unplanned financial challenges by giving them something to fall back on. Relatedly, wealth (and family wealth in particular) shares a cyclical relationship with financial knowledge, with greater wealth offering more opportunities to gain experiential financial knowledge and financial knowledge increasing the ability to both withstand disruptions and accumulate wealth (Addo, 2021; Lusardi, 2019; Lusardi & Mitchell, 2014).

Community colleges, universities, and for-profit colleges have radically different approaches to recognizing and addressing affordability among their students. They vary in terms of costs, availability of financial aid, use of other supports (such as public benefits) to help students, emergency aid funds, loan popularity (or lack thereof), and even things like the costs of keeping up with peers (Baum, 2017; Bell et al., 2023). Basic needs insecurity varies by institutional context, and financial education may be effective at addressing basic needs insecurity in contexts where costs are higher or lower. Additionally, students' enrollment in developmental coursework and/or in community colleges may serve as proxies for wealth disparities, as socioeconomic class is shown to be a strong predictor of both (Carnevale & Smith, 2018; Kisker et al., 2023; Yue et al., 2018).

In 2015, the federal government's nationally representative survey of college students (the NPSAS) began measuring students' financial knowledge with the "Big Three" financial questions (Global Financial Literacy Excellence Center, n.d.; Lusardi & Mitchell, 2011b). In their analysis of those data, Anderson and colleagues (2018) made the following observations:

1. Students had low levels of financial knowledge, with only 28 percent of the sample answering all three questions correctly.

2. Rates of financial knowledge were correlated with numerous student characteristics, including demographics (race, gender), institutional context (for-profit vs. not-for-profit), and academic performance or skill (grades, time in college, major).
3. Rates of loan literacy were higher among student borrowers, regardless of their answers to the other two questions.

These findings have led many college practitioners to focus on building students' financial knowledge and addressing basic needs insecurity. Both the Higher Education Financial Wellness Alliance and Trellis Strategies have formed strategic partnerships with state agencies and postsecondary institutions to address financial education and basic needs on college campuses (Financial Wellness Learning Collaborative, 2021; Fletcher et al., 2024; Schuman et al., 2020). That programming includes food pantries and dedicated coordinators to aid students in accessing campus resources and public benefits (Goldrick-Rab et al., 2018; Hacker, 2022; Wood, 2022).

Single Stop, one of the earliest basic needs support models, offers financial counseling along with access to public benefits, pro bono legal assistance, and tax preparation support (Zhu et al., 2018). Other examples of financial education within basic needs programs include University of California, Santa Barbara's online financial wellness modules, which cover topics ranging from navigating the housing search to "balanced eating on a budget" (University of California, Santa Barbara, n.d.), and Central Michigan University's iGrad platform, which offers self-paced education on college financing and peer coaches to help students with financial planning (Pellegrom, 2022).

Trellis was the first to examine the link between financial knowledge and basic needs insecurity, using its Student Financial Wellness Survey, which has been administered by 300 participating institutions since 2018. Analyses of the 2022 and 2023 Trellis surveys found mixed results when examining basic needs insecurity rates based on whether students answered the Big Three financial questions correctly. In 2022, while the rate of food insecurity was slightly lower for students who answered all Big Three financial questions correctly, rates of housing insecurity, and homelessness were higher among students with correct answers (Fletcher et al., 2024). Specifically, 45 percent of students who answered the Big Three financial questions correctly experienced housing insecurity and 15 percent experienced homelessness, compared to rates of 39 percent and 12 percent, respectively, for students with incorrect answers. In 2023, however, rates of basic needs and levels of financial knowledge were essentially unrelated (B. Ashton, personal communication, 2023).

As campus basic needs programming evolves to incorporate financial education, we need additional research to evaluate its implementation and effectiveness. Postsecondary leaders across the United States are working to build this body of knowledge, evaluating the role of existing programs in student persistence and success. One example of this is recent work by the Financial Wellness Learning Collaborative, driven by a partnership between Trellis and the Texas Higher Education Coordinating Board's Division for College

Readiness and Success. This collaborative, consisting of leaders from two- and four-year institutions, convened for one year to address the current state of financial education at institutions across the state. They reported that while institutions are demonstrating interest and effort in designing programs, these efforts are new and significantly under-resourced. They also reported a significant gap in research to inform design and implementation at scale (Financial Wellness Learning Collaborative, 2021; Willig et al., 2021).

Data

This study leveraged newly available student-level data from the U.S. Department of Education's National Center for Education Statistics 2019–2020 National Postsecondary Student Aid Study (NPSAS:20). This is the first nationally representative survey to assess basic needs insecurity among college students and only the second to integrate the Big Three financial questions. The NPSAS:20 includes a nationally representative sample of undergraduate students attending postsecondary institutions across all 50 states, the District of Columbia, and Puerto Rico.

The full weighted sample includes 17,096,280 undergraduate students who were enrolled in postsecondary education in the United States during the 2019–20 academic year. Most students surveyed were between the ages of 18 and 23. Almost three-fifths of the students identified as female, and slightly less than half of the students in the sample identified as white. Additional student demographic information about the sample is included in table A2 in the appendix.

The primary outcomes of interest were whether a student experienced food insecurity and or homelessness[1] within the past 30 days. NPSAS:20 measured food insecurity using 10 items from the 30-day version of the U.S. Department of Agriculture's Adult Food Security Survey (Bickel et al., 2000) which asks students about their experiences with homelessness during the 30 days prior to taking the survey.[2] The USDA recommendation for measuring food insecurity has participants refer to either past 30 days or past 12 months, and NPSAS:20 used the past 30 days. The #RealCollege (2021) surveys have done both in the past and found similar results between the two time periods. We counted students who reported low or very low food security as food insecure. Homelessness was measured using student survey responses to seven items based on the McKinney-Vento Homelessness Assistance Act. If a student answered yes to any of the items, they were counted as homeless. Students who were food insecure and/or homeless were counted as basic needs insecure.

[1] We use homelessness as our measure because NPSAS:20 does not have a specific metric of housing insecurity. Housing insecurity is the most common type of basic needs insecurity, and it is measured in the Trellis survey.

[2] Following the U.S. Department of Agriculture's standard procedures, the sum of affirmative responses to the 10 items is used to indicate the level of food security. A sum of 0 is coded as high food security, a sum of 1–2 is coded as marginal food security, a sum of 3–5 is coded as low food security, and a sum of 6–10 is coded as very low food security.

The primary indicator of interest was financial knowledge, which we measured using students' responses to the following questions based on the Big Three financial questions. Like Anderson and colleagues (2018), we used a binary measure of financial knowledge in our analysis. We compared students who answered all three questions correctly to students who did not answer all three questions correctly:

1. **Inflation.** Imagine that the interest rate on your savings account was 1 percent per year and inflation was 2 percent per year. After one year, how much would you be able to buy with the money in this account?
   Answer choices [correct answer in bold]: more than today, exactly the same, ***less than today***
2. **Interest.** Suppose you had $100 in a savings account and the interest was 2 percent per year. After five years, how much do you think you would have in the account if you left the money to grow?
   Answer choices [correct answer in bold]: ***More than $102,*** *Exactly $102, less than $102*
3. **Risk diversification.** Is this statement true or false, buying a single company's stock usually provides a safer return than a stock mutual fund?
   Answer choices [correct answer in bold]: True, ***False***

These Big Three financial questions assessed knowledge on factors including inflation, interest rates, and investment risk (Anderson et al., 2018) and have been validated and widely used as a financial knowledge measure (Lusardi & Mitchell, 2011a). When comparing the level of financial knowledge captured with these three items to other measures, research has found that they capture similar levels of knowledge (Hung et al., 2009; Lusardi & Mitchell, 2011a). For example, the RAND American Life panel tested these items against other measures such as a 70-question survey and an interactive investing exercise and found participants who answered more of these three questions correctly also performed well on the more extensive measures (Hung et al., 2009).

NPSAS:20 also provided rich information about student and institution characteristics. After extensively reviewing the full codebook and relevant literature on factors associated with financial knowledge and basic needs insecurity, we included variables in the analyses from the following categories: demographics, high school academics, college academics, wealth, financial aid, benefits, and institution type (Adamovic et al., 2020; Anderson et al., 2018; Baum, 2017; Bell et al., 2023; Payne-Sturges et al., 2018; Rodems & Pfeffer, 2021; Weaver et al., 2020; see appendix table A1 for a complete list of variables).

We approached analyses with the understanding that basic needs insecurity and financial education were intersectional issues, differing not only across individual characteristics and contexts but also at the intersections among them. Because college students' experiences with educational and financial institutions are ascribed through complex and interrelated systems of power (Collins & Bilge, 2020), we examined whether the relationship between financial knowledge and basic needs insecurity varied by students' race/ethnicity, gender, first-generation status, and institution they attended. While wealth is a complicated construct that is not readily quantifiable (Addo, 2021), we used proxies—such as student income, parents' highest education

level, receipt of a Pell grant, expected family contribution, and whether a student had quick access to $500—to foster a more holistic consideration of students' access to private resources.

Study Methodology

Descriptive analysis

We calculated descriptive statistics to answer the first two questions: which college students experienced basic needs insecurity and which college students had financial knowledge. These statistics included the percentage of students who experienced basic needs insecurity and the percentage of students who answered all Big Three financial questions correctly. The full descriptive table is included in table A2.

Regression

We estimated a series of multivariate regression models with a succession of different covariates to answer the third research question: what is the association between financial knowledge and basic needs insecurity, as indicated by a students' food security status and homelessness status. We used linear probability models for ease of interpretation of the results. The series included different covariates that represented student demographics, high school academics, college academics, wealth, financial aid, and a student's experience with benefits (see table A1 in the appendix for a list of the variables in these categories) to understand how each of these individual sets of covariates contributed to the relationship between financial knowledge and basic needs insecurity. Then we estimated a full model, including all covariates:

$$BNI_s = \beta_0 + \beta_1 FINKNOW_s + \mathbf{D}'_s + \mathbf{C}'_s + \mathbf{W}'_s + \mathbf{A}'_s + \mathbf{B}'_s + \delta + \varepsilon_s$$

BNI was a binary indicator capturing whether the student experienced food insecurity and/or homelessness in the last 30 days. **D** was a vector of student demographics characteristics. **C** was a vector of student-level college academic variables. **W** was a vector of student-level wealth indicator variables. **A** was a vector of student-level college aid variables. **B** was a vector of student-level financial benefits indicator variables. δ was an institution-level fixed effect using the institution where the student was enrolled for the majority of the 2019–20 school year. The coefficient of interest was β1, which represents the difference in the likelihood of experiencing basic needs insecurity between observationally similar students who answered all Big Three financial questions correctly and those who did not.

Matching

To further test the relationship between financial knowledge and basic needs insecurity, we also used coarsened exact matching, a strategy in which students in the treatment group (i.e., those who answered all Big Three financial questions correctly) are matched to students in the control group (i.e., those who did not

answer all Big Three financial questions correctly) when they share similar characteristics. When determining our matching variables, we ran multivariate regressions with financial knowledge as the dependent variable to identify which variables were most strongly related to financial knowledge.

Students who had different levels of financial knowledge were exact matched on gender (male); race/ethnicity (Black, Latinx, and white); college academic measures (student is a first-year undergraduate, student is a business major, student is degree seeking); wealth measures (student is a Pell recipient, student's family received federal benefits in the prior year, student filed a FAFSA); and type of institution the student attended (public two-year, public four-year, private non-profit, or private for-profit). Students who had different levels of financial knowledge were coarsened matched to students with similar college GPAs and incomes. To establish baseline equivalency, we used Cox's index for binary variables and Hedge's g for continuous indicators to ensure the effect sizes were less than 0.25 standard deviations for each matching variable (see table A6 in the appendix).

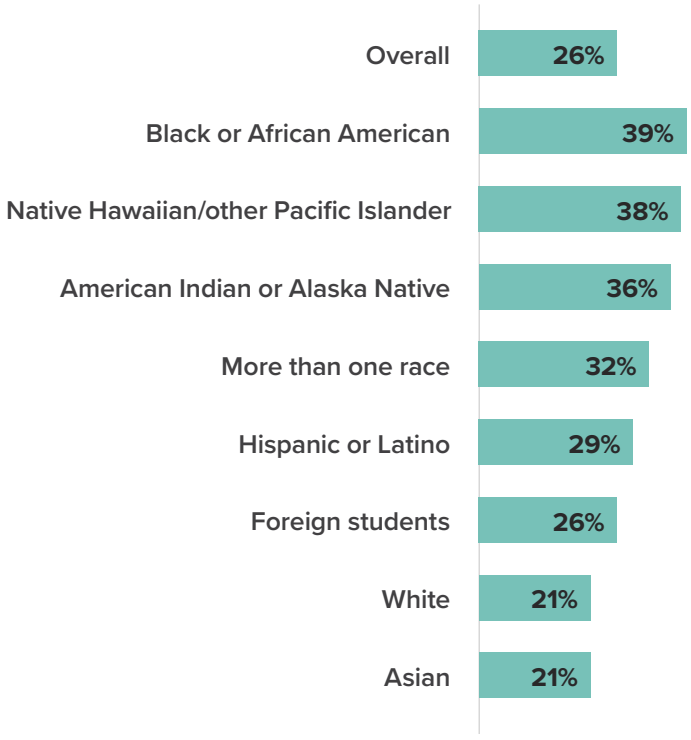
Lastly, to calculate the difference between the matched students who did and did not answer all Big Three financial questions correctly, we used a multivariate regression with analytic weights. We included the same covariates in this regression model that we included in our original regression models to control for any remaining variation between matched students. This approach may account for some of the unobservable differences between treatment and control group students that a traditional regression approach would omit.

Levels of Basic Needs Insecurity Among Undergraduate Students

Students from historically underserved groups experienced the highest levels of basic needs insecurity

Overall, 26 percent of undergraduate students experienced basic needs insecurity. Black, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, multiracial, and Latino/a/x, students had higher rates of basic needs insecurity, compared to their white and Asian peers, which is consistent with other research on basic needs insecurity. Students who identified as genderqueer, gender nonconforming, or a different identify, students who identified as not heterosexual, first-generation college students, and student parents also experienced basic needs insecurity at higher rates. There was a nonlinear relationship between student age and experiencing basic needs insecurity: Students between the ages of 24 and 29 had the highest rates of experiencing basic needs insecurity in the sample (see table A2 for more detail).

Figure 1. Percentage of students experiencing basic needs insecurity by race/ethnicity



Note: These percentages are based on the weighted sample.

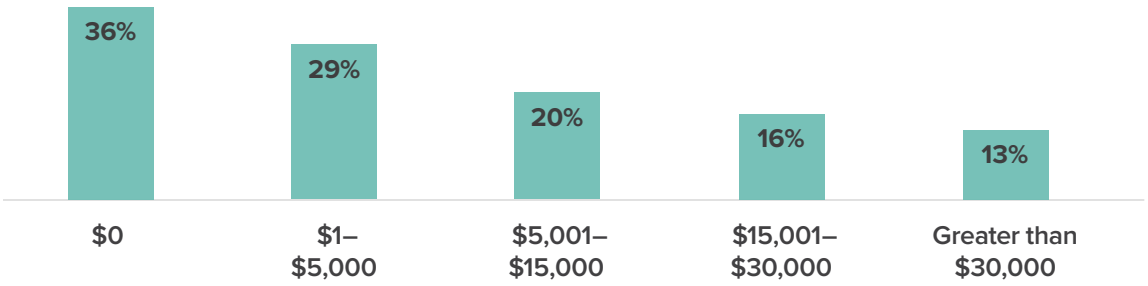
Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

We also ran a series of multivariate regressions that examined the relationship between these student characteristics and basic needs insecurity. The results from the regression analysis support the findings from the descriptive analysis showing that these factors are related to students experiencing basic needs insecurity (see table A3).

Students with higher levels of wealth and higher college GPAs had lower levels of basic needs insecurity

Additionally, students with greater wealth—as measured by parent education level, student income, expected family contribution, student's family's use of federal benefits, and financial aid received—had lower rates of basic needs insecurity. Thirty-six percent of students with an expected family contribution of $0.00 experienced basic needs insecurity compared to 13 percent with an expected family contribution greater than $30,000. There was also a negative relationship between college GPA and rates of basic needs insecurity: Students with lower GPAs had higher rates of basic needs insecurity (see table A2).

Figure 2. Percentage of students experiencing basic needs insecurity by expected family contribution



Note: These percentages are based on the weighted sample.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

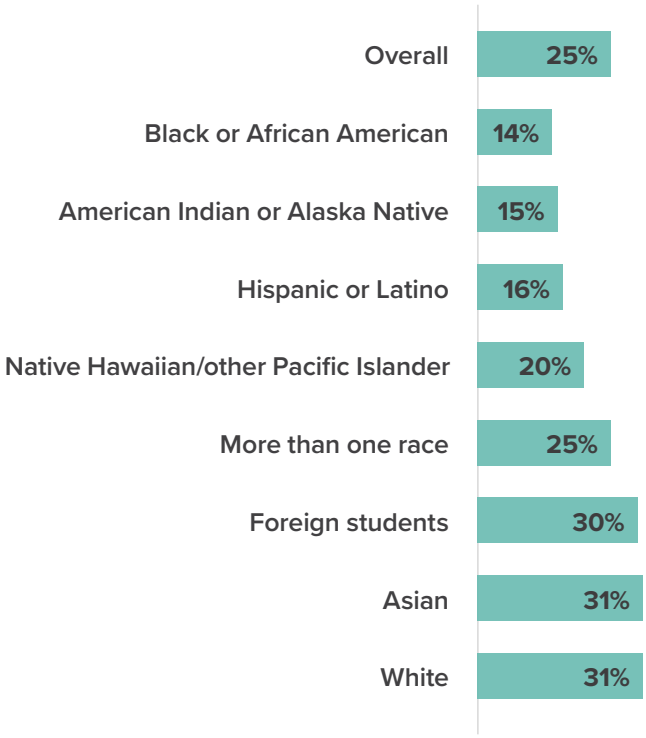
Levels of Financial Knowledge Among Undergraduate Students

Students from historically underserved groups had lower levels of financial knowledge

Overall, undergraduate students in the United States showed low levels of financial knowledge. Twenty-five percent of undergraduate students answered all Big Three financial questions correctly in the NPSAS:20. This is slightly lower than the percentage found in previous research using the 2016 NPSAS (Anderson et al., 2018).

We found similar patterns to past literature on student financial knowledge when we looked at financial knowledge levels across student demographics (see table A2). Fewer historically underserved student populations answered all three financial knowledge questions correctly. For example, the rates of financial knowledge were lower for Black, Latino/a/x, and American Indian/ Alaska Native students compared to white and Asian students (figure 3). Twenty percent of first-generation college students answered all three financial knowledge questions correctly compared to 31 percent of students who were not first generation. When examining the financial knowledge of students by gender, we found that a higher percentage of male students were financially knowledgeable (37%), followed by genderqueer students (28%), and female students (17%). This study is one of the few to shed light on the financial knowledge of genderqueer undergraduate students.

Figure 3. Percentage of students who answered all Big Three financial questions correctly by race/ethnicity

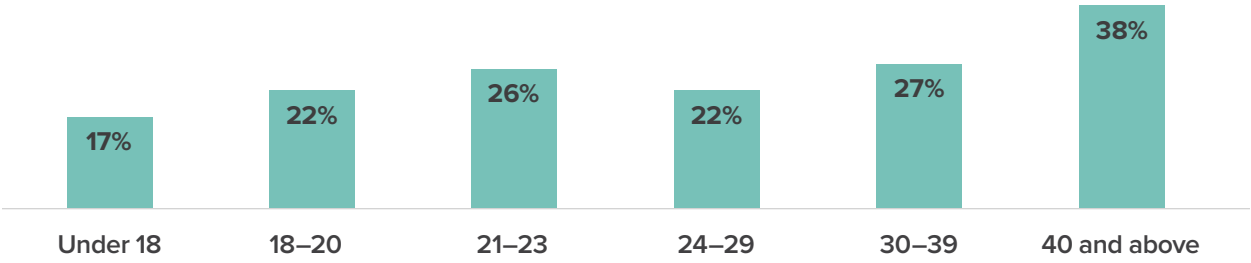


Note: These percentages are based on the weighted sample.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Older and returning students had higher levels of financial knowledge

Figure 4. Percentage of students who answered all Big Three financial questions correctly by age group



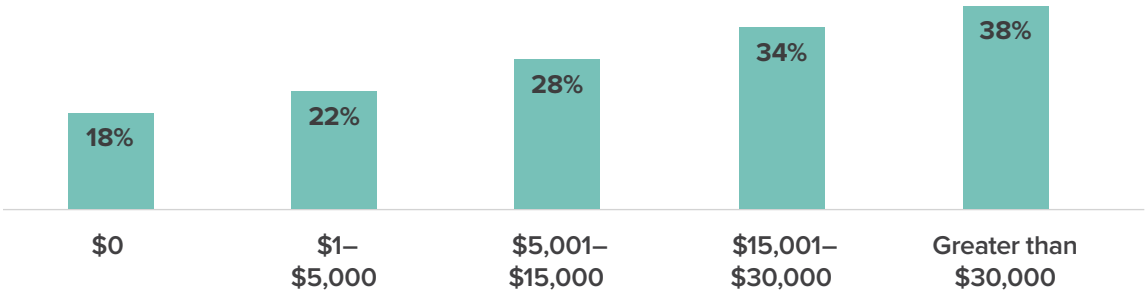
Note: These percentages are based on the weighted sample.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

A greater proportion of older students or returning students answered all three financial knowledge questions correctly. Thirty-eight percent of students ages 40 and above answered all three financial knowledge correctly compared to 17 percent of students under 18 years of age (figure 4). Additionally, more students in later class years (fourth and fifth year) answered all three financial knowledge questions correctly (34%) compared to students in their earlier years (19% of first year undergraduate students and 22% of second year undergraduate students).

Students with higher levels of wealth had higher levels of financial knowledge

Figure 5. Percentage of students who answered all Big Three financial questions correctly by expected family contribution



Note: These percentages are based on the weighted sample.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

There was also variation in financial knowledge based on students' academic experiences and wealth. Overall, a greater proportion of students with more wealth, as measured by parents' education level, student income, expected family contribution, federal benefits, and access to $500, answered all three financial knowledge questions correctly. Only 18 percent of students with $0 expected family contribution answered the Big Three financial questions correctly in comparison to 38 percent of students with greater than $30,000 expected family contribution (figure 5). This finding is closely related to our finding above: Students with $0 expected family contribution were the most likely to experience basic needs insecurity (36%), while students with expected family contributions greater than $30,000 were the least likely to experience basic needs insecurity.

In addition, a greater proportion of students who did not take remedial courses, students who were business majors, and students who were seeking a degree answered all three financial knowledge questions correctly. Lastly, there was a linear relationship between college GPA and financial knowledge: A larger proportion of students with higher GPAs answered all three financial knowledge questions correctly.

We also ran a series of multivariate regressions that examined the relationship between these student characteristics and financial knowledge (see table A4). The results supported the descriptive findings showing that these student characteristics were related to differing levels of financial knowledge.

The Relationship Between Financial Knowledge and Basic Needs Insecurity for Undergraduate Students

Students with higher levels of financial knowledge had lower levels of basic needs insecurity

Overall, students who answered the Big Three financial questions correctly experienced basic needs insecurity at lower rates than students who answered the Big Three financial questions incorrectly. This difference was largest for the question that asked about the effect of interest on savings: 25 percent of students who answered the question correctly experienced basic needs insecurity compared to 33 percent of students who answered the question incorrectly experienced basic needs insecurity. This difference was the smallest for the question that asked about the effect of inflation on purchasing.

Table 1. The percentage of students who experienced basic needs insecurity, food insecurity, or homelessness by response to each financial knowledge question

		Experiencing basic needs insecurity	Food insecure	Homeless
All three financial knowledge questions	Answered correctly	19%	16%	6%
	Did not answer correctly	29%	25%	9%
Effect of diversification on risk	Answered correctly	22%	18%	7%
	Did not answer correctly	29%	25%	8%
Effect of inflation on purchasing	Answered correctly	25%	21%	7%
	Did not answer correctly	29%	24%	9%
Effect of interest on savings	Answered correctly	25%	21%	8%
	Did not answer correctly	33%	29%	10%

Note: These percentages are based on the weighted sample.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

The relationship between financial knowledge and basic needs insecurity diminished when we accounted for student and institutional differences

Using unadjusted descriptive methods, we found that the percentage of students who experienced basic needs insecurity differed for students who did and did not answer each financial knowledge question correctly. Students who have higher levels of financial knowledge may have possessed other attributes that made them less likely to experience basic needs insecurity. For example, students with higher GPAs also tended to have higher levels of financial knowledge and lower levels of experiencing basic needs insecurity. This suggests that the descriptive differences likely confounded the relationship between financial knowledge and basic needs insecurity.

Table 2a shows the relationship between financial knowledge and basic needs insecurity when we adjusted for different combinations of student characteristics. Adjusting for student characteristics means that we included additional information about students that research has shown is associated with financial knowledge or basic needs insecurity. This way we were able to better estimate the association between financial knowledge and basic needs insecurity, independent of these other factors.

Table 2a. The relationship between financial knowledge and experiencing basic needs insecurity adjusting for difference sets of covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Answered all three financial knowledge questions correctly	-0.098*** (.0054)	-0.058*** (.0060)	-0.078*** (.0057)	-0.067*** (.0058)	-0.048*** (.0056)	-0.061*** (.0055)	-0.071*** (.0057)	-0.032*** (.0059)
Additional covariates	None	Demo-graphics	High school academics	College academics	Wealth	Aid	Benefits	All
Observations	80,690	80,690	80,690	80,690	80,690	80,690	80,690	80,690
Adjusted R-squared	.009	.073	.046	.057	.096	.070	.060	.128

Note: Table displays OLS regression coefficients with robust standard errors. *** p<0.01 communicates the results of t-tests that examine whether the coefficient is different than zero. Across all models, the dependent variable (student experiences basic needs insecurity) is regressed on an indicator measuring whether the student answered all three financial knowledge questions correctly. Models 2 through 7 each include a different set of covariates (e.g., model 2 includes demographic covariates), and model 8 includes all covariates. All models include institution fixed effects.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

The first column shows the relationship between financial knowledge and basic needs insecurity without adjusting for any other student factors. Answering all three financial knowledge questions correctly was associated with a 9.8 percentage-point decrease in the chance of a student experiencing basic needs insecurity. The stars next to the number indicate that this relationship was statistically significant at the .01 level, meaning we were 99 percent confident that the observed relationship was not due to chance.

The second column shows the relationship between financial knowledge and basic needs insecurity after adjusting for student demographics (e.g., gender, race/ethnicity, age, U.S. citizens status, first-generation college student status, marital status, sexual orientation, and if a student has children listed as dependents). Compared to the coefficient in the first column, the coefficient in the second column was smaller but still statistically significant. After adjusting for student demographic factors, answering all three financial knowledge questions correctly was associated with a 5.8 percentage-point decrease in the chance of a student experiencing basic needs insecurity. Columns 3–7 show adjustments for factors that correspond to different student characteristics (i.e., high school academics, college academics, wealth, aid, and benefits).

The final column shows results for all the factors adjusted for individually in columns 2–7. With those changes made, the relationship was reduced to a 3.2 percentage-point decrease in the chance of a student experiencing basic needs insecurity. Thus, while a statistically significant relationship remained, its practical significance waned.

Next, we used coarsened exact matching to account for some of the unobservable student characteristics that may be related to levels of financial knowledge and basic needs insecurity. Theoretically, matching on observable characteristics allowed us to account for some of the unobservable differences between students. In table 2b, we compared the coefficient from the regression model adjusting for all student factors (model 8) and the coefficient from the matching model (model 9). The results indicated the relationship further attenuated to a 2.9 percentage-point decrease in the chance of a student experiencing basic needs insecurity.

Table 2b. The relationship between financial knowledge and experiencing basic needs insecurity adjusting for difference sets of covariates

	(8) Regression with all covariates	(9) Matching with all covariates
Answered all three financial knowledge questions correctly	-0.032*** (.006)	-0.029*** (.004)
Observations	80,690	65,240
Adjusted R-squared	.128	.114

Note: Table displays OLS regression coefficients with robust standard errors. *** p<0.01 communicates the results of t-tests that examine whether the coefficient is different than zero. Across all models, the dependent variable (student experiences basic needs insecurity) is regressed on an indicator measuring whether the student answered all three financial knowledge questions correctly. Models 2 through 7 in table 2a each include an additional set of covariates (e.g., model 2 adds demographic covariates), model 8 includes all covariates, and model 9 includes all covariates on the sample that was matches using coarsened exact matching. All models include institution fixed effects. The number of observations in model 9 decreases to 65,240 because we dropped the observations that did not have a match.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Thus, the magnitude of the relationship between financial knowledge and basic needs insecurity diminished as we accounted for more differences among students. In table 2a, the strength of the relationship was reduced by nearly 70 percent from model 1, which did not include any additional controls, to model 8, which included all observable student and institutional characteristics in our data that may be related to financial knowledge and basic needs insecurity. With coarsened exact matching the coefficient was only slightly smaller. Since adjusting for observable differences alone explained so much of the relationship between financial knowledge and basic needs insecurity (i.e., the size of the coefficient for financial knowledge decreased substantially when we controlled for student and institutional characteristics), it is likely that unobservable characteristics (such as students' intrinsic motivation or access to social capital) might explain much of the remaining difference.

While increasing financial knowledge alone is not a panacea to address basic needs insecurity, these analyses point to the complex and multifaceted nature of college students' experiences with basic needs insecurity. For example, the adjusted R-squared values in table 2a showed that each individual set of covariates—especially student wealth, demographics, and experiences with financial aid—were predictive of whether students experienced basic needs insecurity.

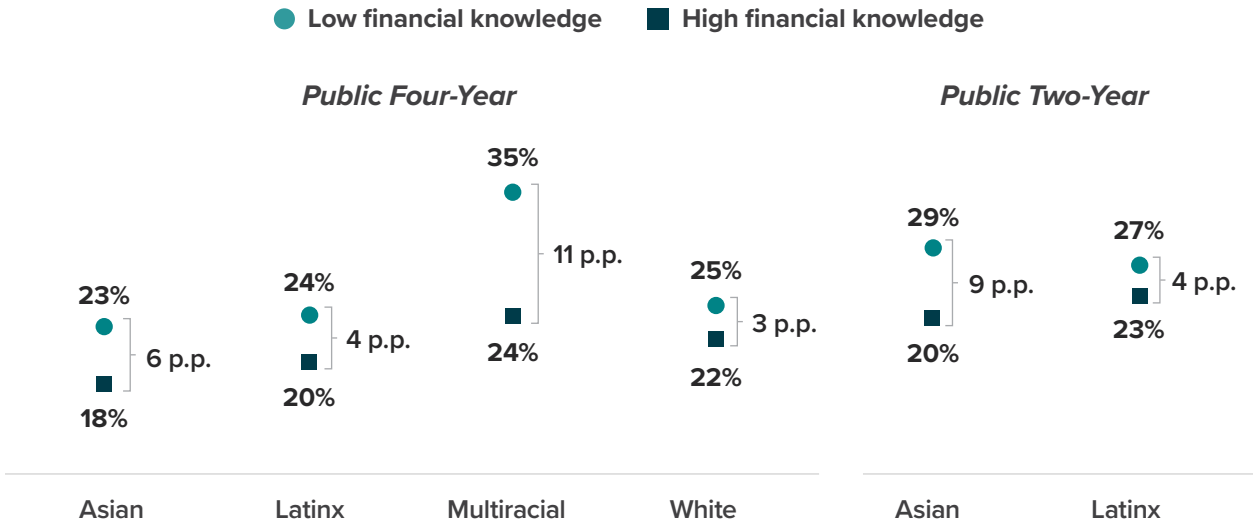
The relationship between financial knowledge and basic needs insecurity did not vary by students' gender, race, wealth, or where they attend college

In the full sample, we did not find evidence that the relationship between financial knowledge and basic needs insecurity was moderated by student gender, race/ethnicity, or wealth. Differences by institutional type were also small to non-existent. When we examined differences among students attending the same type of institution, we found that the relationship between financial knowledge and experiencing basic needs insecurity was not moderated by gender or wealth but was sometimes moderated by a student's race/ethnicity. For example, the relationship between financial knowledge and experiencing basic needs insecurity for Asian students at public two-year institutions was greater than for white students at public two-year institutions. Additionally, the relationship between financial knowledge and experiencing basic needs insecurity was greater for multiracial students at public four-year institutions than it was for white students at public four-year institutions.

When we compared students who are financially knowledgeable to those who were not but who shared the same racial/ethnic identity and attended the same type of institution, we found some evidence that financial knowledge moderated the rates of experiencing basic needs insecurity for some racial/ethnic student groups.

The findings for public four-year students (from table A7) indicate that financial knowledge was associated with lower rates of basic needs insecurity for Asian, Latino/a/x, multiracial, and white students who attend public four-year institutions (figure 6). The magnitude of the differences ranged from just under 3 percent for white students at public four-year institutions, to about 4 to 6 percent for Latinx and Asian students, and up to just over 11 percent for multiracial students. Differences were also detected for Asian and Latinx students attending public two-year institutions, with Asian and Latinx students who did not answer the Big Three financial questions correctly experiencing higher rates of basic needs insecurity.

Figure 6. Percentage of students experiencing basic needs insecurity by race at public four-year institutions and public two-year institutions based on their level of financial knowledge



Notes: This figure presents predictive margins from regression analyses that display the adjusted percentage of students who experienced basic needs insecurity by student race/ethnicity and institution type. The dark blue dots show the adjusted percentage of students who answered all Big Three financial questions correctly and experienced basic needs insecurity. The teal dot shows the adjusted percentage of students who did not answer all Big Three financial questions correctly and experienced basic needs insecurity. The percentage-point differences shown for each racial/ethnic group are statistically significant at alpha = 0.10 or lower. This figure only includes the racial/ethnic groups whose difference in statistically significant.

p.p. = percentage point

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

That said, higher rates of financial knowledge were not associated with lower rates of basic needs insecurity for the minoritized groups most at risk of experiencing basic needs insecurity: American Indian or Alaska Native, Black, and Native Hawaiian and Pacific Islanders. Students in these groups did not appear to benefit from having financial knowledge to mitigate experiencing basic needs insecurity. Students in these racial groups experience unique barriers to financial well-being because of systemic racism and historical marginalization, which makes it necessary to look more holistically at the personal finance ecosystem and look beyond building financial knowledge to support their financial well-being. Thus, while there was a modest relationship between financial knowledge and basic needs insecurity, increasing financial knowledge alone does not appear to be a promising strategy for inducing greater equity.

Study Limitations

Our findings are subject to several limitations. First, the analyses did not include a measure of housing insecurity, which is a prominent part of basic needs insecurity and might be related to financial knowledge in ways we cannot measure. While we included a measure of homelessness, a single measure cannot capture the full extent of housing insecurity students face.

Second, the measure of financial knowledge we used was limited to the Big Three financial questions in the NPSAS:20 survey. This included two of the three questions that Trellis used in its studies. While other researchers (Hung et al., 2009; Lusardi & Mitchell, 2011a) have found that these two questions are correlated with other measures of financial knowledge, our measure of financial knowledge may still be limited.

Third, to the extent that there are factors related to students' financial knowledge and basic needs insecurity that we cannot measure in our data, the findings may be biased. For example, if students with higher levels of intrinsic motivation or social capital (items we cannot measure with these data) also possess higher levels of financial knowledge and experience lower levels of basic needs insecurity, then our findings may overstate the influence of financial knowledge on basic needs insecurity. Researchers could account for these unobservable differences by implementing a randomized controlled trial. While it would not be possible to randomly assign levels of financial knowledge, future research could randomly assign financial knowledge-building interventions. However, it is unlikely that a randomized controlled trial would find a substantially larger relationship than the one we found; typically, such studies result in more precise, smaller impacts than those found in associational studies like this one.

Furthermore, the current data do not facilitate an examination of the role of financial knowledge in addressing basic needs insecurity among students with more (or less) access to mainstream financial institutions and equitable capital. It is possible that if students are included in those financial systems, financial knowledge is more effective at reducing basic needs insecurity. Racism and racial trauma are one of the "largest influence[s] on a person's wealth-building capability" yet are not captured in the data we use (McKenzie, 2022). However, the lack of inclusion is likely more common among students facing basic needs insecurity. Another limitation of our data is that it offers little insight into the meanings students ascribe to the types of financial education measured. Qualitative evidence on financial education demonstrates that students' knowledge and skillsets vary greatly and that the sources of this education matter in terms of its effects (Taylor et al., 2024).

Lastly, there is a timing component of financial knowledge interventions that this study is unable to capture. Financial knowledge may not immediately address students' food and housing insecurity, but this knowledge may help these students in the future. We are unable to observe this timing component since the level of financial knowledge and basic needs insecurity are measured at the same time.

Conclusion

This paper leveraged new nationally representative data to examine the possibility that increasing the financial knowledge of American undergraduate students—particularly about the Big Three financial questions on the topics of interest, inflation, and risk diversification—might help reduce the prevalence of food insecurity and homelessness. Rates of those basic needs insecurities are substantial in the study sample, and there is marked variation in financial knowledge. At a descriptive level, the two also appear related, such that students with more financial knowledge experience food insecurity and homelessness at substantially lower rates. Moreover, the predictors of basic needs insecurity and lower levels of financial knowledge are also similar, such that structurally marginalized populations are more likely to experience these challenges.

However, when we used statistical modeling to relate financial knowledge and basic needs insecurity, after adjusting for a host of student-level characteristics, the relationship substantially attenuated. In other words, much of the surface-level relationship between financial knowledge and basic needs insecurity disappeared after accounting for differences in students' observable characteristics. The change was so substantial that it suggests if more student characteristics were available to include in those models, they might entirely wipe out the relationship.

Since those estimates are based on averages, it is possible that they conceal important variation among students. For example, perhaps financial knowledge building is most promising for students lacking wealth, who are often at the greatest risk of basic needs insecurity. Additional analyses tested that hypothesis with a focus on variation by students' gender, race, wealth, and institution type. The results were not promising. While lower rates of basic needs insecurity were associated with higher levels of financial knowledge for some groups of students at public universities and community colleges, those groups were not the ones experiencing basic needs insecurity at the highest rates. In other words, financial knowledge does not appear to be an equity-inducing factor. Moreover, even at for-profit colleges—which enroll students with the lowest levels of financial knowledge and have the highest rates of basic needs insecurity—increased financial knowledge was unrelated to basic needs insecurity.

In summary, the results of a well-justified exploration of the potential for financial knowledge about inflation, interest, and risk diversification to meaningfully contribute to efforts to address basic needs insecurity among American college students indicate that those potentials are quite limited. There may be some modest gain from knowledge-building activities on those topics, but they are unlikely to warrant substantial investments of time or money. Instead, it may be more effective to focus on addressing the new economics of college through other aspects of the personal finance ecosystem to reduce basic needs insecurity.

For example, practitioners might instead focus on addressing students' access to and inclusion in public benefits programs, including reducing administrative burdens. Several recent evaluations suggest that this improves financial stability, reducing basic needs insecurity and sometimes also enhancing academic success (Goldrick-Rab et al., 2021; Price et al., 2014; Walsh et al., 2024). Providing more information and greater access to social and material supports, including housing, food, transportation, and emergency aid, is also a more promising approach (Baker-Smith et al., 2022).

Correspondingly, researchers ought to explore ways to expand the scope of national datasets like the NPSAS:20. For example, these datasets could be used to more thoroughly explore students' financial ecosystems and to better understand the conditions under which strengthening those ecosystems might reduce basic needs insecurity. Finally, there is a clear need for additional program evaluations on emerging models for strengthening students' personal finances.

References

Adamovic, E., Newton, P., & House, V. (2020). Food insecurity on a college campus: Prevalence, determinants, and solutions. *Journal of American College Health,* 1–7, 58–64.

Addo, F. R. (2021). *Ensuring a more equitable future: Exploring and measuring the relationship between family wealth, education debt, and wealth accumulation.* Postsecondary Value Commission.

Affordability, Food & Housing Access Taskforce. (2023). *Real College California: Basic needs among California community college students.* Community College League of California.

Al-Bahrani, A., Buser, W., & Patel, D. (2020). Early causes of financial disquiet and the gender gap in financial literacy: evidence from college students in the Southeastern United States. *Journal of Family and Economic Issues, 41,* 558–571.

Alleman, N. F., Cliburn Allen, C., & Madsen, S. E. (2024). Constructed pathways: How multiply-marginalized students navigate food insecurity at selective universities. *American Educational Research Journal, 61*(2), 328–365.

Anderson, D. M., Conzelmann, J. G., & Lacy, T. A. (2018). The state of financial knowledge in college: New evidence from a national survey. *Rand Corporation, 10.*

Artavanis, N., & Karra, S. (2021). Financial literacy and student debt. In *Financial Literacy and Responsible Finance in the FinTech Era* (pp. 86-105). Routledge.

Baker-Smith, C., Coca, V., Goldrick-Rab, S., Looker, E., Richardson, B., & Williams, T. (2020). *RealCollege 2020: Five years of evidence on campus basic needs insecurity.* The Hope Center.

Baker-Smith, C., Perez-Felkner, Goldrick-Rab, S. (2022). *Does rent-free community housing make a difference in higher education outcomes?* The Hope Center. https://saragoldrickrab.com/wp-content/uploads/2023/06/ED626832.pdf

Baum, S. (2017). College affordability and institutional pricing policies. *Planning for Higher Education, 45* (3), 68.

Bell, E., Schwegman, D., Hand, M., & DiDomenico, M. (2023). How did colleges disburse emergency aid during COVID-19? An implementation analysis of the higher education emergency relief fund. *Educational Researcher, 52*(5), 259–271.

Bickel, G., Nord, M., Price, C., Hamilton, W., Cook, J., (2000). *Guide to measuring household food security, revised 2000.* U.S. Department of Agriculture, Food and Nutrition Service.

Blanco, L., Garcia, C., & Gutierrex, R. (2022). *Systemic review of racial, ethnic, and gender differences on financial knowledge in the United States* [School of Public Policy Working Papers, Paper 80]. Pepperdine University.

Baradaran, M. (2017). *The color of money: Black banks and the racial wealth gap.* Harvard University Press.

Breitbach, E., & Walstad, W. B. (2016). Financial literacy and financial behavior among young adults in the United States. *Economic competence and financial literacy of young adults—status and challenges*. Verlag Barbara Budrich, Opladen, 81–100.

Broton, K. M., Mohebali, M., & Goldrick-Rab, S. (2023). Meal vouchers matter for academic attainment: A community college field experiment. *Educational Researcher, 52*(3), 155–163.

Broton, K. M., Mohebali, M., & Lingo, M. D. (2022). Basic needs insecurity and mental health: Community college students' dual challenges and use of social support. *Community College Review, 50*(4), 456–482.

Brown, A. (2022, June). *About 5% of young adults in the U.S. say their gender is different from their sex assigned at birth.* Pew Research Center. https://www.pewresearch.org/short-reads/2022/06/07/about-5-of-young-adults-in-the-u-s-say-their-gender-is-different-from-their-sex-assigned-at-birth/

Cameron, M., Johnson, R., Lacy, T.A., Wu, J., Siegel, P., Holley, J., & Wine, J. (2023). *2019–20 National Postsecondary Student Aid Study (NPSAS:20): First look at student financial aid estimates for 2019–20* (NCES 2023-466). National Center for Education Statistics, U.S. Department of Education.

Cargas, S., Neel, A., Thomas, T., Gonzalez-Pacheco, D., Trujillo, P., Coakley, K., Allocca, A. (2024). *New Mexico higher education: 2023-2024 students basic needs report*. The University of New Mexico Basic Needs Project.

Carnevale, A. P., & Smith, N. (2018). Balancing work and learning: Implications for low-income students.

Coakley, K. E., Cargas, S., Walsh-Dilley, M., & Mechler, H. (2022). Basic needs insecurities are associated with anxiety, depression, and poor health among university students in the state of New Mexico. *Journal of Community Health, 47*(3), 454–463.

Collins, P. H., & Bilge, S. (2020). *Intersectionality.* John Wiley & Sons.

Conzelmann, J. G., & Lacy, T. A. (2018, October 15). *Financial and student loan (il)literacy among US college students*. Brookings Institution. https://www.brookings.edu/articles/financial-and-student-loan-illiteracy-among-us-college-students/

Cornett, A. (2024). *Balancing act: Understanding the intersection of basic needs and mental wellbeing in college*. Trellis Strategies.

Cornett, A., & Fletcher, C. (2022). The impacts of COVID-19 on the experiences of students with basic needs insecurity: Evidence from a national survey. *Journal of Student Financial Aid, 51*(1).

Cox, B. G. (1980). The weighted sequential hot deck imputation procedure. In *JSM Proceedings, Survey Research Methods Section,* (pp 721–726). American Statistical Association. http://www.asasrms.org/Proceedings/papers/1980_152.pdf

Crutchfield, R. M., Carpena, A., McCloyn, T. N., & Maguire, J. (2020). The starving student narrative: How normalizing deprivation reinforces basic need insecurity in higher education. *Families in Society, 101*(3), 409–421.

de Bassa Scheresberg, C. (2013). Financial literacy and financial behavior among young adults: Evidence and implications. *Numeracy, 6*(2), 5.

Dynarski, S., Page, L., & Scott-Clayton, J. (2023). College costs, financial aid, and student decisions. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education* (Vol. 7, pp. 227–285). Elsevier.

Financial Wellness Learning Collaborative. (2021). *Understanding and promoting student financial wellness: A report from the Financial Wellness Learning Collaborative.* Texas Higher Education Coordinating Board.

Fletcher, C., Cornett, A., & Ashton, B. (2024). *Student Financial Wellness Survey report: Fall 2023.* Trellis Strategies. https://www.trellisstrategies.org/research-studies/student-financial-wellness-survey-fall-2023-semester-results/

Global Financial Literacy Excellence Center. (n.d.). *Three questions to measure financial literacy.* https://gflec.org/wp-content/uploads/2015/04/3-Questions-Article2.pdf

Goldrick-Rab, S. (2016). *Paying the price: College costs, financial aid, and the betrayal of the American dream.* University of Chicago Press.

Goldrick-Rab, S. (2021, May). Opinion: It's time to stop using the FAFSA to determine who gets emergency aid: The pandemic has ushered in a new era of uncertainty for students that defies this federal form. *The Hechinger Report.* https://hechingerreport.org/opinion-its-time-to-stop-using-the-fafsa-to-determine-who-gets-emergency-aid/

Goldrick-Rab, S. (2023). *Food insecurity and homeless in American higher education: An overview of new nationally representative estimates.* Education Northwest.

Goldrick-Rab, S., Clark, K., Baker-Smith, C., & Witherspoon, C. (2021). *Support the whole community college student: The impact of nudging for basic needs insecurity.* The Hope Center. https://saragoldrickrab.com/wp-content/uploads/2023/06/ARC_ImpactPaper_final_10_4.pdf

Goldrick-Rab, S., Baker-Smith, C., Cordes, S. A., & Clark, K. (2024). *Homelessness and housing insecurity among community college students.* Education Northwest.

Goldrick-Rab, S., Cady, C., & Coca, V. (2018). *Campus food pantries: Insights from a national survey.* The Hope Center.

Goldrick-Rab, S., Clark, K., Baker-Smith, C., & Witherspoon, C. (2021). *Supporting the whole community college student: The impact of nudging for basic needs security.* The Hope Center.

Hacker, N. J. (2022). Basic needs insecurity affects student success and physical and emotional health: How can we address it on college campuses? *CommonHealth, 3*(1), 40–46.

Hung, A., Parker, A. M., & Yoong, J. (2009). *Defining and measuring financial literacy* (WR-708). RAND Corporation.

Kisker, C. B., Cohen, A. M., & Brawer, F. B. (2023). *The American community college.* John Wiley & Sons.

Klebs, S. (2020, July 20). *Why we should double the Pell grant.* Thirdway. https://www.thirdway.org/memo/why-we-should-double-the-pell-grant

Leung, C. W., Farooqui, S., Wolfson, J. A., & Cohen, A. J. (2021). Understanding the cumulative burden of basic needs insecurities: Associations with health and academic achievement among college students. *American Journal of Health Promotion, 35*(2), 275–278.

Lusardi, A. (2019). Financial literacy and the need for financial education: evidence and implications. *Swiss Journal of Economics and Statistics, 155*(1), 1–8.

Lusardi, A., & de Bassa Scheresberg, C. (2013). *Financial literacy and high-cost borrowing in the United States* (No. w18969). National Bureau of Economic Research.

Lusardi, A., & Mitchell, O. S. (2011a). Financial literacy and retirement planning in the United States. *Journal of Pension Economics & Finance, 10*(4), 509–525.

Lusardi, A., & Mitchell, O. S. (2011b). Financial literacy around the world: an overview. *Journal of Pension Economics & Finance, 10*(4), 497–508.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *American Economic Journal: Journal of Economic Literature, 52*(1), 5-44.

Lusardi, A. & Streeter, J. L. (2023) Financial literacy and financial well-being: Evidence from the US. *Journal of Financial Literacy and Wellbeing, 1*(2), 169–198.

Lusardi, A. & Tufano, P. (2015) Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics & Finance, 14*(4), 332–368.

McKenzie, C. (2022, August 16). *Understanding racial trauma's impact on financial literacy.* National Endowment for Financial Education. https://www.nefe.org/news/2022/08/understanding-racial-traumas-impact-on-financial-literacy.aspx

Meza, A., Altman, E., Martinez, S., & Leung, C. W. (2019). "It's a feeling that one is not worth food": A qualitative study exploring the psychosocial experience and academic consequences of food insecurity among college students. *Journal of the Academy of Nutrition and Dietetics, 119*(10), 1713–1721.

National Endowment for Financial Education (NEFE). (2024a) *Core concept: Financial knowledge and access*. https://www.nefe.org/initiatives/ecosystem/financial-knowledge.aspx#:~:text=It%20is%20comprised%20of%20two,financial%20definitions%2C%20terms%20and%20concepts

National Endowment for Financial Education (NEFE). (2024b) *The personal finance ecosystem.* https://www.nefe.org/initiatives/ecosystem/default.aspx

Ooi, E. (2020). Give mind to the gap: Measuring gender differences in financial knowledge. *The Journal of Consumer Affairs, 54*(3), 931–950.

Payne-Sturges, D. C., Tjaden, A., Caldeira, K. M., Vincent, K. B., & Arria, A. M. (2018). Student hunger on campus: Food insecurity among college students and implications for academic institutions. *American Journal of Health Promotion, 32*(2), 349–354.

Pellegrom, L. (2022, March 16). *iGrad offers tools for financial success*. Central Michigan University. https://www.cmich.edu/news/details/igrad-offers-tools-for-financial-success

Pew Research Center. (2021, July 23). '*What's the difference between income and wealth?' and other common questions about economic concepts.* https://www.pewresearch.org/decoded/2021/07/23/whats-the-difference-between-income-and-wealth-and-other-common-questions-about-economic-concepts/

Price, D., Long, M., Quast, S. S., McMaken, J., & Kioukis, G. (2014). *Public benefits and community colleges: Lessons from the benefits access for college completion evaluation.* OMG Center for Collaborative Learning. https://saragoldrickrab.com/wp-content/uploads/2023/08/BACC-Final-Report-FINAL-111914-1.pdf

Raskind, I. G., Haardörfer, R., & Berg, C. J. (2019). Food insecurity, psychosocial health and academic performance among college and university students in Georgia, USA. *Public Health Nutrition, 22*(3), 476–485.

Rehr, T. I., & Regan, E. P. (2020). An exploratory analysis of financial wellness of trans-spectrum college students. *Journal of LGBT Youth, 19*(1), 76–91.

Riggs, S. & Hodara, M. (2024). *Exploring the reach and impact of basic needs services at postsecondary institutions: Learnings from a multi-state evaluation in 2020–21 and 2021–22.* Education Northwest. https://educationnorthwest.org/sites/default/files/pdf/ecme-bni-evaluation-report-two-508c.pdf

Rodems, R., & Pfeffer, F. T. (2021). Avoiding material hardship: The buffer function of wealth. *Journal of European Social Policy, 31*(5), 517–532.

Sabree, R. (2023, April 4). Financial trauma is real: Why black people should consider financial therapy. *Forbes.* https://www.forbes.com/sites/rahkimsabree/2023/04/01/financial-trauma-is-real-why-black-people-should-consider-financial-therapy/

Schak, J. O., Wong, N., & Fung, A. (2021). *Student debt and the class of 2020: 16th Annual report*. Project on Student Debt.

Schuman, P., Ashton, B., Serna, K., & Taylor, Z. W. (2020). *Higher Education Financial Wellness Alliance (HEFWA) survey of financial wellness programs in higher education 2020*. Higher Education Financial Wellness Alliance.

Sullivan, L., Meschede, T., Dietrich, L., Shapiro, T. M., Traub, A., Ruetschlin, C., & Draut, T. (2015). *The racial wealth gap: Why policy matters*. Dēmos and Institute for Assets & Social Policy at Brandeis University. https://www.demos.org/research/racial-wealth-gap-why-policy-matters

Taylor, Z. W., Serna, K. L., Eguiluz, L., & Marois, M. (2024). "Through their fingers like water": How community college students view family as sources of financial education. *Community College Journal of Research and Practice, 48*(2), 88–104.

The Hope Center. (2021). *#RealCollege 2021: Basic needs insecurity during the ongoing pandemic*.

Trellis Company. (n.d.). *Student financial education webinars*. https://www.trelliscompany.org/student-success-support/trellis-company-webinars/

University of California, Santa Barbara. (n.d.). *Basic needs: Financial resources* [web page]. https://basicneeds.ucsb.edu/resources/financial/financial-wellness-modules

U.S. Government Accountability Office. (2024). *Supplemental nutrition assistance program: Estimated eligibility and receipt among food insecure college students* (Report no. GAO-24-107074. https://www.gao.gov/products/gao-24-107074

Van Woerden, I., Hruschka, D., & Bruening, M. (2019). Food insecurity negatively impacts academic performance. *Journal of Public Affairs, 19*(3), e1864.

Walsh, S., Hetling, A., Riddick, S. & Rodriguez, S. (2024). Assessing utilization and accessibility of public cash assistance benefits among postsecondary students. *The Review of Higher Education, 48,* 29–59.

Weaver, R. R., Vaughn, N. A., Hendricks, S. P., McPherson-Myers, P. E., Jia, Q., Willis, S. L., & Rescigno, K. P. (2020). University student food insecurity and academic performance. *Journal of American College Health, 68*(7), 727–733.

Willig, E., Ashton, B., & Taylor, Z. W. (2021). *Understanding and promoting student financial wellness: A report from the Financial Wellness Learning Collaborative*. Texas Higher Education Coordinating Board. https://files.eric.ed.gov/fulltext/ED615895.pdf

Wladis, C., Fay, M. P., & Hachey, A. C. (2024). The holistic capital model: Time and body capital as sources of inequity. *AERA Open, 10,* 23328584241255626.

Wood, S. (2022, March 16). How colleges are addressing food insecurity. *US News & World Report*. https://www.usnews.com/education/articles/how-colleges-are-addressing-food-insecurity

Yao, M., Rehr, T. I., & Regan, E. P. (2022). Gender differences in financial knowledge among college students: Evidence from a recent multi-institutional survey. *Journal or Family and Economic Issues, 44,* 693–713.

Yue, H., Rico, R. S., Vang, M. K., & Giuffrida, T. A. (2018). Supplemental instruction: Helping disadvantaged students reduce performance gap. *Journal of Developmental Education,* 18–25.

Zhu, J., Harnett, S., & Scuello, M. (2018) *Single stop final impact and implementation report.* Metis Associates.

Appendix

NPSAS:20 dataset

NPSAS:20 measures two aspects of basic needs insecurity: food insecurity and homelessness. We used homelessness as our measure because NPSAS:20 does not have a specific metric of housing insecurity. Food insecurity is assessed using the 10 items from the 30-day version of the U.S. Department of Agriculture's Adult Food Security Survey (Bickel et al., 2000). Following these standard procedures, the sum of affirmative responses to the 10 items is used to indicate the level of food security. A sum of 0 is coded as high food security, a sum of 1–2 is coded as marginal food security, a sum of 3–5 is coded as low food security, and a sum of 6–10 is coded as very low food security. We counted students who reported low or very low food security as food insecure for the analysis.

NPSAS:20 measures homelessness using student survey responses to seven items based on the McKinney-Vento Homelessness Assistance Act. These questions assess whether a student experienced homelessness at some point in the 30 days prior to taking the survey. Students who indicate low food security, very low food security, or homelessness in the survey items above were counted as basic needs insecure for our analysis.

To ensure that student respondents represented the target population, we used population weights provided in the NPSAS:20 dataset. A student sampling weight and institution sampling weight compensate for the unequal probability of student and institution selection, respectively. The institution sampling weight was adjusted poststratification for nonresponse and coverage, and the student sampling weight was adjusted for students attending more than one institution in the 2019–20 school year. Furthermore, the institution-level poststratification adjustments incorporate student enrollment at the institution level because NPSAS:20 statistical inferences are at the student level.

Measures used for this project come from a cross-sectional student survey with an unweighted response rate of 58 percent and a weighted response rate of 62 percent. In total, the survey includes 80,690 undergraduates attending approximately 2,200 institutions; after weighting this represents 17.1 million undergraduate students enrolled between July 1, 2019, and June 30, 2020, at all Title IV eligible institutions.

NPSAS:20 stochastically imputed student answers if students did not answer survey items. The overall response rates to each of the financial knowledge items were 94.4, 94.5, and 94.7 percent, and the response rates to the homelessness and food insecurity questions were 98.1 and 98.3 percent, respectively. According to Cameron and colleagues (2023), missing responses were imputed by logical imputation where variables were prioritized for imputation based on level of missingness. In this process, the NPSAS:20 staff first identified student characteristics that were related to the variable of interest with missing values then identified a "donor" student with similar characteristics and replicated their response to the skipped survey questions

(Cox, 1980). The same "donor student" could be a donor to multiple students with missing responses. Imputed values can shrink the variance in analysis, but since only a small percentage of the responses from the items of interests were imputed, we decided to keep the imputed values in the analysis.

Full analysis tables

Table A1. Variables included in each category of covariates

Variable category	Variable
Demographics	Gender
	Age
	U.S. citizen status
	Relationship status
	First-generation college student
	Race/ethnicity
	Sexual orientation
	Student parent status
High school academics	Took remedial courses
College academics	College major (specifically business major)
	Degree seeking
	Year of study
	College GPA
Wealth	Parent education level
	Student income
	Expected family contribution (EFC)
	Access to $500 (indicates students' level of confidence in their ability to hypothetically come up with $500 in a months' time)
Financial aid	Student applied for federal financial aid for 2019–20
	Federal work study amount
	Federal work study recipient
	Total loan amount received
	Student is a loan recipient
	Total grants awarded
	Student is a grant recipient

Variable category	Variable
Benefits	Recipient of federal benefits (SNAP, FRPL, TANF, WIC)
	Recipient of an athletic scholarship
	Student is classified as a veteran for federal aid reasons
Institution type	Public two-year
	Public four-year
	Private nonprofit
	Private for-profit

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Table A2. Characteristics of undergraduate students included in NPSAS:20

Group	Category	Percentage of students who answered all Big Three financial questions correctly	Percentage of students who are experiencing basic needs insecurity
All students		25%	26%
Gender	Male	37%	24%
	Female	17%	28%
	Genderqueer, gender nonconforming, or a different identity	28%	39%
Student race/ ethnicity	American Indian or Alaska Native	15%	36%
	Asian	31%	21%
	Black or African American	14%	39%
	Foreign students	30%	26%
	Hispanic or Latino	16%	29%
	Native Hawaiian/other Pacific Islander	20%	38%
	More than one race	25%	32%
	White	31%	21%

Group	Category	Percentage of students who answered all Big Three financial questions correctly	Percentage of students who are experiencing basic needs insecurity
Age	Under 18	17%	23%
	18–20	22%	23%
	21–23	26%	26%
	24–29	22%	31%
	30–39	27%	30%
	40 and above	38%	26%
Citizenship	Yes	25%	26%
	No	25%	29%
Marital status: Single	Yes	24%	27%
	No	33%	20%
First-generation college student	Yes	20%	31%
	No	31%	21%
Sexual orientation	Heterosexual	26%	25%
	Not Heterosexual	21%	35%
Dependents: Has dependent children	Yes	22%	32%
	No	26%	25%
Class level	1st year undergrad	19%	30%
	2nd year undergrad	22%	26%
	3rd year undergrad	29%	25%
	4th or 5th year undergrad	34%	23%
	Unclassified undergrad	31%	19%
Remedial courses: Took in 2019–20	Yes	16%	32%
	No	26%	26%
Business major	Yes	36%	25%
	No	23%	27%

Group	Category	Percentage of students who answered all Big Three financial questions correctly	Percentage of students who are experiencing basic needs insecurity
Degree seeking	Yes	36%	27%
	No	25%	17%
College GPA	0.0–2.0	16%	36%
	2.0–3.0	20%	31%
	3.0–3.5	24%	27%
	3.5–4.0	31%	20%
Parents' highest education level	Did not complete high school	17%	33%
	High school diploma or equivalent	19%	31%
	Vocational/ technical training	21%	31%
	Associate degree	21%	29%
	Some college but no degree	21%	30%
	Bachelor's degree	29%	22%
	Master's degree or equivalent	32%	21%
	Doctoral degree	39%	19%
Student income	$0	21%	27%
	$1–$5,000	26%	25%
	$5,001–$15,000	24%	29%
	$15,001–$30,000	22%	31%
	Greater than $30,000	35%	19%
Financial security: Access to $500 within the next month	Yes	28%	21%
	No	14%	49%

Group	Category	Percentage of students who answered all Big Three financial questions correctly	Percentage of students who are experiencing basic needs insecurity
Expected family contribution	$0	18%	36%
	$1–$5,000	22%	29%
	$5,001–$15,000	28%	20%
	$15,001–$30,000	34%	16%
	Greater than $30,000	38%	13%
Applied for federal aid	Yes	21%	30%
	No	33%	17%
Received federal work study	Yes	24%	28%
	No	25%	26%
Received loans	Yes	22%	33%
	No	27%	23%
Total loans received	$0	27%	23%
	$1–$5,000	21%	35%
	$5,001–$10,000	22%	31%
	Greater than $10,000	23%	34%
Received grants	Yes	23%	29%
	No	29%	21%
Total grants received	$0	29%	21%
	$1–$5,000	22%	31%
	$5,001–$10,000	20%	31%
	Greater than $10,000	27%	26%

Group	Category	Percentage of students who answered all Big Three financial questions correctly	Percentage of students who are experiencing basic needs insecurity
Received a federal benefit in the household in 2017–18	Yes	19%	34%
	No	29%	21%

Note: These percentages are based on the weighted sample. Due to rounding, some of the total of all categories within a group may not add up to the "All students" total.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Table A3. The relationship between student characteristics and experiencing basic needs insecurity

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Female	0.00672 (0.00493)						-0.00685 (0.00477)
Genderqueer	0.0779*** (0.0249)						0.0606*** (0.0234)
Age of student	0.000517 (0.000450)						0.00166*** (0.000450)
Not U.S. citizen	-0.0331** (0.0131)						-0.0343*** (0.0125)
Married	0.113*** (0.00984)						0.0700*** (0.00933)
First-generation college student	0.0684*** (0.00607)						0.0319** (0.0144)
American Indian/Alaska Native student	0.0713* (0.0370)						0.0435 (0.0362)
Asian student	0.00451 (0.00984)						-0.00861 (0.00940)
Black student	0.124*** (0.00992)						0.0611*** (0.00958)
Foreign student	0.0443** (0.0197)						0.0806*** (0.0197)
Latinx student	0.0348*** (0.00818)						0.00130 (0.00795)

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Native Hawaiian/ Pacific Islander student	0.150*** (0.0404)						0.102*** (0.0369)
Multiracial student	0.0825*** (0.0122)						0.0603*** (0.0119)
Heterosexual	-0.100*** (0.00813)						-0.0876*** (0.00781)
Student parent with dependent child	0.0729*** (0.00918)						0.0276*** (0.00890)
Took remedial courses		-0.0953*** (0.00632)					
Business major			-0.0209*** (0.00740)				-0.000197 (0.00675)
Degree seeking			0.0663*** (0.0170)				0.0214 (0.0165)
Second-year undergraduate student			-0.0209*** (0.00656)				-0.0111* (0.00623)
Third-year undergraduate student			-0.0184* (0.00978)				-0.0101 (0.00919)
Fourth- or fifth-year undergraduate student			-0.0283*** (0.00767)				-0.00769 (0.00772)
Unclassified undergraduate student			-0.0716*** (0.0166)				0.00703 (0.0164)
College GPA			-0.0681*** (0.00436)				-0.0412*** (0.00413)

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Parent education: High school degree			-0.00811 (0.0112)			-0.00827 (0.0112)	
Parent education: Vocational degree			0.00384 (0.0152)			0.00782 (0.0151)	
Parent education: Associate degree			-0.0212 (0.0135)			-0.0163 (0.0133)	
Parent education: Some college			-0.0145 (0.0117)			-0.0129 (0.0119)	
Parent education: Bachelor's degree			-0.0641*** (0.0106)			-0.00907 (0.0105)	
Parent education: Master's degree			-0.0627*** (0.0116)			-0.00312 (0.0108)	
Parent education: Doctoral degree			-0.0699*** (0.0145)				
Student income				-9.29e-07*** (1.04e-07)			-3.97e-07*** (1.08e-07)
Access to $500				-0.236*** (0.00736)			-0.201*** (0.00722)
Expected family contribution				-6.55e-07*** (6.57e-08)			-3.00e-07*** (5.03e-08)
Submitted a FAFSA					0.0351*** (0.00720)		0.0284*** (0.00709)
Received Pell grant					0.111*** (0.00686)		0.0456*** (0.00687)

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Received federal work study					-0.0212 (0.0227)		-0.0221 (0.0216)
Total federal work study received					7.55e-06 (8.28e-06)		8.00e-06 (7.74e-06)
Received loans					0.0700*** (0.00819)		0.0499*** (0.00790)
Total loans received					1.28e-06* (7.10e-07)		1.81e-06*** (6.79e-07)
Received grants					-0.0142** (0.00721)		-0.00553 (0.00670)
Total grants received					-2.78e-08 (3.55e-07)		-2.64e-08 (3.20e-07)
Received any federal benefit						0.116*** (0.00579)	0.0473*** (0.00605)
Received federal veteran benefits						-0.0233 (0.0169)	0.00558 (0.0164)
Received athletic scholarship						0.00101 (0.0203)	0.00910 (0.0192)
Constant	0.106*** (0.0238)	0.277*** (0.000955)	0.462*** (0.0227)	0.516*** (0.0113)	0.110*** (0.00744)	0.219*** (0.00587)	0.356*** (0.0356)
Observations	80,690	80,690	80,690	80,690	80,690	80,690	80,690
Adjusted R-squared	0.070	0.041	0.053	0.094	0.067	0.055	0.127

Note: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors are in parentheses.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Table A4. The relationship between student characteristics and financial knowledge

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Female	-0.183*** (0.00582)						-0.177*** (0.00574)
Genderqueer	-0.0788*** (0.0243)						-0.0727*** (0.0238)
Age of student	0.00792*** (0.000413)						0.00657*** (0.000442)
Not U.S. citizen	0.0228** (0.0111)						0.0268** (0.0108)
Married	-0.0591*** (0.00883)						-0.0385*** (0.00885)
First-generation college student	-0.0554*** (0.00517)						-0.0559*** (0.0137)
American Indian/Alaska Native student	-0.111*** (0.0281)						-0.0926*** (0.0276)
Asian student	-0.0141 (0.0115)						-0.00958 (0.0113)
Black student	-0.116*** (0.00762)						-0.0848*** (0.00756)
Foreign student	-0.0264 (0.0209)						-0.0430** (0.0210)
Latinx student	-0.0853*** (0.00681)						-0.0702*** (0.00698)

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Native Hawaiian/Pacific Islander student	-0.0876** (0.0346)						-0.0736** (0.0334)
Multiracial student	-0.0410*** (0.0109)						-0.0293*** (0.0108)
Heterosexual	0.0220*** (0.00667)						0.0128* (0.00657)
Student parent with dependent child	-0.0381*** (0.00718)						-0.0235*** (0.00737)
Took a remedial course		-0.0711*** (0.00789)					-0.0302*** (0.00768)
Business major			0.125*** (0.00841)				0.0948*** (0.00816)
Degree seeking			-0.110*** (0.0200)				-0.0639*** (0.0193)
Second-year undergraduate student			0.0184*** (0.00571)				0.00506 (0.00566)
Third-year undergraduate students			0.0523*** (0.00892)				0.0327*** (0.00842)
Fourth- or fifth-year undergraduate student			0.0930*** (0.00885)				0.0483*** (0.00850)
Unclassified undergraduate student			0.0865*** (0.0204)				-0.00695 (0.0192)

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
College GPA			0.0528***				0.0388***
			(0.00411)				(0.00375)
Parent education: High school degree				0.00615			-0.0136
				(0.00917)			(0.00888)
Parent education: Vocational degree				0.0118			-0.0134
				(0.0131)			(0.0124)
Parent education: Associate degree				0.0122			-0.00521
				(0.0117)			(0.0116)
Parent education: Some college				0.0117			0.00191
				(0.00906)			(0.00941)
Parent education: Bachelor's degree				0.0635***			-0.0310***
				(0.00920)			(0.0112)
Parent education: Master's degree				0.0844***			-0.0102
				(0.0106)			(0.0124)
Parent education: Doctoral degree				0.113***			
				(0.0140)			
Student income				2.13e-06***			4.02e-07**
				(1.67e-07)			(1.56e-07)
Access to $500				0.0897***			0.0544***
				(0.00603)			(0.00572)
Expected family contribution				2.28e-07***			2.10e-07***
				(8.12e-08)			(7.72e-08)

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Submitted a FAFSA					-0.0668***		-0.0276***
					(0.00754)		(0.00745)
Received Pell Grant					-0.0516***		-0.0138**
					(0.00662)		(0.00655)
Received federal work study					-0.0682***		-0.0475**
					(0.0231)		(0.0205)
Total federal work study received					1.20e-05		1.06e-05
					(8.57e-06)		(7.25e-06)
Received loans					-0.0189**		-0.00712
					(0.00751)		(0.00721)
Total loans received					-2.12e-07		-1.13e-06*
					(6.89e-07)		(6.56e-07)
Received grants					0.00193		0.00499
					(0.00768)		(0.00722)
Total grants received					-1.22e-07		4.20e-07
					(3.48e-07)		(3.47e-07)
Received any federal benefit						-0.0638***	0.000123
						(0.00485)	(0.00529)
Received federal veteran benefits						0.0689***	-0.0129
						(0.0190)	(0.0181)
Received athletic scholarship						-0.0166	-0.0204
						(0.0195)	(0.0189)

	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates
Constant	0.236*** (0.0203)	0.116*** (0.000821)	-0.0345 (0.0246)	-0.0197** (0.00900)	0.237*** (0.00778)	0.147*** (0.00528)	0.120*** (0.0336)
Observations	80,690	80,690	80,690	80,690	80,690	80,690	80,690
Adjusted R-squared	0.144	0.065	0.086	0.089	0.077	0.069	0.163

Notes: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors are in parentheses.

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Table A5. The relationship between financial knowledge and basic needs insecurity

	No covariates	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates	Matching all covariates
Answered all three financial knowledge question correctly	-0.0981*** (0.00540)	-0.0585*** (0.00601)	-0.0788*** (0.00575)	-0.0674*** (0.00589)	-0.0484*** (0.00568)	-0.0615*** (0.00559)	-0.0710*** (0.00571)	-0.0321*** (0.00599)	-0.0293*** (0.00366)
Female		-0.00400 (0.00516)						-0.0125** (0.00498)	-0.00682** (0.00338)
Genderqueer		0.0733*** (0.0246)						0.0583** (0.0233)	0.0783*** (0.0156)
Age of student		0.000980** (0.000451)						0.00187*** (0.000452)	0.00162*** (0.000296)
Not U.S. citizen		-0.0318** (0.0130)						-0.0335*** (0.0125)	-0.0395*** (0.00878)

	No covariates	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates	Matching all covariates
Married		0.110***						0.0688***	0.0636***
		(0.00987)						(0.00933)	(0.00643)
First-generation college student		0.0651***						0.0301**	0.0454***
		(0.00602)						(0.0144)	(0.00961)
American Indian/ Alaska Native student		0.0648*						0.0405	0.0908***
		(0.0369)						(0.0362)	(0.0219)
Asian student		0.00369						-0.00891	-0.00436
		(0.00984)						(0.00939)	(0.00670)
Black student		0.117***						0.0584***	0.0621***
		(0.00991)						(0.00957)	(0.00697)
Foreign student		0.0428**						0.0792***	0.0944***
		(0.0196)						(0.0196)	(0.0130)
Latinx student		0.0298***						-0.000957	8.10e-05
		(0.00813)						(0.00793)	(0.00552)
Native Hawaiian/ Pacific Islander student		0.145***						0.100***	0.0467*
		(0.0402)						(0.0369)	(0.0255)
Multiracial student		0.0801***						0.0594***	0.0487***
		(0.0121)						(0.0119)	(0.00774)
Heterosexual		-0.0989***						-0.0872***	-0.0802***
		(0.00812)						(0.00780)	(0.00483)

	No covariates	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates	Matching all covariates
Student parent with dependent child		0.0707*** (0.00856)						0.0268*** (0.00816)	0.0219*** (0.00649)
Took remedial course			0.0476*** (0.00917)					0.0212** (0.00889)	0.0304*** (0.00621)
Business major				-0.0125* (0.00740)				0.00285 (0.00677)	0.000706 (0.00443)
Degree seeking				0.0589*** (0.0170)				0.0194 (0.0166)	0.0216* (0.0119)
Second-year undergraduate student				-0.0197*** (0.00656)				-0.0109* (0.00622)	-0.00219 (0.00422)
Third-year undergraduate students				-0.0149 (0.00963)				-0.00909 (0.00915)	0.00437 (0.00558)
Fourth- or fifth-year undergraduate student				-0.0221*** (0.00766)				-0.00614 (0.00773)	-0.00101 (0.00531)
Unclassified undergraduate student				-0.0658*** (0.0166)				0.00681 (0.0164)	0.000300 (0.0108)
College GPA				-0.0646*** (0.00437)				-0.0399*** (0.00415)	-0.0407*** (0.00291)

	No covariates	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates	Matching all covariates
Parent education: High school degree					-0.00781 (0.0112)			-0.00871 (0.0112)	-0.0257*** (0.00830)
Parent education: Vocational degree					0.00441 (0.0152)			0.00739 (0.0151)	-0.0174 (0.0106)
Parent education: Associate degree					-0.0206 (0.0135)			-0.0165 (0.0133)	-0.0342*** (0.00947)
Parent education: Some college					-0.0140 (0.0117)			-0.0128 (0.0119)	-0.0241*** (0.00856)
Parent education: Bachelor's degree					-0.0610*** (0.0106)			-0.0101 (0.0105)	-0.00113 (0.00635)
Parent education: Master's degree					-0.0586*** (0.0115)			-0.00345 (0.0108)	0.00859 (0.00657)
Parent education: Doctoral degree					-0.0645*** (0.0144)				-
Student income					-8.26e-07*** (1.03e-07)			-3.84e-07*** (1.08e-07)	-2.88e-07** (1.21e-07)
Access to $500					-0.232*** (0.00738)			-0.199*** (0.00723)	-0.196*** (0.00562)
Expected family contribution					-6.4e-1*** (6.42e-08)			-2.9e-07*** (4.97e-08)	-2.47e-07*** (4.03e-08)

	No covariates	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates	Matching all covariates
Submitted a FAFSA						0.0310***		0.0275***	0.0179***
						(0.00721)		(0.00710)	(0.00474)
Received Pell Grant						0.107***		0.0452***	0.0436***
						(0.00681)		(0.00687)	(0.00492)
Received federal work study						-0.0254		-0.0236	0.00171
						(0.0226)		(0.0216)	(0.0163)
Total federal work study received						8.29e-06		8.34e-06	7.03e-06
						(8.18e-06)		(7.72e-06)	(6.15e-06)
Received loans						0.0688***		0.0496***	0.0470***
						(0.00817)		(0.00789)	(0.00526)
Total loans received						1.26e-06*		1.77e-06***	1.42e-06***
						(7.14e-07)		(6.81e-07)	(4.08e-07)
Received grants						-0.0141**		-0.00537	-0.00671
						(0.00717)		(0.00669)	(0.00449)
Total grants received						-3.53e-08		-1.30e-08	3.34e-09
						(3.54e-07)		(3.20e-07)	(2.07e-07)
Received any federal benefit							0.112***	0.0473***	0.0454***
							(0.00576)	(0.00605)	(0.00408)
Received federal veteran benefits							-0.0184	0.00516	0.0137
							(0.0170)	(0.0165)	(0.0103)
Received athletic scholarship							-0.000166	0.00845	0.00232
							(0.0200)	(0.0191)	(0.0122)

	No covariates	Demographics	HS academics	College experiences	Wealth	Aid	Benefits	All covariates	Matching all covariates
Constant	0.288*** (0.00371)	0.120*** (0.0239)	0.286*** (0.00115)	0.460*** (0.0226)	0.515*** (0.0113)	0.125*** (0.00753)	0.230*** (0.00584)	0.359*** (0.0355)	0.419*** (0.147)
Observations	80,690	80,690	80,690	80,690	80,690	80,690	80,690	80,690	65240
Adjusted R-squared	0.009	0.073	0.046	0.057	0.096	0.070	0.060	0.128	0.114

Note: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors are in parentheses. All models included an institution level fixed effect. The reference group for categorical variables are 1st year undergraduate for student year, white for student race/ethnicity, male for gender, and students whose parents did not graduate from high school for the highest level of parental education variable. The federal benefit variable indicates if the student or someone in the student's household received any of the follow benefits in the 2019–20 school year: supplemental nutrition assistance program (SNAP), free/reduced price lunch for a child in their household, supplemental security income, Temporary Assistance for Needy Families (TANF), or Supplemental Nutritional Program for Women, Infants, and Children (WIC).

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Table A6. Treatment and control matched groups balance table

	N Treatment	Adj Mean Treatment	SD Treatment	N control	Mean Control	SD control	Hedges G	D-Cox
Male	16280	0.32	0.5	48960	0.32	0.47	N/A	0
First Generation	16280	0.58	0.49	48960	0.58	0.49	N/A	0
Black	16280	0.13	0.26	48960	0.13	0.33	N/A	0
Latinx	16280	0.24	0.35	48960	0.24	0.43	N/A	0
White	16280	0.5	0.48	48960	0.5	0.5	N/A	0

	N Treatment	Adj Mean Treatment	SD Treatment	N control	Mean Control	SD control	Hedges G	D-Cox
Attend a public 2-year institution	16280	0.36	0.45	48960	0.36	0.48	N/A	0
Attend a public 4-year institution	16280	0.31	0.49	48960	0.31	0.46	N/A	0
Attend a private-non-profit institution	16280	0.15	0.27	48960	0.15	0.35	N/A	0
Attend a private-for-profit institution	16280	0.17	0.42	48960	0.17	0.38	N/A	0
GPA	16280	3.3	0.59	48960	3.28	0.59	0.03	N/A
Freshman undergraduate student	16280	0.43	0.47	48960	0.43	0.49	N/A	0
Business Major	16280	0.08	0.37	48960	0.08	0.27	N/A	0
Degree Seeking	16280	0.99	0.15	48960	0.99	0.1	N/A	0
Student Income	16280	12647.35	23506.59	48960	9468.15	17050.7	0.17	N/A
In a household that receives some kind of federal benefit	16280	0.43	0.46	48960	0.43	0.5	N/A	0
fin500_bin	16280	0.84	0.29	48960	0.84	0.37	N/A	0
Pell recipient	16280	0.48	0.46	48960	0.48	0.5	N/A	0
Filled out the FAFSA	16280	0.8	0.47	48960	0.8	0.4	N/A	0

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).

Table A7. Rate of experiencing basic needs insecurity by student racial/ethnic groups moderated by financial knowledge

	Percent experiencing basic needs insecurity in public two-year colleges	Percent Difference	Percent experiencing basic needs insecurity in public four-year colleges	Percent difference
AIAN students who DID get all three financial questions correct	37%	<1%		
AIAN students who DID NOT get all three financial questions correct	37%			
Asian students who DID get all three financial questions correct	20%	9%***	18%	6%**
Asian students who DID NOT get all three financial questions correct	29%		23%	
Black students who DID get all three financial questions correct	30%	4%	29%	<1%
Black students who DID NOT get all three financial questions correct	34%		29%	
Latinx students who DID get all three financial questions correct	23%	4%*	20%	4%**
Latinx students who DID NOT get all three financial questions correct	27%		24%	

	Percent experiencing basic needs insecurity in public two-year colleges	Percent Difference	Percent experiencing basic needs insecurity in public four-year colleges	Percent difference
NHPI students who DID get all three financial questions correct	42%	<1%		
NHPI students who DID NOT get all three financial questions correct	42%			
Multiracial students who DID get all three financial questions correct	27%	5%	24%	11%***
Multiracial students who DID NOT get all three financial questions correct	32%		35%	
White students who DID get all three financial questions correct	23%	2%	22%	3%***
White students who DID NOT get all three financial questions correct	25%		25%	

Notes: *** p<0.01, ** p<0.05, * p<0.1. AIAN = American Indian/Alaska Native. NHPI = Native Hawaiian/ Pacific Islander. We did not include results for NHPI and AIAN at four-year institutions because of small sample sizes. The percentages in the second column are the predictive margins of basic needs insecurity for every student race/ethnicity. Then the third column shows the marginal effects which test whether the predictive margins (i.e., percent who experience basic needs insecurity) **and get the question correct** are statistically significantly different from the predictive margins for not getting the questions correct for each of the six student **races/ethnicities.** Thus, this table compares the rate of experiencing basic needs insecurity between people who share the same racial category and attend the same institution type (public two-year or public four-year) but who had different financial knowledge (0 vs. 1).

Source: U.S. Department of Education, National Center for Education Statistics, 2019–20 National Postsecondary Student Aid Study (NPSAS:20).